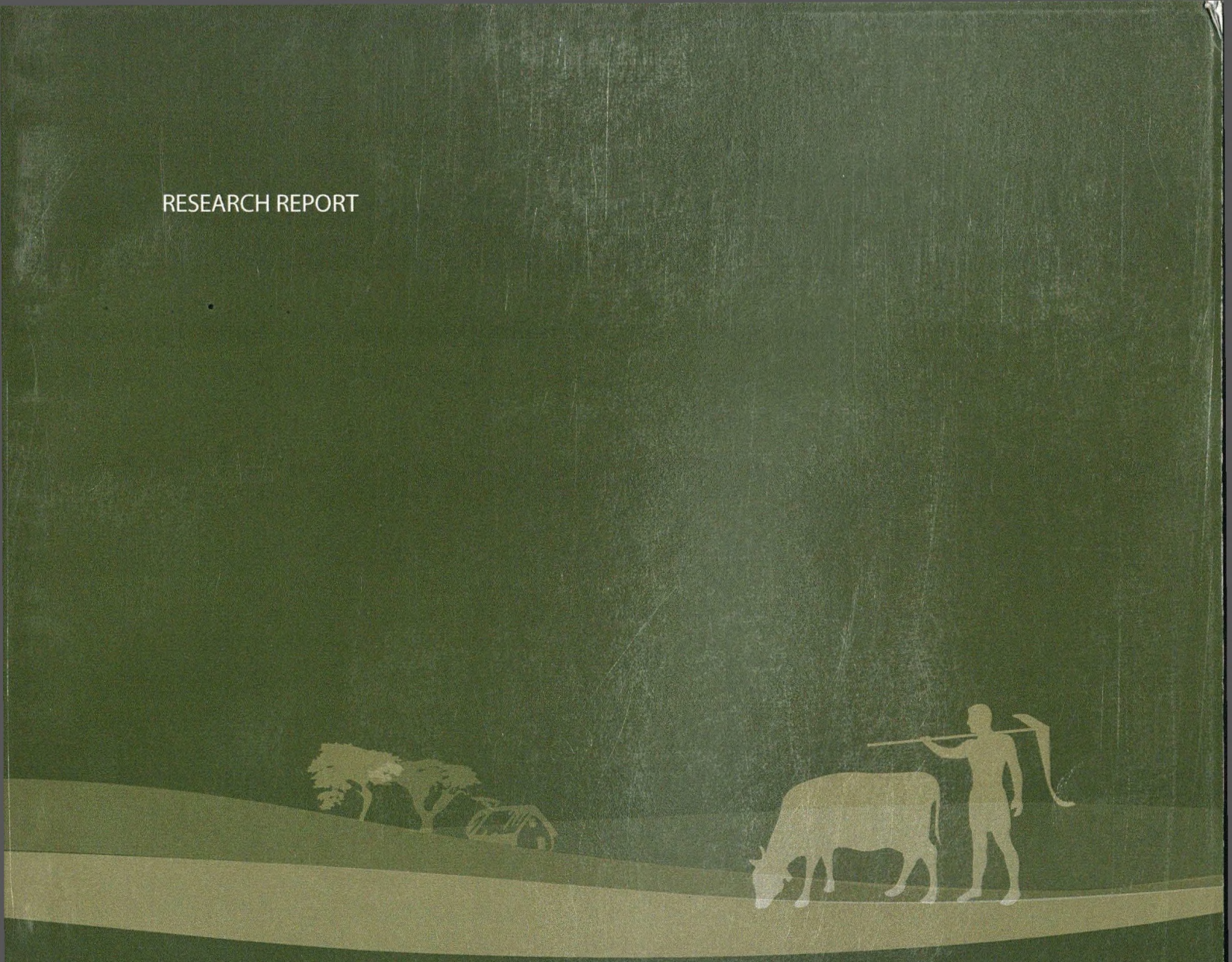
RESEARCH REPORT



CAUSES AND EFFECTS OF PADDY LAND FILLING IN WESTERN PROVINCE

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Causes and Effects of Paddy Land Filling in Western Province

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FOREWORD

The Western Province is the most populous, industrialised and developed province in Sri Lanka. Land becomes the limited and important resource in the province and the value of the land has increased. At present, rice production in the lowlands of the Western Province is stagnant due to various factors such as irrigation problems, labour shortage, low profit, high cost of production, less productivity, availability of other income activities and the lack of farmer interest. Paddy lands in the province have been abandoned for last 15 - 20 years and not been utilised for productive purposes and owners try to fill these lands illegally due to the rising high land values in the province. However maintaining the traditional lowlands has been problematic due to frequent floods that occurred devastating the economic and the social life of the people.

In this context, the study on causes and effects of paddy land filling in the Western Province was conducted with the aim of finding out the reasons of paddy land filling and its impacts on the socio-economic condition of the paddy farmers.

The study reveals that the majority of paddy land filling have occurred illegally and the most significant factor for paddy land filling is the higher demand for the highlands for residents and for the business places due to increasing population. Illegal filling of paddy lands and other common lowland disrupt the irrigation channels and further hinder the paddy farming. Agrarian service centres in the respective area are responsible for the legal action regarding the land filling in the country. Taking legal action on these illegal fillings has become life threatening because this illegal filling process involved different power relations such as political influence, corruption and thuggery.

I believe the research findings of this report will benefit policymakers, environmentalists, planners, agriculturists, research students and other interest groups.

Haputhanthri Dharmasena
Director

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The success of the entire study was owing to the information provided by the paddy farmers and Agriculture Research and Production Assistants (ARPA) in the study areas. The research team is extremely grateful to them and the officials of Agrarian Service Centers for sharing their experiences and spending their valuable time in this study.

H M J K Herath

EXECUTIVE SUMMARY

Paddy lands are important for different purposes such as for paddy production, water retention, and natural drainage. However, farmers face different issues in paddy cultivation such as irrigation issues, labour shortage, and low profit. Thus, there is an increasing trend in abandoning of cultivable paddy lands. After 5-10 years of abandonment of paddy lands, people tend to fill those lands and allocate those for alternative purposes. The situation leads to a reduction of cultivable paddy lands in Sri Lanka and it is more acute in the Western Province of the country where rapid urbanization is occurring. The study examines reasons for paddy land filling, emerging issues and socio-economic impact of it. The study was conducted in Gampaha, Kalutara and Colombo districts and GIS technique was used to identify the locations. Data was collected from a sample survey of given number of the filled paddy lands and officers attached to Agrarian Service Center. Data was analyzed using SPSS software.

According to the findings, a greater part of cases on paddy land fillings (71%) are related to abandoning lands while 18.3% accounts for reserves/Owita/Deniya. Approximately 92% of filled paddy lands in the sample were not cultivated for 10 or over 10 years. And also the majority of filled paddy lands were cultivated under rain-fed irrigation system. People do paddy land filling due to the increasing demand for highlands (70%), abandoning of land in long-run (33%), employment transition from agriculture to another field (58%) etc. People use those filled paddy lands mainly to construct buildings (64%) and cultivate highland crops (19%). However 10% people could not use those filled lands due to legal issues. The majority of cases of paddy land filling (85%) were done ill-legally. About 77.7% of them had even not sought of the Agrarian Service Center (ASC) and the rest 22.3% resorted to illegal filling after their request to ASC was rejected. On average it takes about one year to grant permission as it is a lengthy process. People fill paddy lands in 2-3 days. Especially they do this on weekends or public holidays to evade the attention of responsible authorities. In many cases, people tend to fill lowlands close to another abandoned paddy land (40%), highland (38%), irrigation canal (18%) and the main road (44%). About 64% of cases related to paddy land filling are obstructions to irrigation canals. This situation has caused floods in the area. The majority of the cases (52%) in paddy land filling were stopped by ARPAs by advising the owners. However about 38% of the cases were pending legal action and 5% were stopped by an order of Police. In many cases the court decision was to stop further filling/construction (56%) while 44% were ordered to remove the soil and restore the paddy lands. In general, ARPAs or ASCs are reluctant to grant permission for paddy land filling except for an unavoidable reason. If they issue permission that based on the reasons that, (i) No other land owned by the individual- 40%, (ii) paddy cannot be grown in those lands - 25% and (iii) that land is a highland in nature (20%). About 20% of officers said they cannot take action against illegal filling of paddy lands due to political interference. When ARPAs act against such an illegal case they have to face serious implications such as coercion/forced to drop the case (56%), assault (2%), criticism in public

(19%), deplore of official duties (27%) and loss of goodwill with villagers (30%). According to the majority of officers (50%) is no one helped in such a case. Even they have to bear the cost associated (travelling, photocopies etc) with the cases other than the litigation chargers.

Officers at ASCs (15%) suggest to take swift action to cultivate abandoned paddy lands to stop further paddy land filling. They also seek acceptance at police when they make an entry against illegal filling (11.1%) and measures to ensure their security (7.9%).

In general, a substantial number of ARPAs (43%) are extremely opposed to paddy land filling. But they said permission should be granted only for the cases with justifiable reasons and such move should not obstruct irrigation canals. However, it should be done carefully. They mentioned that rules and regulations in Paddy Land Act should be strengthened further (24%) while ensuring secure environment for the officers to carry out their duty independently (16%).

The recommendations are: the government needs to take immediate and practically reliable action to re-cultivate abandoned paddy lands to stop further filling of those lands, alternative rules and regulations should be incorporated into the Paddy Land Act to address paddy lands where farming is not viable. Further, officers face various issues when they act against illegal paddy land fillings. Therefore, establishment of a separate unit to take prompt action against those filing cases are noteworthy and it should be controlled through the Agrarian Development Department.

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ABBREVIATIONS

ADD	Agrarian Development Department
ARPA	Agriculture Research and Production Assistants
CEA	Central Environmental Authority
ETM	Enhanced Thematic Mapper
GIS	Geographic Information System
GPS	Global Positioning System
RS	Remote Sensing
SLLRDC	Sri Lanka Land Reclamation and Development Corporation
TM	Thematic Mapper
UDA	Urban Development Authority
USGS	United States Geological Survey
UTM	Universal Transverse Mercator Coordinating System

CHAPTER ONE

Background of the Study

1.1 Introduction

Sri Lanka is an island located in the northern Indian Ocean. It has an overwhelmingly agriculture-dependent economy. The country's land becomes a major resource for agriculture activities and that is vital for socio-economic development and poverty reduction. While the role of agriculture in the economy has long been prioritized and emphasized, the sector is characterized by multiple land tenure, farming practices, traditional production systems and extensive of household labour. The means of modernizing this crucial sector is a land reform that consolidates land security and gives farmers more responsibility in managing natural resources (http://en wikipedia.org/wiki/Sri_Lanka).

In an agriculture-based economy, land plays a central role in the formulation of development policies that aim at increasing the nation's income and improving people's living standards. There exists an observation that in many economic theories, which attempt to address the success of nations in raising their incomes over time. The dichotomy of 'landlessness' and 'having-access-to-land' is treated comprehensively, while the distribution of land among economic agents with access-to-land has received less attention (Erickson and Vollrath, 2007).

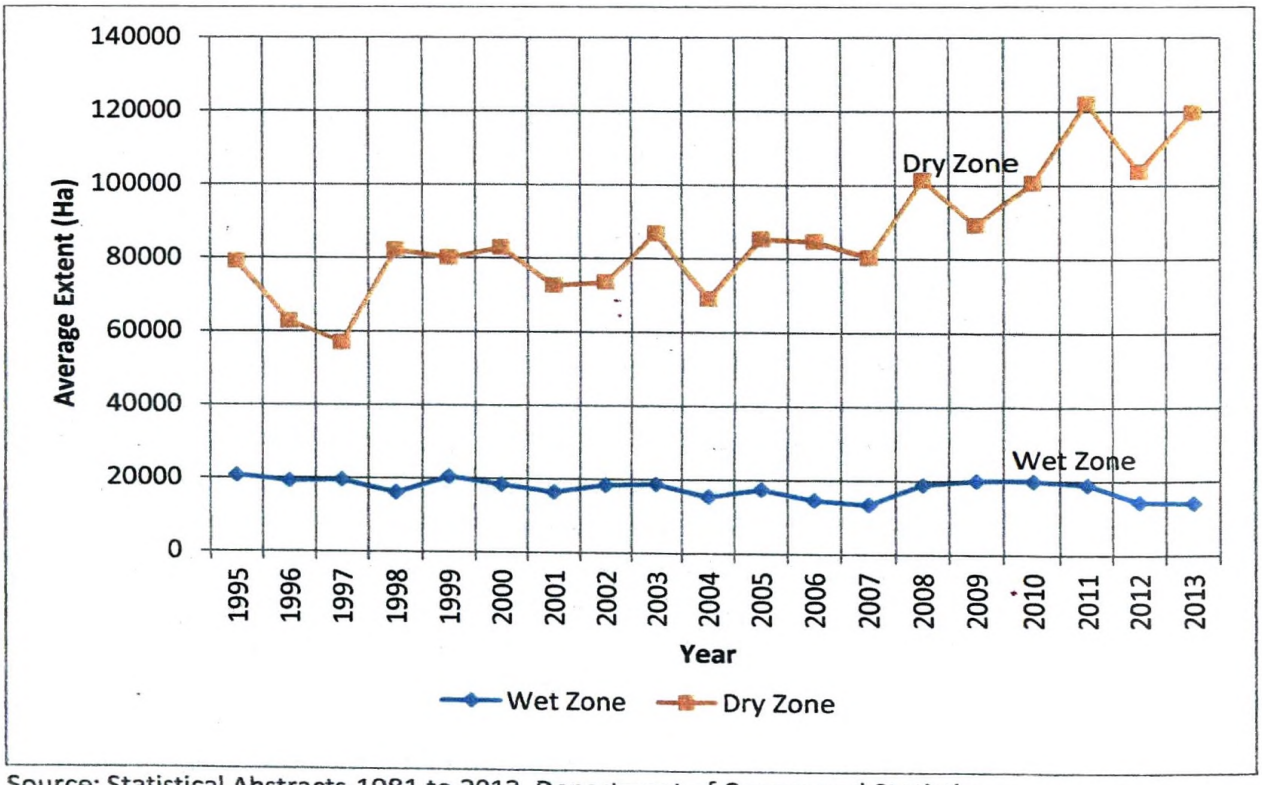
Paddy lands play a vital role in multifaceted activities such as paddy production, income generation of farm households, food security, maintaining the drainage system as well as environmental protection. Concerning the importance of paddy lands in food production, national food security and environmental sustainability, the government has enacted rules and regulations to protect paddy lands. Even though with these rules and regulations, the extent of filled paddy lands has increased over the years by influencing to decline the cultivated area under rice. Wet Zone faces this problem seriously. Especially this situation can be identified in urban and semi-urban areas. Most of the paddy land are filled illegally and the Western Province is one of the provinces which seriously facing this problem with or without permission for land filling. This is clearly visible in certain regions, such as the coastal parts of the Western province in the proximity of the Colombo - Katunayake and Colombo - Matara highways or connected to industrial estates and free trade zones. Gradual but vast occupational land-use changes due to urbanization are taking place, changing socio-economic living conditions. With the known circumstances of a humid, tropical climate and high annual rainfall, introduction of urban land-uses naturally has a considerable environmental impact, above all on hydrological cycles. Not only the natural drainage patterns and surface water run-off change, there is an increased amount of wastewater from households and industry and solid waste logging canals.

At public forums, many argue that severe floods, a host of environmental issues and problems related to paddy land cultivation such as disturbance to cultivating other paddy tracts in the same field are emerging as a consequence of paddy land filling. According to Kedaragama and Bandara (n.d) the cultivated paddy land area has been declining significantly in wet zone districts of Colombo, Kalutara, Gampaha, Galle, Kegalle and Kurunegala over the years. One of the major reasons for that is paddy land filling in that area.

Since this situation makes many problems and issues related to food production, environment as well as the national economy it is important to study why people tend to fill the paddy lands and the effects and impacts of paddy land filling on society and the economy.

1.2 Effects of Paddy Land Filling on Rice Cultivation

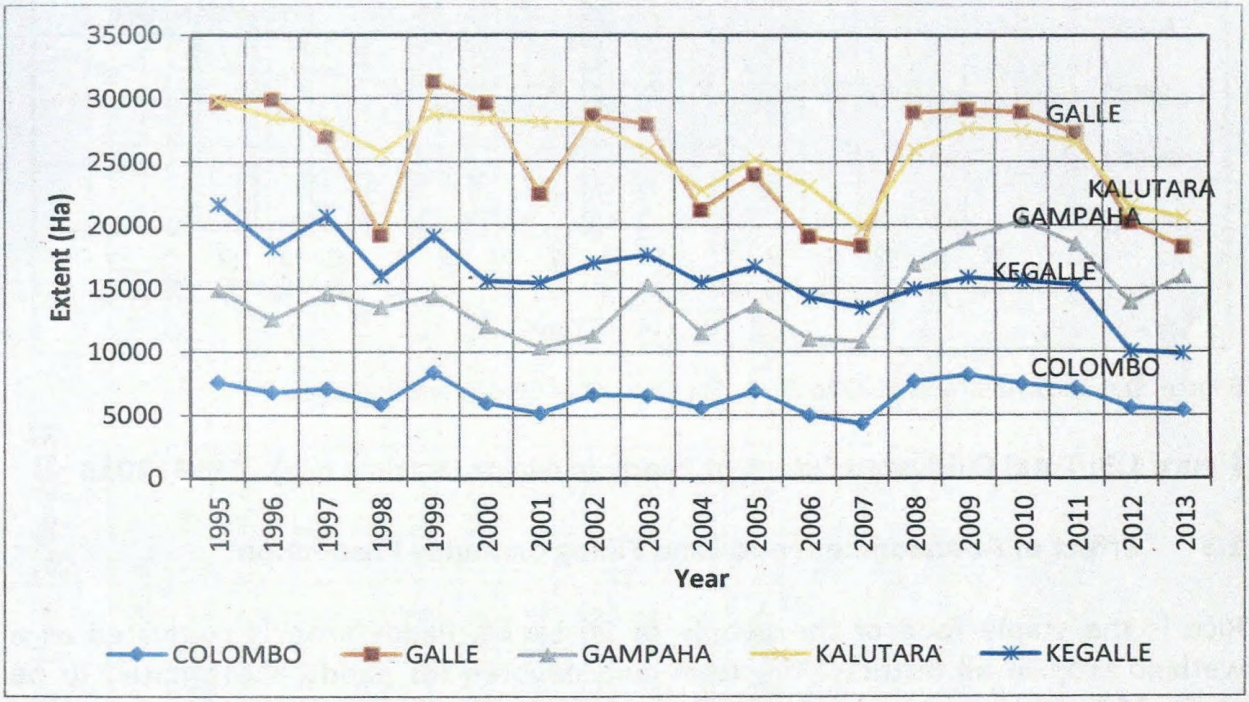
Figure 1 shows the extent of paddy cultivation in *yala* and *maha* seasons during the period of 1995 to 2013 in two major climatic regions, dry and wet zones. It shows that there is an increasing trend of cultivating paddy land extent in the dry zone and a gradually decreasing trend in the wet zone. The decreasing trend in the wet zone indicated that there is an increase in the extent of paddy lands which were not utilized for rice farming. This under utilization results in more pronounced land use changes in the wet zone than in the dry zone.



Source: Statistical Abstracts-1981 to 2013, Department of Census and Statistics

Figure 1.1: Extent of Cultivated Paddy Land in Selected Districts of Wet Zone and Dry Zone (Ha) (1995 - 2013)

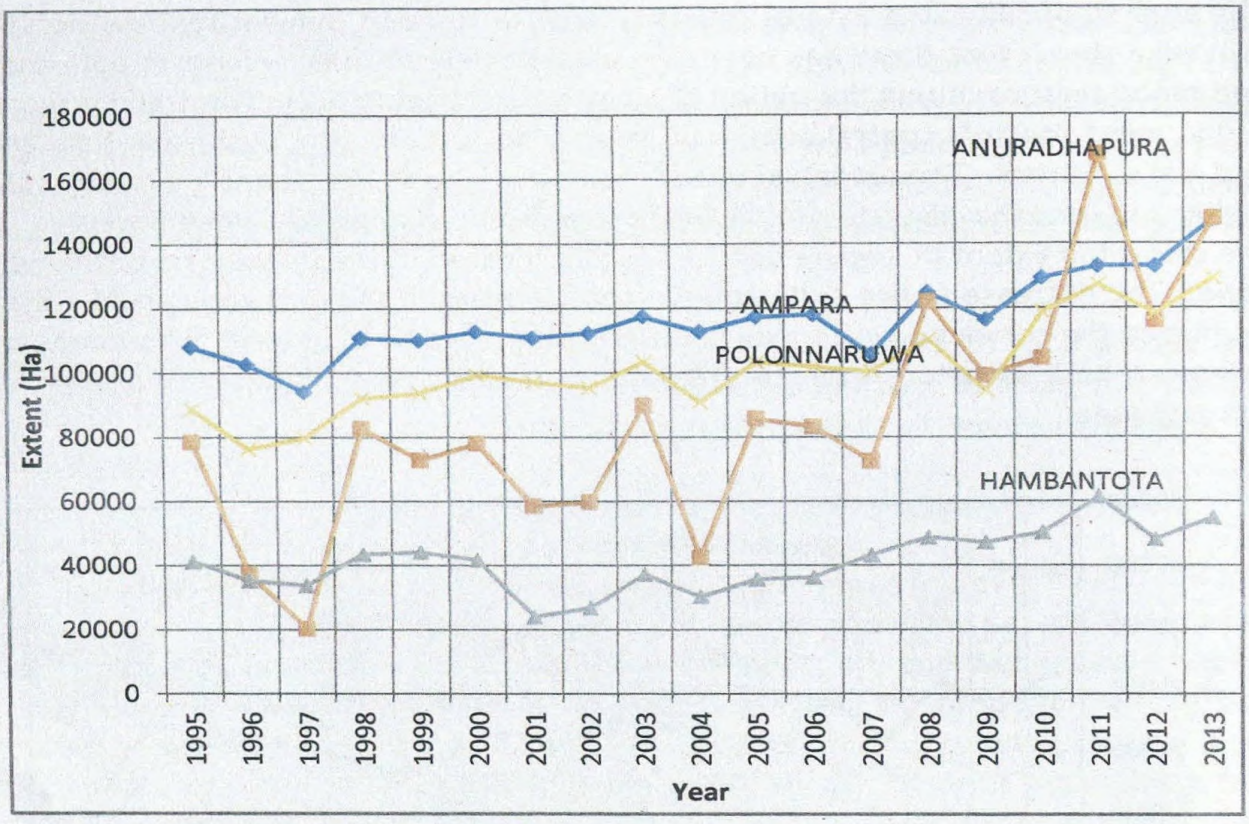
The analysis of cultivated extents of paddy lands in some of the wet zone districts in Sri Lanka shows that there has been a gradual decline in their extents in both yala and *maha* seasons during the period of investigation (Figure 1.2). This trend is more pronounced towards coastal suburban areas such as Colombo, Gampaha, Kalutara and Galle districts. The extent of abandoned paddy lands was found be remarkably higher in Gampaha district. However, no significant change has been observed in the cultivated extent in Kegalle district which is located in the inland part of the wet zone. The decrease in rice cultivation in coastal areas in the wet zone could either be due to the conversion of paddy lands for other uses or long-term abandonment. However, both situations have contributed to the reduction of paddy cultivation in the wet zone.



Source: Statistical Abstracts-1981 to 2013, Department of Census and Statistics.

Figure 1.2: Total Cultivated Extent of Paddy in Wet Zone Districts (Ha) (1995 - 2013)

The analysis of the extents of paddy lands in some of the dry zone districts like Ampara, Anuradhapura, Hambantota, and Polonnaruwa shows that there is an increasing trend in the cultivated extent in both yala and *maha* seasons during the period of investigation (Figure 1.3). It is mainly due to bring of new lands under rice cultivation with the launching of major irrigation schemes like the Mahaweli Development Program during this period. In the Anuradhapura district, a wide fluctuation in the cultivated extent has been observed. It could possibly be due to the dependency of a greater portion of paddy lands on rainfall pattern. This situation is highly evident under minor irrigation systems where paddy is cultivated in cascade systems in the district. In the other districts namely Ampara, Hambantota and Polonnaruwa paddy cultivation mainly depends on major supplementary irrigation facilities and as such a fluctuation does not occur in the extent annually cultivated with rice.



Source: Statistical Abstracts-1981 to 2013, Department of Census and Statistics.

Figure 1.3: Total Cultivated Extent of Paddy in Major Districts (Ha) - 1995–2013

1.3 Effect of Abandonment and Land Filling on Paddy Production

Rice is the staple food of the people of Sri Lanka. Paddy crop is cultivated as a wetland crop in all districts. The total land devoted for paddy is estimated to be about 708,000 Hectares at present. There are two cultivation seasons namely; *Maha* and *Yala* which are synonymous with two monsoons. *Maha* Season falls during "North-east monsoon" from September to March and *Yala* season is effective during the period from April to the end of August. When paddy crop is sown and harvested during above periods, the particular season is defined. However, the whole area devoted for paddy is not being cultivated due to a number of reasons such as water scarcity during cultivating seasons, prevailing unsettle conditions on the ground etc (Department of Census and Statistics, Sri Lanka, 2014).

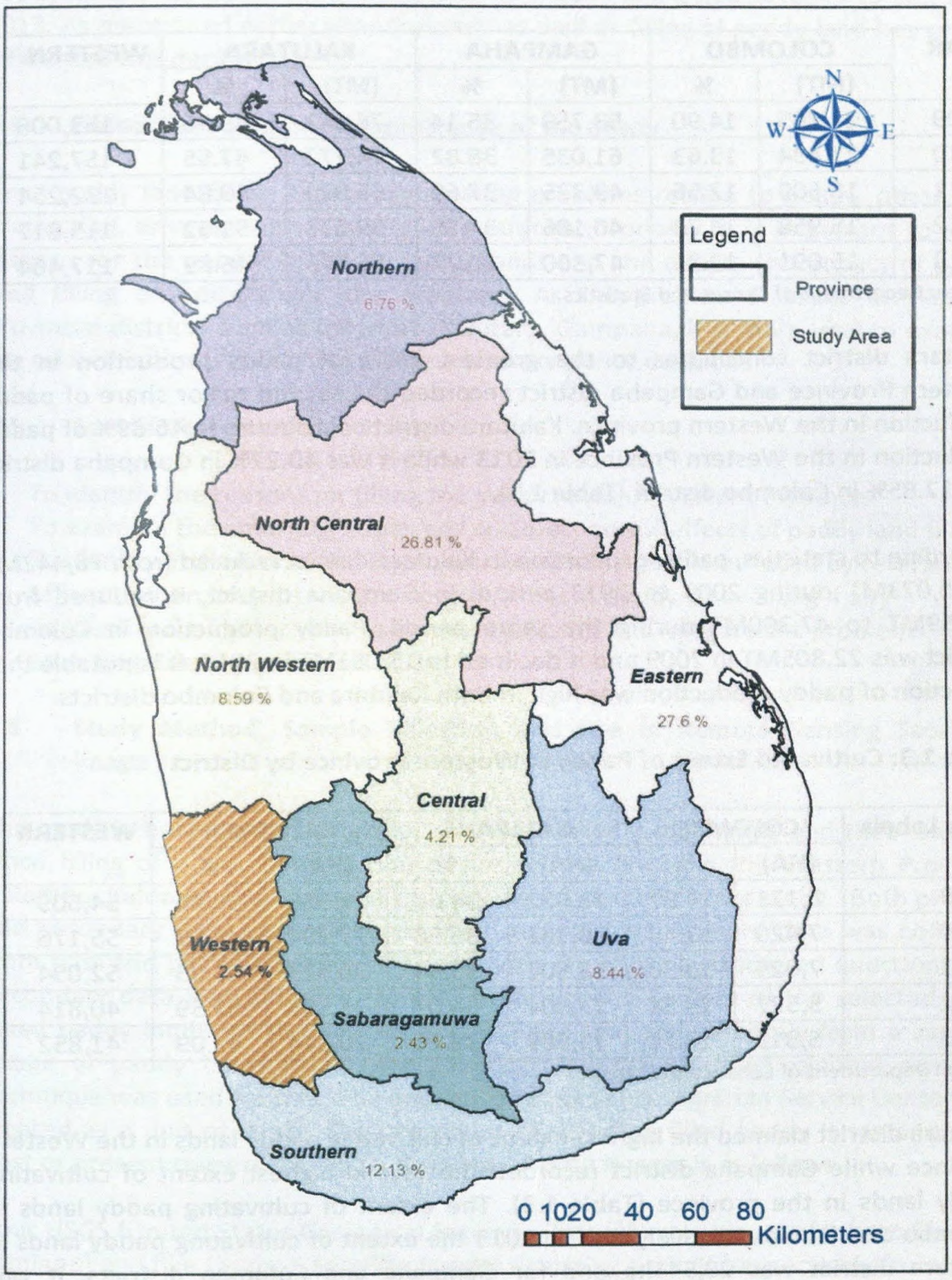
Table 1.1: Cultivated Extent of Paddy by Province (2009-2013)

PROVINCE	2009		2010		2011		2012		2013	
	(HA)	%	(HA)	%	(HA)	%	(HA)	%	(HA)	%
Central	57,572	05.89	63,541	05.96	62,017	05.07	50,298	04.72	58,187	04.79
Eastern	216,148	22.12	244,523	22.95	262,752	21.48	262,366	24.60	299,179	24.65
North Central	224,378	22.96	263,799	24.76	312,204	25.52	270,533	25.36	314,425	25.90
Northern	20,485	02.10	28,136	02.64	82,003	06.70	80,484	07.55	97,966	08.07
North Western	161,145	16.49	150,431	14.12	187,656	15.34	123,660	11.59	174,393	14.37
Sabaragamuwa	40,769	04.17	40,501	03.80	43,565	03.56	32,676	03.06	22,404	01.85
Southern	131,776	13.49	138,108	12.96	133,766	10.93	121,105	11.35	123,987	10.22
Uva	70,263	07.19	81,064	07.61	87,376	07.14	84,681	07.94	81,370	06.70
Western	54,609	05.59	55,176	05.18	52,054	04.25	40,814	03.83	41,852	03.45
ALL	**977,145**	**100**	**1,065,281**	**100**	**1,223,393**	**100**	**1,066,617**	**100**	**1,213,763**	**100**

Source: Department of Census and Statistics

According to the statistics, it is notable that the total cultivated extent of paddy in Sri Lanka is slightly fluctuating annually. Irrigation issues, drought, other climatic changes and filling of paddy land may cause this situation. In the Western province, cultivated extent of paddy was decreased from 55,176ha to 52,054ha (by 5.66%) from 2010 to 2011. It recorded a 40,814ha of paddy cultivated area during 2012 and it was a 21.59% reduction of paddy lands compared to 2011. However in 2013 there was a slight increase in the cultivated extent of paddy in the Western Province and it recorded as 41,852ha (2.54% increase). Different programmes implemented by Agrarian Service Centers to re-cultivate abandoned paddy lands may lead to that. It is also notable that the percentage of the cultivated extent to total paddy lands in the Western province is gradually decreasing from 5.59% in 2009 to 3.45% in 2013.

In general, the contribution to country's total paddy production in all provinces gradually decreased in the recent past except the Northern Province. The North Central Province, Eastern Province, North Western and Southern Provinces employed the highest shares of national level paddy production. Accordingly Figure 4 depicts the provincial contribution to the total paddy production from 2009 to 2013. Accordingly average paddy production contribution percentage of the Western province at the national level was recorded as 2.54%. Paddy production in the Western Province shows a gradual decline where it recorded 153,006 MT production in 2009 but during 2013, it was 117,464 MT. Reduction of cultivated paddy land may have resulted in this declining trend in paddy production. Table 1.2 shows total paddy production in the province during the period of 2009 to 2013.



Data Source: Department of Census and Statistics.

Figure 1.4: Average Percentage of Paddy Production Contribution by Province (2009-2013)

Table 1.2: Paddy Production in Western Province by District (2009-2013)

YEAR	COLOMBO		GAMPAHA		KALUTARA		WESTERN
	(MT)	%	(MT)	%	(MT)	%	
2009	22,805	14.90	53,759	35.14	76,442	49.96	153,006
2010	21,434	13.63	61,035	38.82	74,772	47.55	157,241
2011	16,609	12.56	49,725	37.60	65,920	49.84	132,254
2012	15,958	13.78	40,186	34.70	59,673	51.52	115,817
2013	15,091	12.85	47,300	40.27	55,073	46.89	117,464

Source: Department of Census and Statistics

Kalutara district contributes to the greatest share of paddy production in the Western Province and Gampaha district recorded the second major share of paddy production in the Western province. Kalutara district contributed to 46.89% of paddy production in the Western Province in 2013 while it was 40.27% in Gampaha district and 12.85% in Colombo district (Table 1.2).

According to statistics, paddy production in Kalutara district reduced from 76,442MT to 55,073MT during 2009 to 2013 period. In Gampaha district, it reduced from 53,759MT to 47,300MT during the same period. Paddy production in Colombo district was 22,805MT in 2009 and it declined to 15,091MT in 2013. It is notable that reduction of paddy production was high in both Kalutara and Colombo districts.

Table 1.3: Cultivated Extent of Paddy in Western Province by District

Row Labels	COLOMBO		GAMPAHA		KALUTARA		WESTERN
	(HA)	%	(HA)	%	(HA)	%	
2009	8,121	14.87	18,932	34.67	27,556	50.46	54,609
2010	7,420	13.45	20,362	36.90	27,394	49.65	55,176
2011	7,029	13.50	18,502	35.54	26,523	50.95	52,054
2012	5,527	13.54	13,904	34.07	21,383	52.39	40,814
2013	5,319	12.71	15,989	38.20	20,544	49.09	41,852

Source: Department of Census and Statistics

Kalutara district claimed the highest extent of cultivating paddy lands in the Western Province while Gampaha district recorded the second highest extent of cultivating paddy lands in the province (Table 1.3). The extent of cultivating paddy lands in Colombo district was relatively low. In 2013 the extent of cultivating paddy lands in Kalutara district was 20,544ha and for Gampaha and Colombo districts, it was 15,989ha and 5,319ha respectively. The extent of cultivating paddy lands in Kalutara district in the Western province was 49.09% in 2013 and for Gampaha and Colombo districts, it was 38.20% and 12.71% respectively.

Reduction in cultivated paddy lands from 2009 to 2013 was high in Colombo districts than in the other two districts in the Western province. The percentage of cultivated

paddy lands in Colombo district was 14.87% in 2009 and it had declined to 12.71% in 2013. As mentioned earlier abandonment as well as filling of paddy land has greatly influenced this decline.

1.4 Research Problem and Significance of the Study

Since paddy land filling apparently creating problems related to paddy, other food production, environment as well as the national economy, it is important to study reasons for the people to fill the paddy lands and the effects and impact of paddy land filling on society and the economy. As the problem is acute in Western Provincial districts such as Colombo, Kalutara, Gampaha, it is more vital to examine the related issues within these districts to make policy decisions.

1.5 Specific Research Objectives;

i. To identify the reasons for filling the paddy lands in Western Province
ii. To examine the emerging issues and socio-economic effects of paddy land filling
iii. To identify institutional and legal weaknesses and problems faced by relevant officers, when they attempt to control/prevent paddy lands filling if any
iv. To identify the better ways to handle the issues and mitigate the problems emerging due to paddy land filling

1.6 Study Method, Sample Selection and Use of Remote Sensing Satellites Image

The study is based on an empirical survey on filled paddy lands and their owners. Since filling of paddy lands is one of the serious issues in the Western Province, Colombo, Kalutara and Gampaha districts were selected for the study. Both primary and secondary data were gathered from each district. Primary data was collected from past and present owners of filled paddy lands using structured questionnaire. Secondary data was gathered from Agrarian Service Centers of the selected area. Filled paddy lands for the primary survey were selected randomly from a satellite image of paddy lands in all three districts and the stratified random sampling technique was used for that. The area under a particular Agrarian Service Center was treated as a unit of strata. The procedure of selecting filled paddy lands and their past or present owners for the study using satellite images is as follows.

Four USGS (United States Geological Survey) (http://www.usgs.gov/pubprod/aerial.htmland) and five Landsat **Satellite Images** spanning periods, respectively from 2005 *Yala* to 2005 *Maha* and 2013 *Yala* to 2013 *Maha* were collected for atmospheric attenuation, converted to radiance and temperature values, and geo-referenced to a common UTM map base (Figure 5). The USGS images were made to match the full TM scenes, encompassing a 90=100-km2 region near the Western Province Sri Lanka. A smaller area of interest was selected to correspond to Gampaha, Colombo, and Kalutara located in the Western Province in Sri Lanka. *Yala* and *Maha* seasons were selected since they are subject to the least variability due to changing

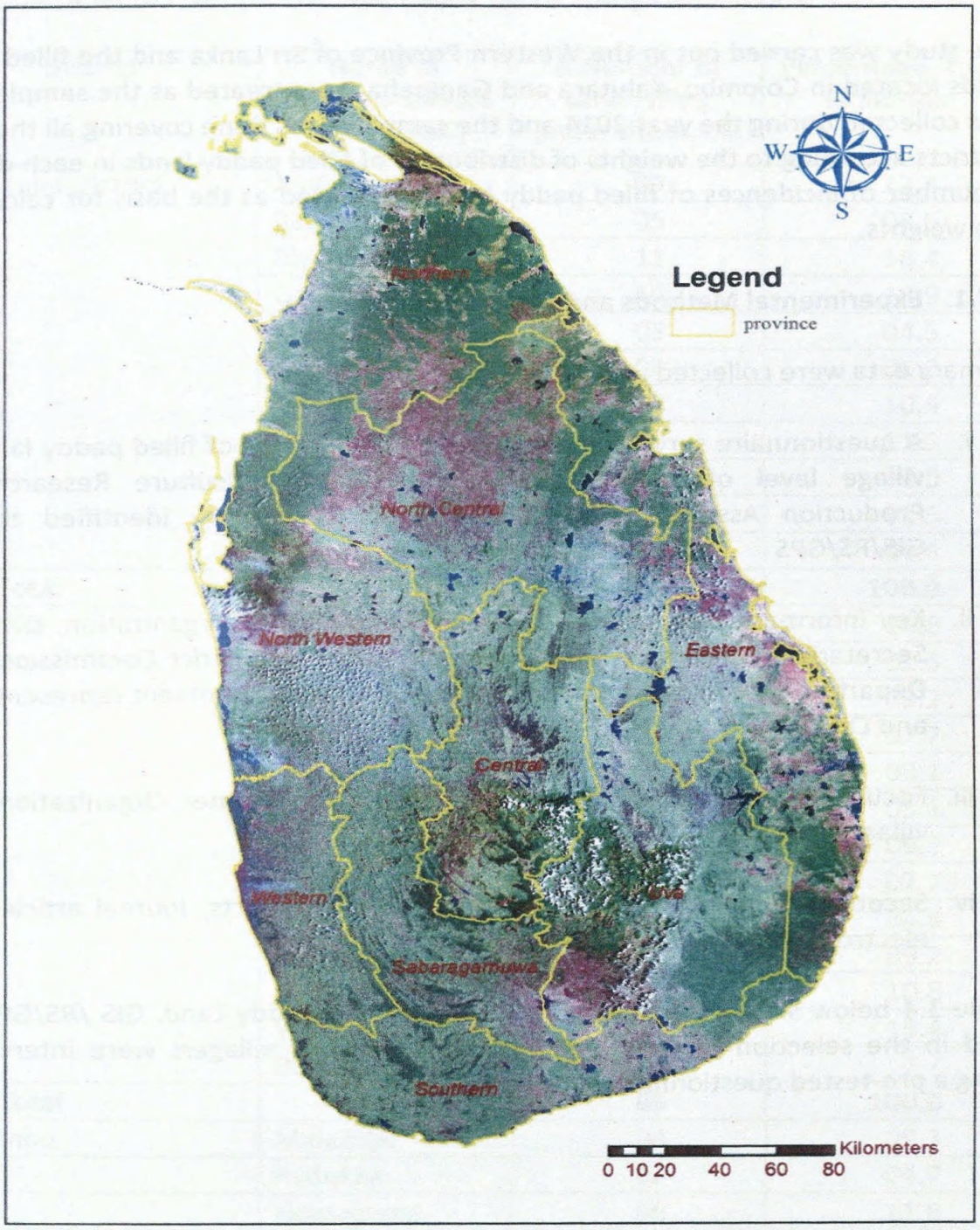
meteorological conditions and because they permit a better distinction between paddy and urban or built-up land than *Yala* and *Maha* seasons.

The USGS and TM images were resembled from resolutions of approximately 1.1 km and 28.5 m to 1km and 25 square meters, respectively. TM images were classified according to several basic land surface types. Although the classification process was capable of reasonably separating four land classes, the final analysis consolidated these into four Anderson et al., 1972 Level 1 land cover : Categories: urban or built-up land, forested land, agricultural land including pasture and bare land and water. Statistics performed on classified images for Western Province showed a progressive increase in urban or built-up land occurring largely at the expense of abandon paddy land, whereas cultivated paddy area decreased only slightly during the nine years. This slight decrease in paddy field area was primarily due to the loss of land in and around new housing developments, rather than to the loss of land illegal or legal filling designated as paddy land.

We incorporated the time of protection as the number of years since a pixel belongs to a protected area or zero otherwise. Farmers and other land users make their land management decisions based on objectives, constraints, and the potentials of their households and individual members. At the Agrarian Development Department level, we observed the aggregate behaviour of all land users and other stakeholders in land allocation and management. Ideally, to integrate grid-based data with survey data, the scale of the analysis was matched the unit of decision-making. This renders spatial modelling a time-consuming and costly task due to the necessary delineation of the spatial extent of plots or villages, e.g. using global positioning systems (GPS).

The geographic positions of all Agrarian Development Centre level were recorded with GPS and point coverages were created. Agrarian Development Centre level boundaries for all surveyed villages were then defined using paddy land polygons which were constructed so that each location within a polygon is closer to all its contained points than to any other point in the layer (Aronoff, 1995).

These polygons were then used as a base unit for Agrarian Development Centre level data in sub-sequent analyses. Hence, survey data apart from population takes the value of the interviewed village for each point, which is closer to the village's centroid than to any other centroid. The vast areas of virtually unused and remote paddy land were implicitly integrated via geophysical indicators such as topography, soil quality, and slope as well as distance to major roads, which all render land used unprofitable on these marginal lands and should therefore not distort results considerably. In this study, the unit of analysis was a pixel. The research area was spatially referenced to pixels with a size of 50 m x 50 m. Each pixel, therefore, represented an area of a quarter of a hectare. After re-sampling all spatially available information to above grid size, data was stored as surfaces in a raster GIS.



Source: USGS landsat satellite image

Figure 1.5: USGS /UTM Land Sat Image Sri Lanka 2013

Although sampling was done by focusing on filled paddy lands, the randomly selected paddy land owners have either cultivating or abandoned paddy lands along with that filled paddy land. Therefore information on either cultivating or abandoned paddy lands owned by them is (such as reasons for abandoning, issues in cultivation) also gathered from the primary survey.

1.7 Method of Data Collection

The study was carried out in the Western Province of Sri Lanka and the filled paddy lands located in Colombo, Kalutara and Gampaha were treated as the sample. Data was collected during the year 2014 and the sampling was done covering all the three districts according to the weights of distribution of filled paddy lands in each district. A number of incidences of filled paddy lands were used as the basis for calculating the weights.

1.7.1 Experimental Methods and Techniques:

Primary data were collected using following methods.

i. A questionnaire survey on previous/present owners of filled paddy land and village level officers, Grama Niladhari and Agriculture Research and Production Assistants. The filled paddy lands were identified through GIS/RS/GPS

ii. Key informant discussions (Leaders of the Farmer Organization, Divisional Secretaries, Officers of Environmental Authority, District Commissioners of Department of Agrarian Development and Local Government representatives and Officers)

iii. Focus group discussion with members of the Farmer Organizations and villagers.

iv. Secondary data were collected using relevant reports, Journal articles, and electronic media.

Table 1.4 below shows the selected sample of filled paddy Land. GIS /RS/GPS was used in the selection process and accordingly, 175 of villagers were interviewed using a pre-tested questionnaire.

Table 1.4: Selected Sample of Filled Paddy Lands Using GIS/RS/GPS

District	Name of Agrarian Service Center (ASC)	A Number of Land Filling under the A.S.C.	Percentage Tags of Sample
Gampaha District	Andiambalama	09	13.4
	Badalgama	05	07.5
	Biyagama	11	16.4
	Galahitiyawa	10	14.9
	Kelaniya	03	04.5
	Minuwangoda	04	06.0
	Nittambuwa	07	10.4
	Pallewela	08	11.9
	Pasyala	06	09.0
	Udugampola	01	01.5
	Yakkala	03	04.5
Sub Total		**67**	**100.0**
Kalutara	Panadura	07	10.8
	Horana	01	01.5
	Ingiriya	06	09.2
	Matugama	05	07.7
	Warakagoda	02	03.1
	Madurawala	02	03.1
	Baduraliya	06	09.2
	Nagoda	05	07.7
	Angalawaththa	03	04.6
	Moronthuduwa	06	09.2
	Dodamgoda	07	10.8
	Walagedara	10	15.4
	Bulathsinghala	05	7.7
Sub Total		**65**	**100.0**
Colombo	Malambe	04	09.3
	Padukka	02	04.7
	Homagama	05	11.6
	Maharagama	02	04.7
	Kesbewa	10	23.3
	Kotte	08	18.6
	Kolonnawa	08	18.6
	Kosgama	04	09.3
Sub Total		**43**	**100**
Total		**175**	

***** *GIS/ Geographic Information System.*

***** *RS/ Remote Sensing*

***** *GPS/ Global Positioning Systems*

1.7.2 Selection Method of Officers for Questionnaire Survey

At the first stage, 30% of the Agrarian Development Centers were selected from Colombo, Kalutara, Gampaha districts after a key informant discussion with Deputy/Assistant Commissioners of Agrarian Development in the relevant districts.

At the second stage, 50% of the Agriculture Research and Production Assistants (ARPAs) were selected randomly. Accordingly 63 ARPAs at Agrarian Service Centers were interviewed.

1.8 Data Analysis

i. Quantitative data was analyzed by using simple statistical methods such as graphs and tables. To analyze data, Arc GIS, SPSS, software were used.

ii. Qualitative data was analyzed by synthesizing.

CHAPTER TWO

Review of Literature

2.1 Introduction

This chapter describes the literature related to the study. The first section illustrates the botanical background of the paddy crop, its agronomic requirements and the status of paddy cultivation in Sri Lanka. The next section explains the importance of paddy cultivation in Sri Lanka. The following sections explain the importance of wetlands and their ecological value. The last section of the chapter presents information on land market and the procedure of paddy land fillings.

2.2 Rice is Life

Rice is more than just a food for 3 billion people in the world whose staple food is rice. Grown in Asia for at least 10,000 years, rice has become deeply embedded in the cultural heritage of Asian societies and it has been incorporated into their lives in many other aspects; religion and beliefs, culture and tradition, politics and business. Many religious rituals are tied to the rice cycle, and social and cultural behaviour is tied to rice production. In remote villages of South-east Asia, farmers still compare a grain of rice to "a grain of gold". In modern Japan, people see rice as the very heart of their culture. Rice cultivation has changed landscapes and cuisine and provided farmers with new sources of income. It has become the most rapidly growing source of food in Africa and it is significant importance to food security in an increasing number of low-income food-deficit countries. It is for all these reasons that in 2002, the United Nations General Assembly took the unprecedented step of declaring 2004 as the International Year of Rice with "Rice is Life" as the theme, reflecting the importance of rice as a primary food source.

Rice was first cultivated in ancient China and India. From China rice growing was brought to neighbouring countries in East and South-east Asia, while from India it spread to southern Europe and Africa. From its Asian homeland, rice is now cultivated in 113 countries and on all continents except Antarctica. It is often grown in paddy fields ie. fields with small boundary earth bunds to maintain a shallow water depth (typically from 100 to 200 mm depth) as the plant itself is an aquatic plant capable of "breathing" through its hollow stem. The main reason for flooding the rice fields is that most rice varieties maintain better growth and produce higher yields when grown in flooded soils than grown in dry soils. The standing water layer provides for water storage to withstand the vagaries of weather, helps to suppress weeds and allows for breeding of fish and ducks. Such a paddy system facilities increased productivity, although rice can also be grown on dry land (including on terraced hillsides). Rice cultivation is well suited to poor countries as it can grow fairly well even with rudimentary or no water infrastructure. About 80 percent of the world's rice is grown by small-scale farmers in low-income and developing countries

where rice-based production systems and their associated post-harvest operations employ nearly 1,000 million people in the rural areas. Only about 5 percent of the world's production is exported with Thailand exporting 5.3 million tonnes a year, Vietnam 3.3 million and the United States 2.3 million tonnes (Borlaug, 2000). Efficient and productive rice-based systems can lead to economic development and improved quality of life, particularly in rural areas, as well as help in the efforts to eradicate hunger and malnutrition (Food and Agriculture Organization, 2012).

2.3 Importance of Paddy in Sri Lanka

Paddy is the single most important subsistence agricultural product which occupies 34 percent of the total cultivated area in Sri Lanka (Abeysiriwardene et al, 2000). Although the demand for rice is increasing, cultivated paddy lands are diminishing at a rapid pace (Dhanapala and Dissanayake, 2005). In Sri Lanka, the most prominent factor behind the reduction of paddy cultivated areas is the abandonment of paddy lands. This abandonment/fallowing of paddy lands is even more apparent in semi-urban areas of the wet zone in Sri Lanka. The main reason behind this abandoning/fallowing of paddy lands is the deviation of farmers from agriculture to other livelihoods. This is taking place as agriculture, and especially paddy farming is becoming an unviable occupation due to many socio-economic changes taking place especially in the semi-urban areas of the country. Although many incentives are granted by the Sri Lankan Government to uplift paddy cultivation in the country, abandoning of paddy lands are on the increase in many semi-urban areas of the country. According to the data gathered by the Biyagama Divisional Secretariat, there are approximately 900 acres of abandoned paddy lands (2012) in the Biyagama D.S. division of the Gampaha district, where the main primary research was conducted (Perera and Vidanagama, 2013).

2.4 Paddy Land as Wetlands

In view of the large percentage of wetlands in the Western Province and due to the lack of infrastructure serving all highland available for development, in certain cases land filling for development purposes has to be permitted with conditions. This could include the use of wetlands for carefully planned and implemented public infrastructure projects such as highway development, solid waste management projects and sewage disposal projects, where appropriate land is not available.

Nevertheless, it is recognized that most of the wetlands should be conserved and some preserved in order to ensure that the expected urban development in the province is sustainable. This is crucially important in view of flood disaster prevention considering the tropical monsoon climate of the region and its vulnerability to the south-west, north-east as well as inter-monsoonal rains. Future increased extreme storm events are to be expected following climate change (Perera and Vidanagama, 2013)

2.5 Paddy Land and Importance

Approximately 20% of lands in the Western Province are composed of wetlands and the wetlands in the Western Province could be classified as follows:

i. Deep freshwater marshes and swamps
ii. Shallow freshwater marsh including some abandoned clay pits and similar abandoned mining areas.
iii. Recently abandoned paddy fields
iv. Paddy fields
v. Other wetland agriculture areas such as reed/rush fields, low-lying grasslands (often used as grazing grounds) "Keera-Kola" (green leaf) fields & certain "ovita" (hedges) areas
vi. Water bodies (such as estuaries, lagoons, lakes and some abandoned clay pits) and waterways, including sea-grass beds.
vii. Mangrove areas.

(Urban Development Authority of Sri Lanka, 2006).

The goal of wetland zoning in the Western Province is to facilitate environmentally and economically sustainable use of wetlands considering their intrinsic potential, their ecology and the needs of the surrounding population, while maintaining essential flood storage capacity and other environmental benefits. These guidelines should be applied to all Urban Local Authority areas in the Western Province (Urban Development Authority of Sri Lanka, 2006).

2.6 Wetland Series of Workshops

The Urban Development Authority and interagency along with the Ministry of Environment, all other related government and non-government agencies have identified 5 basic zones of wetlands:

i. Wetland Protection Zone.
ii. Wetland Nature Conservation Zone.
iii. Wetland Agriculture Zone.
iv. Special Paddy Cultivation Zone.
v. Low-lying Potential Development Zone

(Urban Development Authority,2006)

2.7. Environmental Role of Paddy Land

2.7.1 Groundwater Recharge

In many parts of rural Asia, few roads have been constructed, and water transport, utilizing rivers, canals and drains remain the most important means of travel at the local level. In large-scale paddy irrigation schemes, the main and secondary canals frequently perform the function of serving as arterial transportation networks.

In many parts of Asia, flood irrigation is practised for paddy fields, providing some level of insurance in terms of water supply as well as for weed control purposes. Under this system, paddy field is usually filled with a water depth of 100 to 150 mm and this standing water is maintained until prior to harvesting. Some water percolates through the heavy soils and moves into the ground as groundwater recharge. Most of the percolated water flows back into the rivers and drains and are an important source of water for irrigation reuse or recycling. As estimated 7 percent goes towards recharging the underground aquifers and this will be an important source of groundwater recharge in the future when dependence on groundwater supply is expected to increase on par with surface water increases.

2.7.2 Water Purification

Apart from solar energy, paddy fields can also help as a purification zone for nitrogen discharged from other sources. Observations have shown that 80-90 percent of NO_3-N in irrigation was removed when contaminated water passed through the paddy field over a rice cultivation period. Nitrogen is the most important nutrient for rice, and its deficiency is common unless nitrogen is available from sources other than the soil organic matter. In lowland rice, 50 to 80% of Nitrogen is absorbed by the crops from the native soil nitrogen pool.

2.7.3 Flood Control

The field bunds (betas) of paddy fields function like the dikes of flood dams and paddy fields surrounded by bands can store and regulate the discharge of heavy rainfall. For example, taking the average height of bunds as 30 cm, the water depth for growing rice as 4.5 cm, the coefficient of water permeability of paddy field as 1.5 mm/day and average duration of flood as 3 days; then the amount of water reservoir capacity calculated would be 300 mm or 3,000 cubic meters per hectare. Potentially this storage will have an appreciable effect on flooding.

2.7.4 Soil Erosion Control

Soil erosion leads to not only to the loss of soil fertility and agricultural production but also to bring sediments into the river system and causing flooding downstream. Paddy fields with its level surface and bunds can reduce the impact of rainfall on the soil surface and control erosion and help retain the soil eroded from the upland. This

suggests that the rice field has the capacity to protect against soil erosion, at least the amount of soil that is lost from the upland (Kedaragama and Bandara, (n.d)).

2.7.5 Air Cooling Effect

The standing water layer in paddy fields is important not only for the production of rice and recharging groundwater but also for the redistribution of solar energy at the surface of the earth through evapotranspiration. When water evaporates from the surfaces of rice fields and plants into the atmosphere, it takes up heat from the air, lowering the atmospheric temperature. The differences in energy balance and surface temperature among various types of land use influence the air temperature environment. Air temperature above the paddy fields is thus lower than that of the surrounding area as the fields absorbed some energy of air, contributing to the moderation of air temperature.

2.7.6 Aesthetics of Landscape and Green Lung

Paddy fields contribute to the rural landscape in many ways. During the early part of the irrigation season, the fields are little ponds of water, creating reflections which are very aesthetic and soothing to the eyes. In the middle part of the season, the fields become green verdant landscape, serving as green lungs to the nearby urban areas. When the paddy plant is in full bloom and ripening, the green landscape gives way to one of the rich golden hues. Many people, both urban and rural, enjoy these changing scenery and landscapes of paddy fields. There is now a growing market for agro-tourism which includes special trekking tours in paddy fields, introduction to paddy farming activities, and home stays with paddy farmers. These are designed to be both educational as well as holiday experiences especially for the urban population and school children. At the same time, they help to increase the incomes of the rural farmers.

2.7.7 Environmental Role

Paddy fields become part of a new environment with ecological processes that reflect the influences of both man and nature. Paddy fields act as artificial wetlands, where a certain type of aquatic ecosystem suitable for plant and animal forms, such as aquatic birds, insects and animals, including fish is maintained. The value and landscape or biodiversity depends on personal preference and culture and is called non-use value. The non-use value of paddy fields would become more precious if the bio-diversity of paddy (wetland) ecology is developed and encouraged. They can be further developed under the concepts of agro or eco-tourism.

2.8 Reasons for Land Market

2.8.1 Fresh Water

There is an abundant supply of freshwater (47.97 million km^3) per year but only a small share is available at the right time and place. For example, only a third of the 110,000 km^3 annual precipitation reaches rivers, lakes, and the aquifers, of which only 12,000 km^3 is available for irrigation, domestic and industrial use (SIWI et al 2005). Two-thirds of precipitation are absorbed as soil moisture or evaporates (Ibid). Only 0.79% of freshwater is not frozen in ice or glaciers and of that, a large share is a groundwater. Irrigation water use has tripled in the past 50 years, and irrigation accounts for 70% of global freshwater withdrawals UN-Water Annual Report (2009). One estimate – among many estimates with different volumes – of current water use for food production is 6800 km^3/year (Shiklomanov, 2000). The world population growth of 80 million per year triggers an additional annual demand of freshwater of 64km^3 (UN water 2009). It is estimated that the growing human population will require more food, which will translate into doubling demand for water for agriculture from the current level of 7,130 km^3 to 12,050 to 13,500 km^3 in 2050 (CA 2007). According to another estimate, additional water withdrawal and use equivalent to 5,600 km^3/year would be required to eliminate hunger and undernourishment and to feed the additional three billion inhabitants in 2050 (Falkenmark and Rockström, 2004), which is about three times the water used for irrigation today (Shiklomanov, 2000). Water scarcity is already evident in dry areas. Molden et al (2007) estimate that about 25% of the earth's river basins run dry before reaching the ocean due to water use. In 2000 about 2.3 billion people lived in river basins with water stress, i.e. had access to less than 1,700 m^3 per capita/year, below which, disruptive water shortages can frequently occur (Revenga, et al 2000). By 2025, Revenga et al (2000) estimated that 48% of the global population will have water stress under business as usual.

2.8.2 Urbanization

Urban areas are growing fast and increasingly occupying larger land areas. The urban population surpassed the rural population in 2008 (UN 2008; Tollefson 2011) and it is expected that by 2050, the urban population will account for 70% of the total global population (Seto and Shepherd 2009). Cities occupy less than 3% of the global land area but they account for 78% of carbon emissions, 60% of potable water use and 76% of industrial wood consumption (Grimm et al 2008). However, measurement of urban area is not well captured by current LUCC models (Nelson and Robertson 2008).

2.8.3 Infrastructure Development

Road development reduces transaction costs and increases access to natural resources. Hence, holding other factors constant, road development could lead to deforestation as observed by Nelson and Hellerstein (1997) in Central America. However, recent works have shown that such a pattern holds only in countries with weak institutions. In countries with strong institutions, road development does not affect deforestation. For example, between 1990- 2010, forest extent increased in Europe and China and has remained almost constant in North America (CBD 2010). All these countries and regions have good road infrastructure, strong institutions, and high or middle incomes. Studies have shown that access to road, electricity and communication infrastructure is strongly correlated with agricultural total factor productivity (Foster and Briceno-Garmendia 2010). This means that poor road infrastructure could lead to low agricultural productivity, which in turn could lead to the conversion of forest and other natural ecosystems to agriculture. However, poor road infrastructure could also hamper the cutting of forests for timber. For example, in Central Africa, the relatively low rate of deforestation is correlated with weak infrastructures. The SSA region has poor road infrastructure, which has contributed to low agricultural productivity, which in turn has led to the conversion of virgin land to agriculture. A large infrastructure deficit as compared to other developing countries contributed to the smallest contribution of yield increase to agricultural production in 1961-2005 and to the fastest decline of per capita arable land.

2.8.4 Population Growth

Population has been the major driver of agricultural expansion (Foley et al., 2011; Bruinsma, 2009). Even though the positive correlation between population growth and cropland is expected due to increasing demand for food, it is also true that people tend to settle in areas suitable for agriculture (Ibid). Technological development and international trade have weakened the relationship between population and expansion as well as a settlement in areas of arable land (Ibid). For example, the Green Revolution in Asia led to a much slower area expansion than would have been the case without the productivity improvement. Borlaug (2000) estimates that if cereal yields of 1950 had been unchanged through 2000, a total of 1.8 billion ha of land would have been converted to cropland to meet the cereal demand in the world. Instead, crop yield increases accounted for 77% growth in agricultural production between 1961 and 2005 in Asia. Expansion into arable land accounted for only 14% of growth.

Paddy Lands Asweddumized and Abandoned

Definitions

Lands prepared for paddy cultivation through the construction of bunds to control the water flow are, irrespective of the season for cultivation, classified as *asweddumized paddy lands.* Aswedduma in Sinhala means "cultivation". Cultivation of other crops (such as vegetables or tobacco) may occur temporarily. The rate of utilisation is approximately 80 % in the Maha season and 30-40 % in the Yala season.

With a cultivation gap of more than five years, the land is defined as *abandoned paddy lands.* If the abandoned paddy land is again cultivated it falls under the category of asweddumized paddy lands. Thus, all lands considered as abandoned have not been consecutively cultivated for the last five years *(Nanayakkara , 1999).*

CHAPTER THREE

Reasons for Filling of Paddy Lands in Western Province

3.1 Introduction

First, the chapter describes the status of paddy cultivation in the Western province, Sri Lanka, and the issues in farming. Secondly, the chapter shows alternative uses of those lands and major reasons for abandoning of paddy lands. The third section describes the status of paddy land filled, major reasons, its trend, uses, and consequences of paddy land fillings. The fourth section explains the legal aspects of paddy land fillings in the Western Province.

3.2 Extent, Cultivation Status and the Issues of Paddy Farming in Western Province

Paddy lands in the Western Province can be categorized into four types as follows based on their current uses.

Table 3.1: Composition of Different Types of Paddy Lands Available in Western Province

Paddy Land Type	Percentage to Total Extent (%)
Cultivating paddy land	26
Currently not cultivating	06
Abandon paddy lands	31
Filled paddy lands	37
Total	100

Source: Primary Survey Data, 2014

According to the primary survey statistics, major extent of paddy lands in the Western province is filled and it accounts for 37 percent of total paddy lands in the area. Another 31 percent of paddy land extent in the province remains as abundant lands which were not cultivated for about 5 years or more. The percentage of cultivating paddy land extent in the Western province is about 26. Currently not cultivating paddy land extent (not cultivated period is less than 5 years) accounts 6 percent of total paddy land extent in the Western province.

The results suggest that major area of paddy lands available in the Western Province were filled and another major share of paddy land extent is abundant at present. It indicates paddy cultivation in the area faces greater risk. Table 3.2 below shows the average extent of paddy lands available for a farmer under different categories.

Table 3.2: Average Extent of Paddy Lands per Farmer under Different Categories

Paddy Land Type	Average Extent (Perches)	Maximum Extent (Perches)	S.D. (Perches)
Cultivating paddy land	43	640	107.8
Currently not cultivating	09	320	41.9
Abandoned paddy lands	51	820	157.9
Filled paddy lands	61	800	120.9

Source: Primary Survey Data, 2014

The average size of cultivating paddy land owned by an individual farmer in the Western Province is 43 perches. The maximum extent of cultivating paddy land in the province records as 640 perches. The average size of an abandoned paddy land in the Western Province is 51 perches. The maximum extent of abandoned paddy land in the province records as 820 perches. On average, the extent of paddy lands which are not being cultivated at present and abandoned for less than 5 years is nine perches while it records the maximum extent as 320 perches. The average size of filled paddy land owned by a respondent in the sample is 61 perches and it records a maximum of 800 perches.

The analysis shows that the average size of both filled and abandoned paddy lands are greater than the mean value of cultivating extent in the area.

Table 3.3 depicts the distribution of cultivating paddy lands among the farmers of Colombo, Kalutara and Gampaha district. Accordingly 76 percent of respondents in Gampaha district do not own cultivating paddy lands currently. Their paddy lands were either filled or abandoned or currently not being cultivated. For Kalutara and Colombo districts, it is 69 and 91 percent respectively.

Table 3.3: Distribution of Cultivating Paddy Lands among the Farmers of Three Districts

Category of Cultivating Land Extent	Gampaha		Kalutara		Colombo	
	Number of Respondents	Percentage	Number of Respondents	Percentage	Number of Respondents	Percentage
Not owned cultivating paddy land	51	76	45	69	39	91
less than 10 perches	01	02	00	00	00	00
21-30	01	02	00	00	02	05
31-40	01	02	00	00	00	00
41-50	00	00	01	02	00	00
51-100	05	07	03	04	00	00
Greater than 100	08	11	16	25	02	04
Total	67	100	65	100	43	100

Source: Primary Survey Data, 2014

The analysis shows that only 24 percent of respondents in Gampaha district own currently cultivating paddy lands while it is 31 percent and 9 percent for Kalutara and Colombo districts respectively. In Gampaha district, about 11 percent of farmers own cultivating lands which are above 100 perches. For Kalutara district, it is 25 percent and for Colombo, the percentage value is 4 percent. Thus, large-scale paddy farmers are highest in Kalutara district while it is lowest in Colombo district.

3.3 Issues in Paddy Farming in Western Province

There is a decreasing trend in the cultivating paddy land extent in the area. Farmers in the Western Province are abandoning paddy cultivation due to many reasons. Table 3.4 shows the respective percentages of farmers who had faced different issues in paddy farming.

Table 3.4: Reasons for Abandoning of Paddy Lands in Western Province

Reason	Gampaha (%)	Kalutara (%)	Colombo (%)	Western Province Average (%)
High production cost	18	20	30	23
Less harvest	08	08	05	07
Irrigation issues	42	44	28	38
Labour shortage	31	21	40	31
Pest and diseases	12	08	02	07
Leptosphyrosis (rat fever)	18	08	18	15
Dispose of waste water to paddy lands	21	06	18	15
Sand and salinity in field	37	20	16	24
Moved to another job	12	02	09	08
No access way for lands	03	06	04	05
Iron toxicity	00	05	02	02
Inflow of salt/sea water	00	25	02	09

Note: Summations of percentages in each district are not equal to 100% as the respondents have given multiple answers for the question

Source: Primary Survey Data, 2014

Among the contributory factors for abandoning of paddy lands in the Western Province, irrigation issues were the major problem for farmers in the area as mentioned by 38 percent. Secondly, the major problem is labour shortage and it was mentioned by 31 percent. Sand and salinity problem in soil is also a serious issue in paddy cultivation in the Western Province, especially in Kalutara district. It was mentioned by 24 percent of farmers in the area. Seawater intrusion has been one of the serious problems in farming and paddy cultivation in the coastal belt of wet and semi-wet areas are declining especially in Galle, Kalutara, Colombo and Gampaha districts (Gangodawila, 1994). Water logging is induced by blocking of natural

drainage due to disturbances caused in the natural landscape. It has been a major problem in the south-west coastal belt in the country. It is found mainly in Gampaha, Colombo and Kalutara districts. Formation of bog and half-bog soils is the ultimate result of water logging. Rice production has been constrained on those soils due to the development of unfavorable soil characteristics.

The high cost of production was mentioned as a farming issue by 23 percent of respondents. The current cost of production of rough rice is Rs. 8.57 per kg in the country and cost of labour, farm power, and tradable inputs constitute 55 percent, 23 percent, and 23 percent respectively (Department of Agriculture, 2014). The labour cost has risen to a higher rate than other costs over the last few years due to labour shortage in the agriculture sector.

Disposal of polluted water and other substances such as chemicals to the nearby paddy fields from factories located in Malabe, Biyagama, Kalutara Nagoda, Nittabuwa free trade zones and from other small scale industries is also a severe problem for farming lands. About 15 percent of farmers in the area face this issue and it reduces paddy production of those lands. Urban areas are often littered as a consequence. Finding suitable land for disposal or central waste treatment / management facilities in the urban areas has become difficult. The problem is most severe in the densely populated areas of the Western Province. In rural areas due to lower population densities and greater availability of land, disposal of solid waste is not a serious issue. The waste generated from industrial and hospital premises comprises hazardous and non-hazardous materials. In the sample, it is the major pressing factor to deviate from paddy cultivation.

The risk of rat fever or Leptospirosis is high in wetlands of the Western Province and about 15 percent of farmers have abandoned their paddy cultivation due to that. This situation was acute in both Gampaha and Colombo districts than in Kalutara district. Farmers who work in paddy fields are prone to be affected from rat fever because of a bacterium in rat urine. The bacteria enters the body through wounds and scratches and those working in the fields must take a dose of Doxycycline capsules or tablets before entering the paddy field as a precaution. (Daily News Tuesday, March 24, 2015)

Invasion of paddy fields by large tree species, animal attacks- especially by wild boar, birds and hedgehogs make farming difficult. Individual cultivation rather than group cultivation was also another factor for farmers to deviate from paddy cultivation in the selected sample.

The geographical water table of land in Kalutara district locates below the seawater table. Therefore, seawater seeps into paddy lands and because of that marshy nature and high salinity level can be found in paddy fields in the district. This soil condition creates difficulties for paddy cultivation in Kalutara district.

Migration of labour from paddy farming, lack of road access to paddy lands and Iron toxicity are mentioned as issues in paddy farming by 8 percent, 5 percent and 2 percent of farmers respectively. Higher educational standards of the second generation have become a major reason to deviate from paddy cultivation in the selected sample. The social stigma attached to paddy farming and the reluctance of the younger generation to engage in farming activities are also vital reasons in deviating from paddy farming. Part-time farmers engage in many occupations such as working in shops, boutiques, bakeries and many business ventures, employment in the free trade zone, government and private sector employment while engaging in paddy farming.

As mentioned above, there are physical conditions unfavourable for paddy farming in the Western Province of Sri Lanka. Due to irrigation issues, sand and salinity conditions in soil, Iron toxicity, and seawater intrusion farmers got less yield and less profit from paddy farming. Thus, some of the farmers allocate those problematic paddy lands in alternative crop cultivations.

3.4 Different Crops Cultivated in Paddy Lands in Western Province

Farmers in Western Province tend to grow alternative crops in paddy lands where the land is not suitable for paddy farming. However, some of them do this purposely even though they can grow paddy in their lands as they want to earn higher profit from those lands. Farmers grow vegetables, fruits, root crops and plantation crops in paddy lands where those lands were abandoned from cultivation. People grow coconut, tea, cinnamon, ginger, banana, and vegetables as an alternative income sources in those lands. Coconut is the major alternative cultivation in lowlands of Gampaha and Kalutara districts while in Colombo it is Banana. Table 3.5 shows the average extent of cultivation for each crop cultivated in paddy lands.

Table 3.5: Average Extent of Cultivation for Alternative Crops Cultivated in Paddy Lands

Crop	Average Extent (Perches)	Maximum Extent (Perches)	Std. Deviation (Perches)
Coconut	17	800	75.1
Banana	04	200	22.3
Vegetable	03	320	27.1
Tea	1.5	120	11.3
Green leaves	01	105	10.1
Ginger	0.5	80	06.1
Rubber	0.5	80	06.1
Cinnamon	0.2	38	02.8

Source: Primary Survey Data, 2014

Accordingly coconut cultivation employed the highest average cultivation extent of paddy lands per farmer while banana and vegetable cultivation followed. The results suggest that coconut cultivation has spread in a greater extent of paddy lands in the Province where alternative crop cultivation was carried out by farmers. This is commonly observed in Kalutara district, especially in Walagedara area. High salinity level in soils due to sea water intrusion caused a reduction in paddy production of that area, however is favourable for coconut cultivation.

Today both banana and rice cultivations are important for Sri Lanka's population. Rice is the most consumed product and banana is the most consumed fruit and both crops are widely distributed in the Sri Lankan agriculture (Hirimburegama, W.K., Dias, and Hirimburegama, (2004)).

Table 3.6 shows percentages of different cultivations in lowlands of Western Province by extent. Accordingly percentage of paddy cultivating extent to total extent of paddy lands in the district is the highest in Gampaha. Coconut is the next major cultivation in paddy lands in both Gampaha and Kalutara districts. In Colombo district, banana is the major cultivation in paddy lands next to paddy.

Table 3.6: Percentages of Different Cultivations in Paddy Lands of Western Province by Extent

Crop	Gampaha (%)	Kalutara (%)	Colombo (%)	Western Province (%)
Paddy	61.49	44.86	51.72	51.15
Coconut	26.35	33.52	10.78	29.43
Banana	4.16	5.07	36.35	6.93
Green leaves	3.57	1.46	0.57	2.14
Vegetables	2.14	8.68	0.57	5.83
Cinnamon	0.00	0.65	0.00	0.38
Ginger	2.29	0.00	0.00	0.80
Tea	0.00	4.38	0.00	2.55
Rubber	0.00	1.38	0.00	0.80
Total	100.00	100.00	100.00	100.00

Source: Primary Survey Data, 2014

Respondents in Gampaha district (specially Andiambalama, Katana) used to cultivate short type coconut varieties in their paddy lands without filling those lands. According to them, they do so due to unfavourable soil conditions in those lands for paddy farming. However, they use this method as the first step in allocation of paddy lands for other uses. They can earn greater profit from such cultivations. Similarly, in Kalutara district (Specially Walakumbura ASD) coconut cultivation in paddy lands is practiced due to the seeping of salt water into paddy lands. Salinity in soil is good for coconut cultivation and landowners can earn higher profit from those lands. The most serious matter associated with this situation is that ASC does not have legal authority to remove other cultivations from paddy lands.

3.5 Abandoning of Paddy Lands from Cultivation

Unfavourable soil condition, irrigation issues, labour shortage led to abandoning of paddy lands in the Western Province. Abandoning of paddy lands in the long-run is a prime factor for paddy land filling.

3.6 Duration of Abandonment of Paddy Lands in Western Province

There are some paddy lands in the Western province, which were not used for any cultivation for a long time due to unfavourable soil condition, irrigation issues, and other reasons. The following table shows the period of abandonment of paddy lands in the Western province.

Table 3.7: Duration of Abandonment of Paddy Lands

Number of Years of Abandonment	Frequency	Percentage
less than 10 years	12	07
11-20 year	55	31
21-30 year	33	19
31-40 year	32	18
41-50 year	15	08
greater than 50 years	03	02
Total	150	85
Not abandoned /not mentioned	25	15
Total	175	100

Source: Primary Survey Data 2014

Out of the sample of filled paddy land owners 31 percent have filled their paddy lands after 11-20 years of an abandoning period. The percentage of respondents who filled paddy lands after 21-30 years of abandoning period account for 19 percent. About 18 percent of landowners have filled their paddy lands about 31-40 years of abandoning period. Filled paddy lands which have been abandoned for more than 50 years account for only about 2 percent.

3.7 Irrigation Method of Filled Paddy Lands

According to the table 3.8, majority of the filled paddy lands were cultivated using rain-fed water and it accounts for 65 percent. About 33 percent of incidences on filled lowlands were cultivated using irrigation canal while one percent by pumping water from wells. Accordingly the major irrigation method of filled paddy lands in the Western Province is rain-fed irrigation. Uncertainty and less amount of rain create ambiguity in paddy cultivation. This situation led to abandoning of paddy lands.

Main problems found in an irrigation canal network include lack of water available at the water source, high water consumption in fields close to the water source resulting in water shortages at the tail end of the scheme. Illegal manipulation of canals and structures, siltation, plant growth, water losses, frequent overtopping, and low water levels due to canal erosion are the other problems in irrigation canal network.

Table 3.8: Irrigation Method of Filled Paddy Lands

Method of Irrigation	Frequency	Percentage
Irrigation canal	56	33
Pump	02	01
Rain-fed	115	65
Other	02	01
Total	175	100

Source: Primary Survey Data, 2014

According to paddy farmers bad design or bad construction may also be the cause of sub-optimal functioning of a scheme. A canal may be too small to supply enough water to irrigate the area served by the canal, and if the discharge-needed is supplied to such a canal, it will be excessive and water will overtop. Also, the water level in a canal may have been wrongly determined, and if it is too low water may not enter the fields despite gravity. Check structures or even pumps will then be needed to supply sufficient water to the fields.

Table 3.9: Number of Years of Abandonment and the Irrigation Method of Paddy Land

Years being Abandoned	Irrigation Method			
	Irrigational Canal	Rain-fed	Other	Total
Less than 10 years	02 (04%)	10 (09%)	00 (00%)	12 (08%)
11-20 years	19 (40%)	36 (36%)	00 (00%)	55 (37%)
21-30 years	13 (28%)	19 (19%)	01 (100%)	33 (22%)
31- 40 years	09 (20%)	23 (22%)	00 (00%)	32 (21%)
41-50 years	01 (02%)	14 (14%)	00 (00%)	15 (10%)
Greater than 50 years	03 (06%)	00 (00%)	00 (00%)	03 (02%)
Total	47 (100%)	102 (100%)	01 (100%)	150 (100%)

Note: Out of 175 of individuals in the sample, only 150 farmers own abandoned paddy lands along with the filled paddy lands

Source: Primary Survey Data, 2014

According to the table 3.9, the majority of filled paddy lands were cultivated using rain-fed irrigation method. Out of 47 incidents of filled paddy lands cultivated using irrigation water, 45 instances show the period of abandonment is greater than 10 years. In other words, nearly 96 percent instances of filled paddy lands cultivated using irrigation water were paddy lands that were abandoned for over 10 years.

Similarly, about 90 percent of filled paddy lands cultivated under rain-fed water have been abandoned for over 10 years.

3.8 Paddy Land Filled in Western Province, Reasons, and Trends

Paddy land filling is taking place at a rapid pace especially in Kelaniya, Minuwangoda, Nagoda, Malambe, Gampaha and Panadura. The main reason for paddy land filling is abandoning of cultivating land in the long run due to different reasons. In some cases, people let paddy lands to be abandoned purposely and then fill it. In such cases people tend to grow various crops especially banana. In some instances people received financial aid for those cultivations under different governments and private organizations. When landowners fill the cultivating paddy lands, a soil layer was put on the land and this was done especially at night. This process can be observed in most filled paddy lands bordering the main road and close to urban areas. Rest of the farmers in that area complain that either Agrarian Service Centre or other responsible institutes turn a blind eye to this situation.

The table 3.9 shows that majority of filled paddy lands in the Western province are abandoned for a long period. It is indicated in table 3.10 which shows the status of the paddy lands when they were filled.

Table 3.10: Status of Paddy Lands when They were Filled

Type of Filled Paddy Land	Frequency	Percentage
Cultivating land	11	06
Currently not cultivated	09	05
Abandoned	123	71
Reservation/Owita/Deniya	32	18
Total	175	100

Source: Primary Survey Data, 2014

The results in above table also suggest that nearly 71 percent of filled lands are abandoned lands while 18 percent accounts for reservation/Owita/Deniya. People tend to fill abandoned paddy lands since those lands remain unproductive in the long run and they can earn a greater profit by allocating those lands for some other purposes.

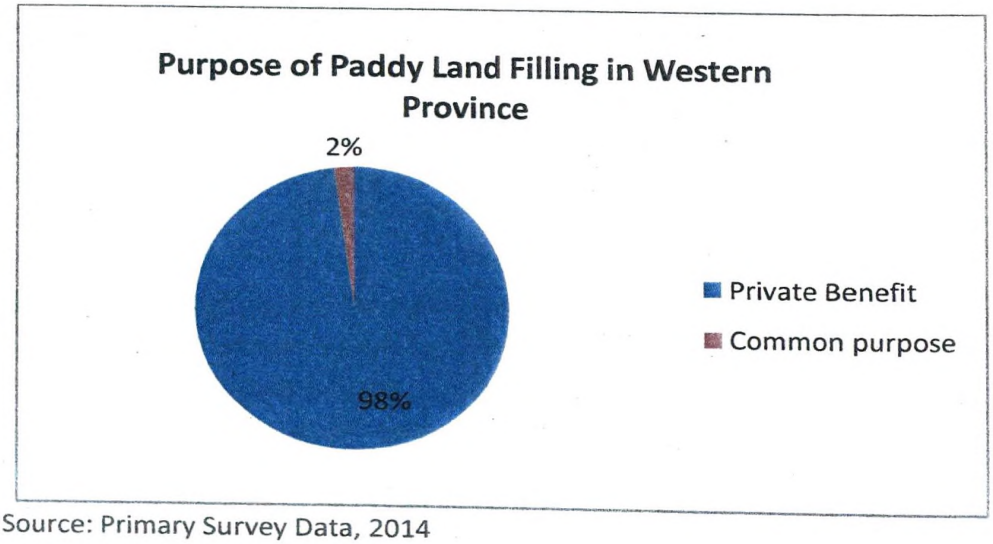
Table 3.11: Reasons for Paddy Land Filling

Reason	District			Western Province Average (%)
	Gampaha (%)	Kalutara (%)	Colombo (%)	
Less profit from paddy farming	16	09	07	11
The land left abandoned for a long time	28	37	33	33
Due to implementation of development project	06	09	07	07
Irrigation canals being blocked due to highways	04	03	02	03
Increased demand for highlands	70	64	77	70
Employment transition from agriculture to another employment	55	55	68	58
Consequences due to other lowlands that are filled	09	08	05	07

Note: Summation of percentages in each district is not equal to 100% as the respondents have given multiple answers for the question

Source: Primary Survey Data, 2014

About 98 percent of paddy lands fillings were done for the owner's private benefits. However, 2 percent of instances reported are for social benefit such as to construct roads, playgrounds, Children's parks etc.



Source: Primary Survey Data, 2014

Figure 3.1: Purpose of Paddy Lands Filling in Western Province

The majority of land owners of filled paddy lands mentioned that they did it because of increasing demand for highlands. This demand refers to the monetary value of a land due to its location and the demand arises due to lack of highlands. This situation was mentioned by 70 percent of respondents in Gampaha (Nittabuwa near Kandy road) district and for Kalutara and Colombo (Kaduwela and Homagama) districts, it is 64 percent and 77 percent respectively. Thus, heavy involvement of the private sector in land sales and property development and its high pressure marketing strategies have created a spiralling increase in the prices of land and property in the city of Colombo as well as in the suburban areas of Ratmalana, Dehiwala, Maharagama, Kotte, Battaramulla, Homagama, Wattala, and Kiribathgoda. One of the reasons for this was the rapid increase in the number of property developers, especially in Colombo, Gampaha and its suburban areas (Migamuwa, Ja-Ela, Minuwangoda , Veyangoda and in Kalutara district Nagoda, Katukurunda). They were either public or private companies, limited partnerships or individuals. The other characteristics were the increase of land sub-division schemes and sales of building and residential blocks in Colombo and its suburbs. Some of the companies, involved in the earlier largely land subdivision schemes, turned to real estate sector during this period. The second major reason for paddy land filling in the Western province is abandoning of paddy lands in long-run. A mix of macroeconomic and demographic trends, such as de-industrialization, population shifts from urban and rural to suburban areas and the shrinking urban middle class, have precipitated the decline in real estate demand leading to property abandonment in certain neighbouring paddy land. In Gampaha district, 28 percent of respondents have filled their paddy lands for this reason and for Kalutara and Colombo districts, it is 37 percent and 33 percent respectively.

The following figure is a satellite image of Horagolla area of Gampaha district during 2003. The next figure shows the satellite image of the same location during 2013. In 2003, it was a paddy land and after a decade, it is converted to a land full of buildings.

*A GPS Point 7° 8'4.15"N, 80°5'6.11" E
*B GPS Point 7°8'2.56"N, 80°5'8.55" E

Source: USGS landsat satellite image

Figure 3.2: Satellite Image of Horagolla, Gampaha District in 2003

**A GPS Point 7° 8'4.15"N, 80°5'6.11" E*
**B GPS Point 7°8'2.56"N, 80°5'8.55" E*

Source: USGS landsat satellite image

Figure 3.3: Satellite Image of Horagolla, Gampaha in 2013

The above two images clearly show how fast paddy lands are allocated for alterative uses. A bare paddy land converted to a land with full of buildings within a short period of time. This is evidence for severity of paddy land filling in the Western province.

Land fragmentation also led to paddy land filling in the area. Fragmented land includes less land area and it returns a very less yield. Finally land fragmentation ends up with less profit from paddy farming. This situation is considerably high in the Western province with rapid increase of population.

A proportion of abandoned paddy lands in Gampaha district was owned by the government (Urban councils, Pradeshiya Sabha) to allocate them in development projects. Majority of filled paddy lands in the western province are abandoned for more than 10-30 years due to labour shortage. Fewer respondents mentioned that they cannot cultivate paddy lands due to labour shortage.

Proximity to Ekala and Biyagama, Katunayaka Industrial Estate is a major reason for the abandonment of paddy lands as water pollution is high. Hazardous effluent in irrigation canals and solid waste originating from nearby factories dumped on paddy fields has caused disturbance to irrigation system on the one hand and health problems in the other. This deterioration in the quality of water has no direct impact on the crop but has indirectly affected farming. Farmers have noticed a rapid increase in skin-related diseases and become more reluctant to cultivate their polluted fields. A farmer mentioned that the quality of water used to be appropriate for cultivating vegetables, also in the home gardens situated close to the industrial estate. Water used by people in the 1970s for drinking and bathing would be impossible to use today. Polluted water is certainly harming the small-scale farming, but initially other reasons seem to be been of greater importance.

Table 3.12: Extent of Filled Paddy Lands

Extent of Filled Paddy Land	Frequency	Percentage
Not mentioned	03	02
less than 10 perches	72	41
11-20 perches	38	22
21-30 perches	06	03
31-40 perches	05	03
41-50 perches	04	02
51-100 perches	21	12
Greater than 100 perches	26	15
Total	175	100

Source: Primary Survey Data 2014

According to Table 3.12 about 98 percent of respondents in the sample owned filled paddy lands and among them, the majority (41%) owned filled paddy lands with less than 10 perches. The second major proportion of respondents who owned filled paddy lands have filled 11-20 perches. Respondents who owned greater than 100 perches filled paddy land accounts for 15 percent of the sample. Accordingly small scale paddy holdings are filled at a higher rate than large holdings.

Table 3.13: Trends in Paddy Land Filling; Period during Filling Occurred

Period when Paddy Land Filled	Frequency	Percentage
Before 1960s	02	01
1961-1970	03	02
1971-1980	03	02
1981-1990	05	03
1991-2000	21	12
2001-2010	51	30
After 2011	44	26
Filled naturally	43	25
Total	172	100

Source: Primary Survey Data, 2014

The majority of respondents have filled lands very recently (After 2011). About 30 percent paddy land fillings were reported from the 2001 to 2010 period while 26 percent of cases recorded were from 2011 to 2014. About 25% of cases mentioned that those lands were filled naturally.

3.9 Status of Ownership of Highland Properties of Individuals Who Filled Lowlands

Though people mentioned that they filled their paddy lands due to unavailability of other highlands for their needs, the analysis shows that on average each individual utilized adequate extent of highlands for their needs. According to the primary survey statistics, about 36 percent of paddy land owners do not have highland properties while 64 percent of the majority owned highlands. Thus people filled lowlands not to meet their requirements but to earn profit.

Table 3.14: Ownership of Highlands with Buildings

Land Extent	Frequency	Percentage
None	64	37
less than 10 perches	15	09
11-20 perches	22	13
21-30 perches	11	06
31-40 perches	22	13
41-50 perches	02	01
51-100 perches	19	10
Greater than 100 perches	20	11
Total	175	100

Source: Primary Survey Data, 2014

About 37 percent of individuals, who are owners of filled paddy lands, do not have any highlands with building/ house. The rest 63 percent owned highlands which were used to construct buildings or houses. Among them, about 22 percent of the sample owned more than 40 perches (0.25 acre) of highland with a building/house. The proportion of respondents who do not own highlands to construct buildings/houses or own less than 10 perches accounts for 46 percent of the sample.

Table 3.15: Ownership of Cultivated Highlands

Owned Cultivated Highland Extent	Frequency	Percentage
None	145	83
Less than 10 perches	03	02
11-20 perches	02	01
31-40 perches	04	02
41-50 perches	02	01
51-100 perches	06	03
Greater than 100 perches	13	08
Total	175	100

Source: Primary Survey Data, 2014

About 83 percent of individuals, who filled paddy lands, do not have any cultivated highlands. The case study 1 shows how the person who has no highland to construct a house opt for filling of paddy land for construction of their house.

Table 3.16: Status of Highland Property among the Respondents

Uses of Highland	Average Extent (Perches)	Maximum Extent (Perches)	Std Err (Perches)
Construction of buildings/ houses	44	1120	100.9
Highland cultivation	45	1440	182.7
Other	07	320	39.5

Source: Primary Survey Data, 2014

The average extent of highland with buildings/houses in the sample is 44 perches and it ranges up to 1120 perches. The average land extent for highland cultivation for the sample is 45 perches while the maximum land extent recorded as 1440 perches. Among the sample respondents who owned highland properties, average number owned adequate extent of highland properties.

Case Study 01

(Mr. Hewage is 56 years old father of five. He was born in Hambanthota district, 180 km away from Homagama. He came to Panadura in the 1960s looking for a job at the age of 18 years. He was a carpenter by profession and worked for a private contractor for 29 years. In the beginning accommadation was difficult due to high cost. Then he lived with his uncle close to the Battaramulla Junction in Colombo. He met his wife who was living at Gotami road slums area close to his uncle's house. He settled down with his wife's parents after marriage. In 1995 his left leg was badly injured. He could not continue as a carpenter due to medical reason. This situation created a lot of financial problems. They did not have any savings. Their relatives provided some assistance. Then he started a business at his house. He started selling commodities needed for daily life. He earns around Rs. 15,000 per month. The income from his business is sufficient for his family expenses. Four of his children are married and living separately in the same land where their mother's house is located. This land is still not legalized. Part of their settlement is located in the abandoned paddy land. The Pradeshiya Sabha member has informed them that no family will be allowed to stay on the same location as they are currently living on the paddy land. Hence, they organised into a Community Development Organization to negotiate with the Agrarian Serves Centre for a better relocation project. Now, he is playing the lead role in negotiating with the relevant agencies to get an alternative land for their houses.)

GPS point 7.142023^{0}N, 79.930295^{0}E

Source: USGS landsat satellite image

Figure 3.4: Satellite Image of Temple Road, Kotadeniya, Ekala in 2003

**A GPS point 7.142023°N, 79.930295°E*

Source: USGS landsat satellite image

Figure 3.5: Satellite Image of Temple Road, Kotadeniya, Ekala in 2013

Accordingly the warehouse located at a corner of large paddy field and the surrounding paddy lands are at risk of abandoning because of waste disposed from the warehouse. The following is a close view of that warehouse. Further, the image shows that it obstructs an irrigational canal.

Source: An image taken during the primary survey 2014

Figure 3.6: Warehouse Located in Temple Road, Kotadeniya, Ekala in 2013

From early 1980s to early 1990s, housing, and urban development has been one of the key target areas of the government's development agenda. Implementation of national level programmes and strategies to improve the country's housing and human settlement sector was thus undertaken during the above period. The one Hundred Thousand Houses Programme (1978 - 1983), one Million Houses Programme (1984 - 1988) and 1.5 Million Houses Programme (1989 - 1994) were the national programmes (Colombo Municipal Council, 2001). Strong political commitment and support right from the Cabinet level to the local authority and village levels were available for implementation of these programmes. It is interesting to note that the partnership approach adopted in the pilot project provided a platform for all the stakeholders to agree on their responsibilities and to perform accordingly. Such a partnership approach seems to be more appropriate than a provider-based approach generally preferred by the government. As a result, the community itself has taken over the operation and maintenance activities for their infrastructure on self-help and self-finance basis.

The community illustrated in this example is Katana Settlement, in Ambalamulla paddy land (wet land) in Gampaha. It is a resettlement site, for families removed from a roadside squatter settlement in a nearby town centre, with about 22 families. But this resettlement programme is not well organized as explained about settlement establishment during 1978–1994 periods. Under conserved resettlement programme, each family was given a 100 m^2 sized plot of land with Rs. 16,000.00 as cash compensation for their houses. The community was removed to the new site in 2005. When the relocation took place there were no facilities. The people had to walk about ½ km to fetch water. No toilet facilities were available and no guidance was given on how to build the houses. Subsequently, the community made an appeal to the Minister of Transport and Highways requesting to provide basic services. Eventually, four stand posts and two common toilet blocks were installed. However, there was no organised effort to develop the community. The community organised into a Community Development Movement and started making requests for support to develop their community.

A number of abandoned paddy lands in the Western province should be converted to profitable ventures, but most farmers say these lands need a large amount of money to invest for cultivations. According to the Department of Agrarian Services, a number of urbanized paddy lands were diverted into commercial ventures legally or illegally (Asiantribune.com).

The figure shows a satellite image of GSP location ***7.13804° N, 79.925437° E***. The first image was taken in 2003 and the next image was taken in 2013. It is notable that during 2003 it was a bare paddy land and by the time of 2013 the land is converted to a factory area. This is located in Ekala, Kotadeniya area of Gampaha district. The last image shows a close view of the front side of the factory. In this case, a greater extent of paddy land is filled.

A GPS Point 7.13804° N, 79.925437° E
Source: USGS landsat satellite image

Figure 3.7: Satellite Image of Kotadeniya, Ekala in 2003

**A GPS Point 7.13804^{0} N, 79.925437^{0} E*

Source: USGS lands at satellite image

Figure 3.8: Satellite Image of Kotadeniya, Ekala in 2013

Source: An image taken during the primary survey 2014

Figure 3.9: Factory Located in Kotadeniya, Ekala Area 2013

A number of incidents on paddy lands filling were tabulated with distance to those lands from the residence of land owners. Table 3.17 shows the results of the analysis.

Table 3.17: Distance to Filled Paddy Land from the Residence of Land Owners

Range	Frequency	Percentage
0.25 – 2.0 Km	64	36
02.1-05.0 Km	108	63
05.1 – 10.0 Km	01	0.5
10.1 – 20.0 Km	01	0.5
Total	175	100

Source: Primary Survey Data, 2014

It is notable that majority of filled paddy lands (nearly 64%) are located 2 to 20 km away from land owner's residence. This long distance can be one reason for not cultivate paddy lands for a long period of time in the Western province. The distance between filled lands to the residence ranges from 0.25 km to 20 km in the study area. About 36 percent of farms were located within two km, 63 percent between 2 and 5 km. Average distance from filled land to the residence is 0.67 km. It can not assume that people filled those paddy lands due to being located far away from their residence as nearly 99 percent of filled paddy lands are located close to the residence.

3.10 Time Spent on Filling

The majority of the respondents spent less than a week for filling and that accounts for 39 percent of the sample. These people use to fill lowlands within 2-3 days. Especially they do this on weekends or public holidays to evade the authorities' attention. People fill paddy land using machinery (truck, backhoe) spending a huge amount of money. Officers at ASCs have to make great efforts to stop those fillings and it should be immediate. Nearly 17 percent of the sample indicate that those lands were filled slowly by accumulating crop residues and domestic garbage as those lands were abandoned for more than 10 years.

Table 3.18: Time Spent on Filling

Time Spent on Filling	Frequency	Percentage
less than one week	51	39
1-2 weeks	11	08
2-3 weeks	03	02
1 month	14	11
2-3 months	11	08
3-6 months	02	01
1 year	04	03
1 year to 10 year	15	11
More than 10 years	21	17
Total	132	100

Source: Primary Survey Data, 2014

In certain cases, land filling has followed abandonment. In the Western province illegal or unauthorised filling is common. There are several reports of how land-owners, despite being aware of the legal status, fill their lands with garbage and hazardous materials. Illegal fillings are performed during the night especially on Fridays or Saturdays to avoid detection. When police and government workers arrive on weekdays, the filling has already been completed. Due to potentially high land value, filling is a politically sensitive topic. Land owners or potential buyers ("affluent people") work closely with the local politicians to exploit loopholes in the existing laws and regulations. Thus, the police is not able to take action.

3.11 Uses after Filling of Paddy Land

Table 3.19 shows different uses of filled paddy lands in the Western province. About 62% of filled paddy lands are used for constructions. Low-lying lands are not suitable for construction due to the prevailing soil conditions and high content of water. To enhance the economic value of abandoned paddy lands, and wetlands overall, land filling is a well-known procedure. Properly planned and performed fillings are no obstacle to either paddy cultivation or the general water flow. Unfortunately unauthorised and inadequately planned land fillings are occurring at large scale, disturbing natural drainage patterns.

Table 3.19: Uses of Filled Land

Uses of Filled Lands	Frequency	Percentage
Constructions	108	62
Cultivate highland farming	30	17
No use	17	09
Sell	8	05
Road	7	04
Development project	1	0.57
Fish farm	1	0.57
To gift to children	1	0.57
Cemetery	1	0.57
Religious purpose	1	0.57
Total	175	100

Source: Primary Survey Data, 2014

This is a major concern particularly among urban planners where improper drainage will eventually increase the damage due to floods. About 17 percent of filled lowlands were used for highland cultivations like coconut, vegetables, tea, ginger etc. Farmers seem to be interested in cultivating other crops and they are already practising that cultivation. Banana, coconut, and leafy vegetable are the alternative options among them. Nearly 9 percent are currently not used due to legal action against fillings. Paddy land filling in the Western province affect the environment as it blocks the natural drainage system. Flood is a major consequence of paddy land filling in the Western province.

The following figures show an incidence of paddy land filling in Nittambuwa area of Gampaha district. A supermarket is built in a paddy land beside the Colombo-Kandy main road. The following figures show that the building is constructed by obstructing an irrigation canal.

A GPS Point 7° 8'4.15"N, 80°5'6.11" E
B GPS Point 7°8'2.56"N, 80°5'8" E.55

Source: An image taken during the primary survey 2014

Figure 3.10: Supermarket Located in Nittambuwa Area

Water supply to the rest of the cultivating paddy lands is disturbed by this obstruction and the surrounding paddy lands to the supermarket is at risk of being filled due to waste disposal. The canal obstruction also caused floods in the rainy season.

B GPS Point 7°8'2.56"N, 80°5'8" E.55

Source: An image taken during the primary survey 2014

Figure 3.11: Obstruction of Irrigation Canal due to Construction of the Supermarket

The following figure shows a paddy land which is to be sold after filling. It is located on the other side of the same land (Near supermarket).

Source: An image taken during the primary survey 2014

Figure 3.12: A Location of a Filled Paddy Land to be Sold

Accordingly in 2003 it was a paddy land and by 2013 it is filled. One part of that land is used for constructing a supermarket and the other part is to be sold.

Case study example

Paddy Land sale through e-bay website

Property details: 376.5P Cultivated (Paddy) Land for Sale in Kalutara. In Kalutara district, 376.5P paddy land, located close to Kalutara – Nebada (Horana) main road, walking distance to main road (20m) and the Southern Lanka Express way inter-change, Dodangoda, Kalutara (3Km), close to school, calm, quiet environment, with all facilities, fast access to banks, commercial outlets, market and the fair for a comfortable area, is available for sale at Bombuwala, Kalutara. Close to Nagoda Government Hospital(4Km), Police Training College (4Km), S.T.F.Camp (4Km), Academy of National Health, Kalutara, (4Km) and Paddy Research Institute, Bombuwala. Electricity, natural water, telephone and well transport facilities are available. 8.5km to Kalutara city (10 minutes drive). Well, maintained and attractive nice place. 20ft access road. Clear deeds. Highest offer.

http://www.lankapropertyweb.com / agriculture/Paddy%land

Paddy Land with Coconut Cultivation, Real Estate, Land for Sale Colombo Classifieds

For Sale: Rs 500,000.00

Item #	63281
Location:	Colombo
Category:	Land for Sale
Contact Details:	071xxxxxxx 071xxxxxxx
Posted by:	071xxxxxx
Date Entered:	Wednesday, March 21, 2012
Expiration:	Sunday, May 6, 2012
Currently:	For Sale
Description:	Malambe Close to SLIIT campus 50 yards from main road 80 perch paddy land With land area Banana cultivation and 25 coconut plats Only for Rs. 500,000 (five hundred thousand) urgent money need 071xxxxxxx

http://www.lankapropertyweb.com / agriculture/Paddy%land

Table 3.20: Obstruction to Irrigation Canal

Disturbance to Irrigation Canal	Frequency	Percentage
No	120	69
Yes	55	31
Total	175	100

Source: Primary Survey Data, 2014

Obstruction of irrigation canals due to paddy land filling had bad implications on both paddy cultivation in other nearby paddy lands and creating floods. It drastically changed water conditions in the paddy fields. About 69 percent of filled lands did not cause an obstruction to the irrigation canal. Among the people who sold their filled paddy land (about 8 percent of the sample), majority mentioned that they did so because it generates higher profit. In Panadura, Homagama, Nagoda areas, effects

of land filling already show the impact of increased flood damage. Floods in the area that used to last for 2-3 days now remain for 2-3 weeks. Although there has been little damage of economic importance, paddy cultivation has already ceased to exist partly due to the side effects of filling.

For example, environmental condition in the areas of Bellanwila, Aththidiya and Boralesgamuwa has been polluted due to urbanization. Lowlands close to Bellanwila are threatened by floods because of urbanization and its consequences of industrialization. Water holding lowlands in the area such as paddy lands, *Deniya, Owita* are filled ill-legally very frequently and irrigation canals have been polluted due to garbage accumulation. It leads to reduction and destruction of natural water holding areas/ rain fed areas.

Nugegoda, Kattiya Junction, Walaw Waththa, Delkanda, Katu Ela, Ratnapitiya, Diwulapitiya, Boralesgamuwa, Bokundara, Piliyandala, Karadiyana and Bellanwila areas have been threatened by this situation. Hence, a proper drainage system to drain rainwater and a program to develop its environment is needed.

3.12 Legal Aspects of Paddy Land Filling in Western Province

About 85 percent of the filled paddy lands were filled illegally (Table 3.21). The majority of the respondents do not request permission from the relevant authority. Local politicians lack vision and are keen on retaining their political image. Indirectly, policy in these areas tends to be the promotion of industrial activities and encourage people to engage in other employment other than farming. Usually, farmer or landowner is filling the land for individual purpose, such as for the construction of a house.

Table 3.21: Paddy Land Filling with Legal Permission

	Frequency	Percent
No	148	85
Yes	27	15
Total	175	100

Source: Primary Survey Data, 2014

Despite this, there are also clear economic interests in filling land for selling. This may be done legally or illegally. Problematic situations occur when filling of land is carried out inadequately and not according to the zoning plan but on ad hoc basis. Here a proper approval system of land filling also plays a major part in creating a fair land use system for the benefit of all. Land filling applications have to pass through all relevant authorities, i.e. ADD, CEA, SLLRDC, UDA and the local authorities before, if the given conditions are fulfilled, approval is granted. Due to poor institutional infrastructure and lack of guidelines, land fillings are presently approved without proper information or investigation.

3.13 Action Against Illegal Filling

A possible consequence of this is the unauthorised land filling occurring in all parts of the country. Other main reasons of illegal filling are the lack of knowledge about proper procedures among "fillers", tedious administration or political interference. The authority to prevent illegal filling and initiate legal action against the violaters lies with the local authorities; SLLRDC, Urban Development Authority and Irrigation Department, have no power to engage in this. Most people apply for filling a small extent of land (10-12 perches) for constructing a house. Table 3.22 shows different action taken against illegal paddy land filling.

Table 3.22: Action Against Paddy Land Filling

Action	Frequency	Percent
Warned	89	52
File a case in court	41	23
Order by police	10	06
None	35	19
Total	175	100

Source: Primary Survey Data 2014

Accordingly 52 percent cases were stopped in that manner and 23 percent of the cases are filed in court. Approximately 6 percent of cases were stopped following police order. However, there are 19 incidents of filled paddy lands for which, no any action was taken.

Table 3.23: Court Cases

Whether pending legal action or not	Frequency	Percentage
No	134	77
Yes	41	23
Total	175	100

Source: Primary Survey Data 2014

Among the sample about 23 percent of paddy land filling (approximately 1/4) has been reported in court as illegal paddy land filling. Out of that, 57 percent received the court verdict.

On average, a case on illegal paddy land filling takes about four years to get court decision and a person has to spend about Rs 150,000 including lawyer fee and other expenses for that. Sometimes a person may face more than one court case related to paddy land filling. About 86 percent of people face legal action due to one case of illegal paddy land filling. Nearly four percent face two cases.

CHAPTER FOUR

Legal Lapses and Problems Faced by Relevant Officers

4.1 Introduction

The chapter describes information gathered from officers at Agrarian Service Centers. The first section describes the official background of Agriculture Research and Production Assistants (ARPAs) in the Western Province and the infrastructure status where they employ. Then the chapter briefly describes paddy cultivation status in the area accordingly the official secondary information. Next section highlights the proportion of incidence on paddy land filling with permission, reasons for granting permission for those lands, the proportion of illegal paddy land filling cases and the reasons for those illegal fillings according to officer's point of view. Then the chapter describes the consequences following filling low lands. It explains the action taken by officers against paddy land filling, institutional support for their duty and personal issues they have to face in such situations. The chapter includes a brief section on paddy land filling for common purposes. Finally, the chapter describes the act and regulations on paddy land filling and their weaknesses at present.

Table 4.1: General Information about the Officials and the Institutional Set-up

Description	Gampaha	Kalutara	Colombo
Average extent of area per officer (Acre)	159	1048	-
Average number of GN divisions/officer	2	1	1
Duty days/week/officer	4	3	7
Distance from resident to relevant ASC (Km)	6.3	8.8	-
Total no of families in the area	1110	687	350
Number of farmer families in the area	63	117	70

Source: Primary Survey Data, 2014

As shown in Table 4.1, the average of officially responsible area per officers at ground level varies in three districts. Officers in Kalutara district need to cover a larger area than the officers in Gampaha district. The larger expanse makes supervision difficult as the officers have to travel far. According to the study, Agricultural Research and Production Assistants (ARPS) in the three districts have to cover one or two villages. Thus, the number of duty days in the field also varies in three districts. The officers work in a village for one to two days and at another in the rest of the week. This situation creates a dearth of officers in the village.

The main responsible state level department regarding land filling issues is the Agrarian Development Department. The distance from the work area to the relevant office is also taken into consideration in this study. Accordingly, the average distance

from the work area to the responsible ASC is higher in Kalutara district (8.8 km) than in the Gampaha district (6.3 km). But in the Colombo district, most of the officers were not aware of the distance to the relevant office. The total number of families in the officially responsible area is considered in visualizing the level of population. The average of the population in ARPA's duty area is the highest in Gampaha district but the number of farm families per ASC division is the highest in the Kalutara district.

4.2 Status of Paddy Land in the Area

Table 4.2: Details of Paddy Lands in the Study Area (Percentages)

Description	Gampaha (%)	Kalutara (%)	Colombo (%)
Cultivating paddy land	62	60	86
Currently not cultivating paddy land	5	4	Insignificant
Abandoned paddy land	21	32	7
Filled paddy land	13	5	7

Source: Primary Survey Data, 2014

According to the Table 4.2, availability of cultivating paddy lands in three districts was different. Within the population, Colombo district shows the highest percentage of lowland cultivation which accounts for 86 percent of total lowland in the district whereas Gampaha and Kalutara showed lower levels compared to the Colombo district and those were 62 percent and 60 percent respectively. The table also illustrated that currently a non-cultivated paddy land (not abandoned) area in Gampaha and Kalutara districts is five and four percent respectively. Furthermore, the percentage of abandoned paddy land extent in Kalutara district is the highest and it was 32 percent. However, in Colombo district, the abandoned land area is low compared to other two districts in the Western Province. The highest paddy land filling percentage was observed in the Gampaha district and it was 13 percent of the total paddy land area in the district because of the increasing demand for land especially for residential purposes. The lowland filling percentage was the lowest in Kalutara and Colombo districts which show five percent and seven percent of total paddy land in each district respectively.

Table 4.3: Legal Status of Filled Paddy Lands in Western Province

Description	Frequency	Percentage
Filled with permission	43	68
Filled without permission	19	30
No response	1	2
Total	63	100

Source: Primary Survey Data, 2014

Table 4.3 describes the situation, whether landowners have filled their paddy lands legally or ill-legally according to the official records at Agrarian Service Centers. Accordingly as a percentage, the permitted land fillings were observed as 68 percent of the total filling incidences. From the total permitted filling incidences, about 40 percent of paddy land fillings were reported due to unavailability of other lands to construct houses. Moreover, the total paddy landfilling without permission accounts for 30 percent of the sample. Further, two percent of the sample did not show any response to the survey. They refused to respond.

4.3 Filling with Permission

Table 4.4: Reasons for Granting Permission to Paddy Land Filling in the Western Province

Reasons for Granting Permission	Land Extent (Perch)	Percentage of Total Permitted Filled Paddy Land Extent (%)	No of Reported Cases	Percentage of Total Number of Reported Cases (%)
No, other land owned	36	06	8	40
Geographically being a highland	310	50	4	20
Paddy not grown	252	40	5	25
For common cause	07	01	2	10
For perennial crops	20	03	1	05
Total	625	100	20	100

Source: Primary Survey Data, 2014

Table 4.4 demonstrates the reasons for giving permission to fill paddy lands in the Western province by the Agrarian Service Department. Accordingly, 40 percent of the permitted cases employed the reason of not owning lands other than the concerned land for farmers to live. Therefore, in the Western Province, six percent of legally filled paddy land received government permission on the ground of owning any other land. Twenty percent of cases were granted permission because of the geographical location; hence water supply to a highland being difficult when cultivated. Moreover 25 percent of the cases were approved as it was difficult to grow paddy due to different reasons such as lack of water, no irrigation canals and being an infertile area. According to the investigations, it is easy to obtain permission to fill paddy land if it is for common purposes such as roads, temples, churches etc. Therefore, the individuals eager to fill their lands were happy to provide a small area of land for a common purpose. And also, it is important to make the lands productive than abandoning the cultivating of the land. Therefore, five percent of the permitted land fillers received permission to grow perennial crops. This strategy was implemented by the most land fillers seeking permission to fill their lands. Therefore, at the initial stage, they started to grow coconut in the edges of the

paddy fields. Then gradually the land is filled without permission and this strategy was used if some perennial crop has been grown for several years.

4.4 Illegal Paddy Land Filling

Table 4.5 shows different reasons for illegal paddy land filling in the Western Province. People tend to engage in illegal filling mainly to build houses or business places. However, majority of illegally filled paddy lands were not used for any purpose due to the legal status of those lands.

Table 4.5: Reasons for Illegal Land Filling

Reason	Percentage of Total Extent of Ilegal Paddy Land Filling (%)	Percentage of Total incidences (%)
Build a house	38	23
For a business place	27	18
Road	01	02
To grow annual crops	21	18
For a sports ground	01	02
to build a public hall	Negligible	02
Not being used	04	21
To grow perennial crops	08	14
Total	100	100

Source: Primary Survey Data, 2014

As shown in table 4.5, nearly 23 percent of the land of the cases reported by the officers was filled illegally to build houses and 18 percent for business places. Other than that 18 percent and 14 percent were for growing annual and perennial crops respectively. This reason has been exploited by illegal land fillers as on certain occasions government approval is granted to grow perennial crops in unutilized land and in that guise the most of the paddy lands in the Western Province of Sri Lanka are filled. Moreover few cases reported cited construction of a public road, sports ground, religious place or a social activity as reason for filling.

Table 4.6: Problems due to Illegal Land Filling

Consequences	Frequency	Percentage
Blocking of irrigation canal	40	64
Floods	39	62
Blocking the access roads of other cultivated lands	15	24
Accumulation of topsoil in cultivating lands	12	19
Continuation of the trend to fill low lands	06	10

Note: Summations of percentages in each district do not equal to 100% due to multiple responses
Source: Primary Survey Data, 2014

As shown in Table 4.6 due to filled paddy lands irrespective of its legal status, authorities and other farmers face several problems. The main problem is blocking of irrigation canals (64%). Blocked irrigation canals pose other challenges such as the difficulties in irrigating of the adjoining paddy fields and the increased threat of flooding which has a greater possibility (62%) in the wet zone. Illegal filling created problems in accessing to other fields. Moreover accumulation of topsoil in cultivating lands has also become (19%) a constraint. It is also common that other farmers also try to fill their lands illegally as the demand for highland in the Western province is very high.

Table 4.7: Neighboring Locations of Filled Paddy Lands

Marginal Locations (At least one border of the land)	Frequency	Percentage
Cultivating land	24	38
Highland	24	38
Another filled land	12	19
Abandoned land	25	40
Main road	28	44
Sub-road	14	22
Irrigation canal	11	18

Note: Summations of percentages in each district do not equal to 100% due to multiple responses

Source: Primary Survey Data, 2014

Table 4.7 shows the neighboring location of the filled lands as a percentage of the total number of cases. The majority of filled paddy lands are located close to the main road or another abandoned paddy land or highland.

4.5 Reasons Behind Illegal Paddy Land Filling

Table 4.8 illustrated the reasons for illegal land filling from the officers' point of view. They described that more than 79 percent of the farmers filled their lands illegally since they had no justifiable reason to apply for permission. Other than that 51 percent of the officers stated that permission obtaining is a very difficult and time-consuming activity. Therefore even though farmers are aware about obtaining permission as a requirement they are not willing to apply for permission. Obtaining permission even for a valid reason takes more than five years. Therefore, farmers carry a negative impression about obtaining permission.

Table 4.8: Officers' Views about the Reasons of Illegally Paddy Land Filling

Reason	Frequency	Percentage
Having no justifiable reason to request permission	48	79
Permission obtaining being a tedious process	31	51
Unawareness among farmers	9	15
Neglected due to less extent	3	05
Permission not requested as the project being a government one	2	03
Permission not requested due to being abandoned land	1	02

Note: Summations of percentages in each district do not equal to 100% due to multiple responses
Source: Primary Survey Data, 2014

4.6 Action Against Illegal Filling

Table 4.9 shows different action taken against paddy land filling by the officers. Percentages are of the total number of cases reported. The majority of fillings have been stopped (52%) by officers by warning the land fillers. About 38% of the illegal land fillers were taken to court to resolve the matter. Other than that officers have obtained police orders to stop the illegal land filling and approximately it is about five percent from the total number of cases reported.

Table 4.9: Action Taken by the Officers Against Illegal Land Filling

Action	Percentage of Total Extent of Illegal Fillings (%)	Percentage of Total Incidents of Illegal Fillings (%)
Warned and stop the filling	63	52
File a case in court	29	38
Police order to stop the filling	02	05
No action	06	05
Total	100	100

Source: Primary Survey Data, 2014

Officers also stated that they have already taken action against 78 percent of reported cases but they were unable to take any action against 21 percent of the cases due to political interference.

4.7 Institutional Support for Court Cases Regarding Paddy Land Filling

The Table 4.10 shows the supportive institutes helped ARPAs in taking action against paddy land filling. According to the officials interviewed, the following institutions are engaged in at different stages. Accordingly police intervention was identified as 13 percent whereas Agrarian Service Centers were involved in around seven percent of the cases. Other than that the Department of Irrigation, Department of Legal Affairs and Community Based Organizations (CBO) were also involved in this regard.

Table 4.10: Institutes and Activities Related to Land Filling Issues

Institute	Frequency	Percentage
Police	8	13
Agrarian Service Centre	4	07
Irrigation Department	1	01
CBO	2	03
Department of Legal Affairs	1	01
None	47	75
Total	63	100

Source: Primary Survey Data, 2014

The results suggest that though it is the duty of ARPAs to take action against paddy land filling, they get little support from other institutions which are also responsible for stopping unnecessary paddy land fillings. Only seven percent of ARPAs mentioned that they are supported by Agrarian Service Centers. That is because of either political influence or taking action against illegal paddy land fillings also bring personal security issues to Development Officers of those centers.

With regard to pending court cases officers are responsible for court appearance and they should bear the traveling and stationary expenses regarding the case. However, the ASC centers bear the lawyer fees.

4.8 Personal Issues in taking Action Against Paddy Land Filling

Table 4.11 shows different personal issues faced by officers in taking action against illegal paddy land filling. Percentages are based on the total number of respondents. Accordingly 56 percent of officers stated that they were forced to let go the cases with political patronage. About 30 percent of interviewed officers mentioned that they lose the goodwill with villagers due to taking action against paddy land filling. Another 19 percent of them said they have to face public criticisms because of this matter. Two percent of officers have been assaulted and sustained injuries when they took action against illegal paddy land filling.

Table 4.11: Officers' Personal Issues which Impact Land Filling Issues

Personal Issue	Frequency	Percentage
Coercion/ Forced to abandon the case	35	56
loss of goodwill with villagers	19	30
Deplore of official duties	17	27
Criticisms in public	12	19
Assault	01	02

Note: Summations of percentages in each district do not equal to 100% due to multiple responses

Source: Primary Survey Data, 2014

4.9 Paddy Land Filling for Common Purpose

The Table 4.12 elaborated the practice of land filling for common purposes. According to officers, among total incidents of paddy land fillings for a common purpose, about 37 percent of the land filling was done for the construction of roads. Other than that building of religious places (both temple and mosque) also accounted for 26 percent of the incidents. Moreover, land filling was done for the reasons such as the construction of play grounds, public halls and the creation of places for garbage disposal in following percentages.

Table 4.12: Land Filling for Common Purposes

Uses of Filled Paddy Land	Percentages of Incidence of Filled Paddy Land for Common Purposes (%)
Road	37
Temple	13
Mosque	13
Play ground	18
Public hall	13
Place for garbage disposal	06
Total incidences	100

Source: Primary Survey Data 2014

4.10 Irrigation Methods Used in Filled Land

As described by the Table 4.13 paddy lands filled for common purposes, used several irrigation methods for cultivation. Accordingly, 71% of the filled land for road construction was cultivated using the rain-fed method whereas 29% of that land was cultivated using water from the irrigation canal. Hundred percent of filled paddy lands for religious places have been previously grown by the rain water. Other than that land filled for play grounds and public places were previously grown using the irrigation water.

Table 4.13: Irrigation Methods Used for the Land Prior to being Filled for Common Purposes

Uses of Filled Paddy Land	Irrigation Method (Percentage of incidence of Filled Paddy Lands for Common Purposes)		
	Using Irrigation Canal (%)	Rain-fed (%)	Total (%)
Road	29	71	100
Temple	00	100	100
Mosque	00	100	100
Play ground	100	00	100
Public hall	100	00	100
Garbage site	00	100	100
Total incidences	41	59	100

Source: Primary Survey Data, 2014

4.11 Cultivation Status of the Filled Land for Common Purposes

Table 4.14 describes the cultivation status of paddy lands filled for common purposes in the Western Province of Sri Lanka. Among the incidences of paddy land fillings for common purposes, 60 percent of the land was abandoned. Nearly 13 percent of the filled lands were not cultivated very recently. The survey disclosed that 37 percent of the filled lands for common purpose were being cultivated and productive lands.

Table 4.14: Cultivation Status of the Filled Paddy Lands for Common Purposes

Uses of Filled Paddy Land	Type of Filled Paddy Land (Percentage of incidence of filled paddy lands for common purposes)			
	Cultivating Land (%)	Currently not Cultivating (%)	Abandoned Land (%)	Total (%)
Road	72	14	14	100
Temple	00	00	100	100
Mosque	00	00	100	100
Play ground	33	00	67	100
Public hall	00	50	50	100
Place for garbage disposal	00	00	100	100
Total incidences	37	13	60	100

Source: Primary Survey Data, 2014

Table 4.15: Permission Procedures Followed in Land Filling for Common Purposes

Procedure of Getting Permission for Paddy Land Filling in Case of a Common Purpose	Frequency	Percentage
Follow the normal procedure	9	15
Fill without permission	1	02
Inform the government prior to filling	3	05
Permission under special consideration	3	05
No response	47	73
Total	63	100

Source: Primary Survey Data, 2014

As shown in the Table 4.15, about 15 percent of cases of paddy land filling for common purposes followed the normal procedure in obtaining permission for the land filling. About two percent of the cases were filled without obtaining permission. Five percent of the cases were filled by simply informing the authorities but without following the normal procedure. Moreover, five percent of the cases received permission under special consideration of the officials. About 73 percent of the officers (ARPAs) do not have knowledge about the procedure of obtaining permission to fill the paddy land for a social purpose.

4.12 Issues Faced when Taking Action Against Paddy Land Filling

The Table 4.16 shows the issues related to the procedure of granting permission for paddy land filling. Accordingly 75 percent of the officers mentioned that, permission granting procedure was highly time consuming. It is the major issue in the procedure of obtaining permission to fill paddy land. Other than that factors such as influences from farmer organizations against granting permission to paddy land filling, issues with property rights (not having well-defined ownership) and issues in defining the land (as Deniya/Owita/Amuna) influences the process of permission granting for paddy land filling.

Table 4.16: Issues in the Land Filling Process

Issue in the process of granting permission	Frequency	Percentage
High time consumption	47	75
Objections from farmer organizations	29	46
Interference	28	44
Issues with property right	23	37
Definition of land	20	32

Note: Summations of percentages in each district do not equal to 100% due to multiple responses

Source: Primary Survey Data, 2014

4.13 Issues in Rules and Regulations

The Table 4.17 describes the issues/weaknesses in rules and regulations regarding paddy land fillings identified by the relevant officers. Accordingly 51 percent officers stated that the rules and regulations are not much suitable and 30 percent of the officers believed that the rules and regulations are stringent. About 40 percent of them commented that even police do not have power to act against the problems of paddy land filling due to rules and regulations that restrict them from acting against it.

Table 4.17: Issues in Rules and Regulations of Land Filling

Issue	Frequency	Percentage
Less power vested with police in taking action	25	40
Incompatibilities in rules and regulations	32	51
Stringent rules	19	30
Absence of alternative rules & regulations for paddy lands where farming is difficult	26	41

Note: Summations of percentages in each district do not equal to 100% due to multiple responses
Source: Primary Survey Data, 2014

4.14 Other Problems Faced by Officers

Table 4.18: Other Problems Faced by the Officers Engaging in Land Filling Control Duties

Personal issues	Frequency	Percentage
Lack of physical & financial facilities to work	35	56
Lacking goodwill with villagers	38	60
Life risks and criticism	36	57
Threats to personal security	24	38

Note: Summations of percentages in each district do not equal to 100% due to multiple responses

Source: Primary Survey Data, 2014

The Table 4.18 describes other personal issues faced by officers engaging in land filling related duties. They complained that (56%) they lacked the physical and financial facilities such as office facilities or monetary support to rent an office room, photocopy charges which required working towards the land filling duties. Other than that officials faced problems such as straining of the relationships with villagers (60%) due to misunderstanding. At times duties carried out to stop the land filling become life threatening (57%) to the officers due to illegal elements engage in land filling. Some female officers stated a greater risk (38%) of personal security issues.

CHAPTER FIVE

Conclusion and Recommendations

Conclusions

1. Lowland owners in the Western Province are facing irrigation issues (38%), labour shortage (31%), sand and salinity condition in soil (24%) and the high cost of production (23%) in paddy farming. Due to those reasons, 70% of the majority abandoned their paddy lands.

2. Greater part of cases of paddy land filling (71%) is abandoned lands while 18% accounts for reservations/Owita/Deniya.

3. Approximately 92% of filled paddy lands were not cultivated for 10 or more than 10 years. And also the majority of filled paddy lands were cultivated under the rain-fed irrigation system in which the average yield is low and the profit is low.

4. People fill paddy lands due to the increasing demand for highlands (70%), abandoning of land in the long-run (33%), employment transition from agriculture to another field (58%) etc.

5. People use those filled paddy lands mainly to construct buildings (62%) and cultivate highland crops (17%). Some people could not use those filled lands (09%) due to legal issues.

6. People used to fill paddy lands within 2-3 days. Especially they do this on weekends or public holidays to evade authorities' attention. In many cases, people tend to fill lowlands close to another abandoned paddy land (39.7%), highland (38.1%), irrigation canal (17.5%) and the main road (44.4%).

   About 31.4% of cases related to paddy land filling are obstruction to irrigation canals.

7. The majority of paddy land filling (85%) was done illegally. About 77.7% of them have not sought for permission from Agrarian Service Center (ASC) and the rest 22.3% engaged in illegal filling after rejection of their request by ASC. On average it takes about one year to grant permission as the request goes through 10 responsible government institutions.

8. Greater part of the cases (52%) in paddy land filling was stopped by ARPAs by warning them. About 38% of cases were reported to the court and 4.7% were stopped by an order of Police. In many cases the court decision was to stop

further filling/construction (56%) while 44% were ordered to remove the soil and restore paddy lands.

9. Floods (62%) and obstruction of irrigation canal (64%) are the main issues faced by villagers due to paddy land filling.

10. In general, ARPAs or ASCs are reluctant to grant permission to paddy land filling except an unavoidable reason. Permission was granted on the basis of, (i) No other land owned by the individual- 40%, (ii) Cannot grow paddy in those lands practically- 25% and (iii) that land being a highland (20%).

11. As ARPAs said, people engage in illegal filling as there is no justifiable reason behind it (78%) and they are not willing to bear huge investment of time and effort on it (51%).

12. About 20% of the officers are unable to take action against illegal filling of paddy lands because of political interferences.

13. When ARPAs act against such illegal cases they have to face serious personal issues such as coercion/ forced to forgo the case (56%), assault (2%), criticisms in public (19%), deplore of official duties (27%) and loss of goodwill with villagers (30%).

14. As the majority of officers (50%) mentioned there is no one to protect them in such cases. Even they have to bear the cost associated (travelling, photocopies etc) when the case is pending in court. A lawyer from Agrarian Service District Office will appear for ARPAs.

15. Objection from farmer organizations (46%), interference from a third party (44%), property right issues (36%-37%) and difficulties in defining of land as Owita/Deniya/"Goda-Mada Idama" are the issues faced by officers in acting on paddy land filling.

16. Incompatibilities and contradictions of rules and regulations (50.8%), unavailability of alternative rules and regulations for paddy lands where farming is difficult (41%), insufficient power vested with police (39.7%) and harsh rules (30.2%) are the issues faced by officers as the weakness of the rules and regulations against paddy land filling.

Recommendations

1. The government needs to take immediate and practically viable action to re-cultivate abandon paddy lands to stop the further filling of those lands. Farmers are reluctant to cultivate because of the high cost of production and government should take measures to reduce the cost of production in farming.

2. There should be alternative rules and regulations in Paddy Land Act for paddy lands where farming is not practical. Those lands should be identified and allowed alternative uses conditions.

3. It is needed to create a proper linkage between different institutions related to paddy land filling. Ex: When the Road Development Authority is implementing a project near a paddy field, it should be directed to get the recommendation from ASC of the relevant area. Further, when government issuing a license for sand/clay mining, the responsible institutes should obtain recommendation from ASC to ensure there is no impact on paddy farming in that area.

4. Officers at ASC are facing serious issues when they act against paddy land filling. Thus, it is noteworthy to establish a separate unit to take immediate action on illegal filling under strict supervision of Development Officers and ARPAs (Similar to the Forest Department).

5. Use of social media to investigate filled paddy land locations and its surroundings to estimate/examine possible negative consequences of it.

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ANNEXURE 01

Rules and Regulations on Conservation of Paddy Lands in Sri Lanka

Sri Lanka Conservation of Paddy Land

Agrarian Development Act, No. 46 of 2000, [Certified on 18th August 2001,
AN ACT TO PROVIDE FOR, MATTERS RELATING TO LANDLORDS AND TENANT CULTIVATORS OF PADDY LANDS, FOR THE UTILIZATION OF AGRICULTURAL LANDS IN ACCORDANCE WITH AGRICULTURAL POLICIES ;
30. (I) Paddy lands which have been identified by the Commissioner-General as paddy lands from which the maximum production can be obtained by the cultivation of paddy shall be cultivated with paddy during every season in which paddy can be cultivated thereon. (2) Where paddy cannot be cultivated during any season in an extent of paddy land which has been identified under subsection (I), due to a natural or other cause an agricultural crop which is not a perennial crop may be cultivated on such paddy land after obtaining the written permission of the Commissioner-General . (3) In the case of paddy lands from which satisfactory production can be obtained by the cultivation of any crop other ' than paddy, such paddy land may, subject to the provisions of section 29(5), be cultivated with half yearly crops other than paddy after obtaining the written permission of' the Commissioner-General. For the purpose of cultivating long term crops in such paddy lands, the written permission of the Commissioner-General shall be obtained prior to the commencement of such cultivation. (4) Every person who contravenes the provisions of' this section shall be guilty of an offence under this Act. (5) A certificate issued by the Commissioner -General to the effect that the provisions 01 this section have been contravened, shall be *prima facie* in evidence and shall be prima facie proof of such fact.

32. (I) Any person who, without obtaining written permission from the Commissioner -General- (a) fills up an extent of paddy land with soil or other material or attempts to fill up such extent of paddy land ; (b) uses any extent of paddy land for a purpose other than an agricultural purpose or does any other act for such purpose ; (c) constructs any structure within any extent of paddy land or does any act in furtherance of such purpose ; (d) removes soil from an extent of paddy land or attempts to do so ; or (e) utilises an extent of paddy land in violation of he terms and conditions of the permission issued by the Commissioner-General, shall be guilty of an offence under titles Act. (2) Any person who aids or abets a person in committing any of the acts specified in subsection (1) shall IJC guilty of the same offence. (3) When any person commits an offence under subsection (1) the Commissioner-General or an officer appointed in accordance with subsection (2) of section 38 shall forthwith issue a notice to all such persons involved, to abstain from committing such offence. The exhibition of such notice in or on a prominent place in such extent of paddy land shall be deemed to be service on all such persons. (4) A notice which is exhibited under subsection (3) on any extent of paddy land shall

contain a brief statement giving the nature of the offence committed in respect of that extent of paddy land, and the penalty for which such person could be made subject to the commission of the offence if proved. (S) Where an offence under subsection (I) is being committed by any person or when any course of action is taken to do so, an officer appointed under subsection (2) of section 38 shall complain to the officer in charge of the police station of the area where such extent of paddy land is situated. (6) Upon a complaint under subsection (5) being made the officer in charge of such police station shall take into custody all persons mentioned in such complaint and all persons as he believes are involved in such offence and any implements, instruments, machinery, vehicle or any other article or document. (7) All such persons as are taken into custody under subsection (6) and any implement, instrument, machine, vehicle or any other article or document shall forthwith be produced before the Magistrate's Court. (8) Every person guilty of an offence under this section shall, on conviction after summary trial before a Magistrate, be liable to a tine no1 exceeding one hundred thousand rupees or to imprisonment of either description for a term not exceeding six months. (9) Upon conviction of a person of an offence under this section, the person so convicted shall for every day in respect of which the offence is so continued after conviction be required to pay a fine of one thousand rupees for each such day. (10) Where a person is convicted of an offence under this section, the court may order such person to remove any soil, material or construction with respect to which such offence was committed within such period as may be specified by the court.

http://faolex.fao.org/docs/pdf/srl43285.pdf
SLLRDC legalises further expansion of landfills
SundayTimes Sunday, March 20,2011
By Mirudhula Thambiah
Despite the new regulations passed by the Sri Lanka Land Reclamation Development Commission (SLLRDC) act being gazetted, which incorporates terms and conditions governing legal landfill of low-lying land, marshes, barren or muddy land in the Western Province, landfills have been temporarily stopped because of the massive floods experienced last year, Chairman- SLLRDC, Architect Harshan De Silva revealed

Deputy General Manager- Lands & Marketing, SLLRDC, Hemalatha Prathapage revealed that the terms and conditions gazetted on February 7, 2011, was to formalise land reclamation and development in Colombo, Gampaha and Kalutara districts.

"This is also an attempt to strictly reduce unauthorised landfills in the Western Province," she said. Accordingly, Chief Legal Officer- SLLRDC, Disna Amarasinghe said that owners of lowland, marshes, barren or muddy land, who wish to construct on such land, have to obtain prior written approval of the SLLRDC, consequent to an application to the corporation.

Due process of the application will be subject to the investigative steps taken by the Planning Committee comprising the Urban Development Authority, Central

Environmental Authority, Department of Agrarian Services and senior officials of the SLLRDC.

"The application on a formal application form of the SLLRDC is submitted along with a photocopy of the related title deed and copies of the survey plan of the land referred to in the title deed. Subject to the extent of the land to be filled and its distance from the SLLRDC's head office, an advance payment is payable when the application is submitted. It also entails an initial payment of Rs 3,450," the Chief Legal Officer said.

If an abandoned paddy field or a paddy field under cultivation is to be developed, the SLLRDC directs that applications be made to the Deputy Commissioner- Agrarian Services Department of the district, prior to the application to the SLLRDC.
This application should be submitted to the recommendation of the Local Authority and the Urban Development Authority, along with an approval from the Central Environmental Authority and the Road Development Authority.

Mr. De Silva told the Sunday Times that, after processing the application, engineers of the SLLRDC will conduct a detailed investigation on the survey plan of the land and submit a proposal for the amount of land to be filled, construction of a suitable drainage system, plans for the retention areas and design a suitable drainage system, while testifying sensitive low lands which will not be approved for development.

"A Conditional Letter, with directions to fill the lands, will be issued, and the applicant is granted a period of six months time to fulfil the plan designed by the engineers, while the applicant is also afforded opportunities to extend the scheming period," Ms. Amarasinghe said.

On completion of construction, the engineers will examine the construction, and the planning committee will issue a final clearance certificate to the applicant. According to the terms and conditions under the new regulation of the SLLRDC act, failure to adhere to such terms and conditions, if found guilty in a Magistrate's Court, is liable to a fine not less than Rs.100, 000 and not exceeding Rs.500,000, or imprisonment for a period not exceeding one year or both," the Chief Legal Officer said.

Landfills of low lands, marshes, the barren or muddy land will be further extended to other parts of the island as well, Ms Prathapage revealed. Other than for the Western Province, the SLLRDC has also applied for the expansion of reclamation and development in the Southern Province, to the Ministry of Lands. Once approval is granted, the Land Ministry will gazette the regulations to the SLLRDC act, she said.

ANNEXURE 02

Interviews

01. Deputy Director of Land Use Planning at the Land Use Planning Policy Division (LUPPDJ whose thesis titled "Analysis of the causes of under-utilized paddy lands in Kalutara District, Sri Lanka ".

Practices of rice cultivation are different according to the ecological zones in Sri Lanka. Other than that rice cultivation is also affected by the factors such as land ownership, irrigation pattern, experience of the farmers and availability of capital. But in the wet zone rice cultivation is continuing with a different aspect because it is not a profitable industry as in the dry zone and basically farmers grow rice for the purpose of food security of the farm families. Colombo, Kalutara and Gampaha districts of the Western Province also faced complications such as urbanization and industrialization affect to the rice cultivation and it leads to attitude change of the farmers. Urbanization and industrialization create new opportunities and dense population is more likely to engage in other income-generating activities other than paddy farming in the Western Province. Due to the unpopularity of the paddy farming in the area maintaining of irrigation canals is also neglected by the authorities. These issues combined with problems such as illegal land filling, constructions and improper waste management worsen the situation of paddy farming in the Western Province of the country.

Due to urbanization and 1977 open economic policies, attitudes of the paddy farmers further changed and they tend to practice other income generating activities. Those farmers neglected paddy farming mainly because other income generating activities are more profitable and they utilize the opportunity cost of labour for other jobs such as private sector or government jobs. Other than that establishment of garment factories within these areas increase the other modes of earning such as providing renting places for the workers, providing meals for migrant workers from rural to urban area.

Due to the factors such as low profit, labour shortage, irrigation problems and mainly changing attitudes paddy cultivation is difficult in the wet zone. Therefore, it seems to have some possible solutions of cultivating traditional rice varieties because it needs less attention and less fertilizer but there is an issue of availability of seeds. At present, some non-governmental organizations try to produce these traditional seed varieties with some environment-friendly method of paddy farming using SRI (System of Rice Intensification) method. In this programme the importance of traditional rice, consumption is promoted and creating a market for traditional rice varieties is attempted. Other than that maintaining environment sustainability is also important in the wet zone of the country because most of the time these uncultivated paddy lands are used as water logging areas during the rainy season.

It is also noted that maintaining the environment and economic balance in the area is important. Therefore, experts and the planners in the area raised the issue of zoning because the unproductive land can be turned into productive land if there is any planned programme of identifying areas which can be utilized to growing crops such as banana, high-value timber, and leafy vegetables. Moreover these areas can be utilized as farmlands of duck farming, buffalo farming or freshwater fisheries because these type of activities help to maintain water logging areas essential to environment sustainability of the area.

02. Assistant Commissioner for the Department of Agrarian Development, Kalutara District

All the paddy land issues should report to Divisional Secretariats irrespective of legal status. Because proper method of land filling is the best solution to minimize socio-economic issues arising paddy land filling. This time only 1 percent of illegal filling was recorded and it is a construction of fuel station. That case was reported to the court and the land fillers have to pay about one million penalties for that. So far, only filling in Baduraliya Madurawala, Kalutara Divisional Secretariat Divisions in Bulathsinghala has been approved. This is the best way to prevent illegal fuel stations. If the filling is done on large scale, floods may affect the environmental balance.

03. Assistant Commissioner of the Department of Agrarian Development, Gampaha District

In Gampaha district, the main cultivation season is *Maha* season and during the *Yala* season, only 10 % of the area is asweddumized. Paddy farming in the area is not profitable because the cost of production is very high especially due to the higher requirement of labour. Before 25 years these paddy lands were abandoned due to less profitability and they preferred to use these lands for other profitable activities. Other than that as this area is urbanized and industrialized farmers try to fill the lands because the land value is very high in the area. Paddy land owners in the area try to fill their lands legally or illegally. There are 25 legal applications are received per month for legal filling in the Gampaha district. If the illegal filling occures farmers are subject to legal action and they have to settle the problem in the court and the maximum penalty is around Rs 100,000.

Procedure to legal land filling

i. Collect application from the Agrarian Service Centres and submit the application
ii. Inspection by the responsible officers
iii. Recommendations concerning the extent are collected from different authorities such as D.S. Division, local agriculture and Irrigation Departments and Pradeshiya Sabhas to the District Agrarian Committee (DAC)

iv. The DAC, with members relevant to agriculture and chaired by a Government Agent, set the conditions for approval of filling.
v. The DAC grants the approval after the client fulfilled the conditions

Normally in this method farmers can receive permission for land filling in the Katana area. Other than the above factors when approving the available irrigation channels have to be a concern to secure irrigation facilities for other paddy lands in the area. Moreover environmental conditions are also taken into consideration in land filling issues to minimize the impact of flooding.

04. The Divisional Environmental Officer in the Ja-Ela D.S. Division

Ja- Ela despite being as a highly industrialized area still reports no water pollution issues affecting the paddy farming. Farmers have given up cultivation due to low profitability and high-cost involved in paddy farming. Even though the factory pollutants accumulated in water bodies small scale farmers are not able to raise their voice against it. Land filling occurs illegally with the help of ground level politicians who have political interest. These politicians do not think about the environmental issues. Most of the time due to illegal land filling flooding becomes a common issue as the natural water flowing channels are blocked.

05. The Divisional Environmental Officer in the Biyagama D.S. Division

Although many parts of Biyagama are highly industrialized, polluted water does not seem to be a reason for halting the paddy cultivation. However pollution caused by factories might affect small-scale farming since poor people seem to be powerless. Water treatment plants are being installed, but only to hoodwink the inspections. In actuality pollution still goes on unhindered. In some areas, there is salt-water intrusion through the canals, which is confined to low-lying, coastal areas. The main reason is the lack of profit from paddy cultivation. The inputs, such as fertilizers and hired labour, are expensive and the income from selling rice does not even cover all expenses. Young people are not interested in cultivating paddy. There is no problem with the youth migrating since there is plenty of employment in the industrial estates and Free Trade Zones. However, they prefer the "end-of- the-month-payment", which paddy cultivation could never provide. Additionally, promotion of paddy farming is not properly planned. In certain areas, there have been land fillings since the 1960s. These fillings do not occur at the same time or in the same area but happen over time. With the conversion of marshy lands and construction of roads, flooding became a bigger issue. Beforehand, the floods used to last 2-3 days, now it lingers 2-3 weeks. This causes significant damage to the crop. Soil extraction for filling lands in other locations has made soil erosion increasingly more common, leading to increased siltation on paddy fields. One season of cultivation had to be passed until the paddy fields were cleared again.

Local politicians are only aiming for the next elections and trying to achieve short-term results. Inadvertently, policies these areas tend to promote industrial activities and persuade people to engage in employment over farming. Not only that but also the politicians use their authority to compel Agrarian Service Centres to issue permits for paddy land filling on favouritism disregarding the productiveness of those paddy lands.

06. The Grama Sevaka (Head of Village) in Gampaha district Adiambalama

The total extent of paddy lands is around 58 acres. There are three acres under cultivation. The number of farmers at present reach 50, with majority living in the village itself.

The lands were abandoned 15-20 years ago. The paddy fields were abandoned one by one, originally the abandonment of upper lands causing irrigation problems for lower paddy tracts.

Filling of lands caused issues with paddy cultivation due to blocking of soil in the irrigation system. Canals are blocked, this sometimes leads to an excess of water in some paddy fields where the roots need oxygen and try to reach the surface. This leads to cultivation problems since the roots of rice plants loosen.

Rice cultivation in Adiambalama does not yield profit. Although the previous generation still shows some interest in cultivation, the younger generation does not, predominantly due to low profit. There is barely any financial support from the government, and the current funding is not being properly managed.

The younger generation usually remains in the village, but take external employment, for example, brick making or working in the Katunayake FTZ or garment factories.

The younger generations are not interested in re-cultivating the lands; the older generation, on the other hand, have an interest in cultivation. If the profit in terms of the economy was to be higher and the financial support better, there would possibly be an interest although the priority concern is irrigation.

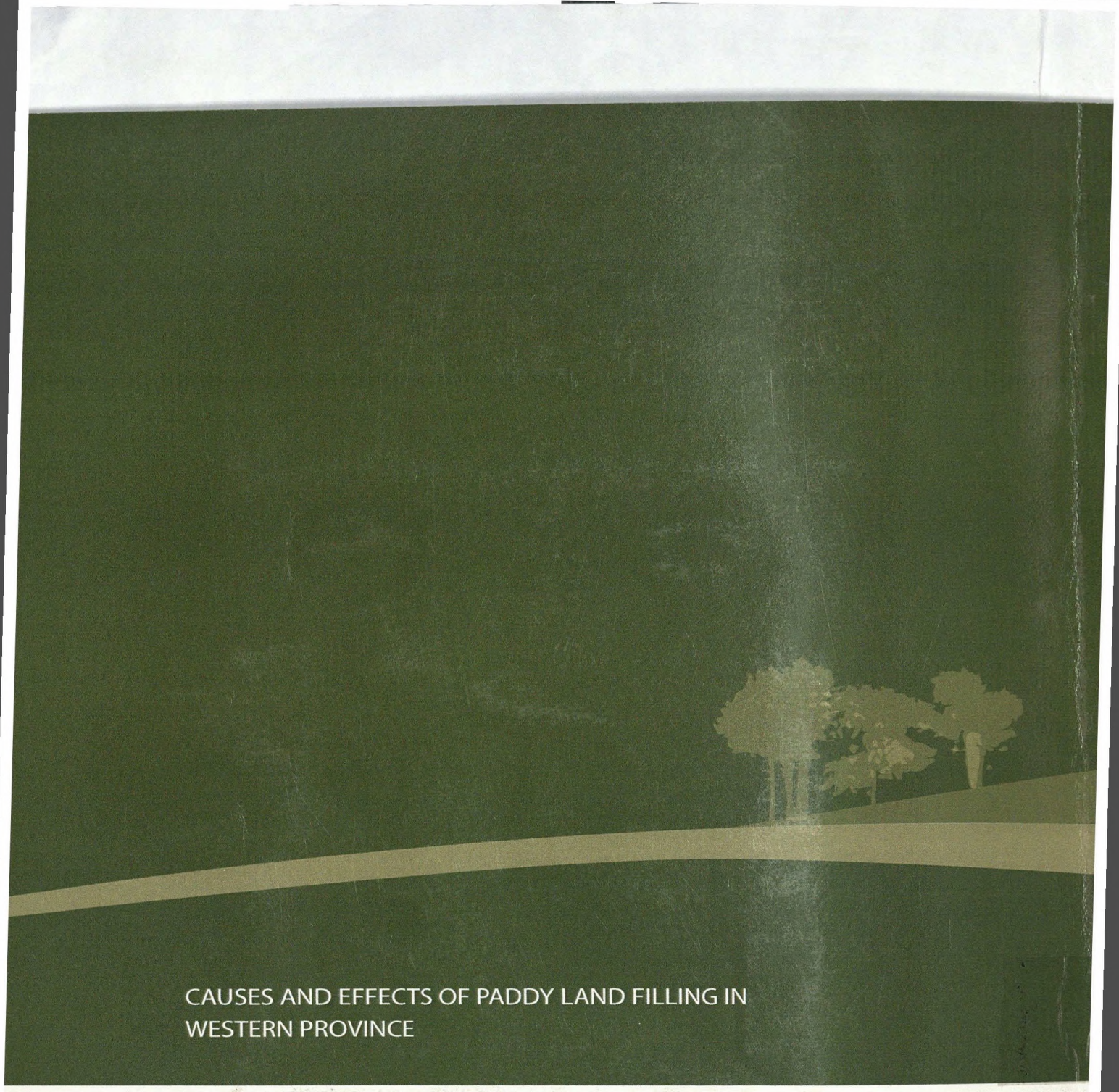
07. Grama Sevaka (Head of Village) in Kondagammulla

i. According to the secondary data available with the government officials at village level, he expressed that 57 acres of paddy land are available in the village but at present only five acres are under cultivation. There are 50 farmers living in the village.
ii. Abandoning of paddy land in the village is occurring in last 10 years and still is in progress. When paddy lands are not cultivated in the higher level of the irrigation channel there is an irrigation problem for the farmlands at a lower level and it causes further abandoning.

iii. Another important factor is the location. This village located close to the industrial area, therefore, the highland value is surging therefore people are interested in land filling illegally or legally in the area and it leads to irrigation problems in paddy farming.
iv. Rice cultivation in the Western province is not profitable but older farming generation prefers to engage in farming and they expect some form of support from the government.
v. The younger generation in the village would show more interest to involve in white collar jobs than farming. They live in the village and rely mostly on the jobs in the industrial sector over farming.
vi. Due to industrialization water bodies in the area are polluted and it further disturbs the irrigation channels which are essential for paddy farming.

08. President of the Agricultural Organization in Kondagammulla

i. The paddy land availability is around 56 acres and at present 50 acres are abandoned and only six acres are being cultivated. Most of the land owners in the village and some land owners living outside the village do not want to cultivate the land or handover to someone who is willing to cultivate.
ii. For the past 20 years, the paddy farming did not take place in the area due to irrigation problems and issues with the high cost of production. Also the younger generation does not show any interest in farming and according to technological advancement new technologies are not introduced and paddy farming has become unpopular. Moreover there is no government support or any other programmes to encourage paddy cultivation in the area.
iii. Younger generation receive better education at present and they prefer to engage in white collar jobs other than paddy farming. More youth remain in the village and they earn more money from other income generating activities. Labour shortage also poses a challenge in continuing paddy cultivation as before since the production is labour intensive and therefore expensive. To face the present day economic crisis the paddy farmers also need a secondary employment and hence paddy farming has become mostly the secondary employment in the areas.
iv. Due to industrialization, some industrial waste is accumulated in the uncultivated paddy lands but it is not the main problem that prevents farmers from engaging in paddy farming.
v. Filling of abandoned land creates water issues because the groundwater level is sinking. However during the time of cultivation there is water. Filling for agri-purposes is not likely since the process is expensive and difficult. Continuous cultivation of small paddy extent has become difficult, canals need to be cleared and animals and pests are a nuisance for the present cultivators. If there is a month with little or no rain, the water level in the wells is bound to sink.



CAUSES AND EFFECTS OF PADDY LAND FILLING IN WESTERN PROVINCE

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