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FOOD CONSUMPTION PATTERNS IN SRI LANKA

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FOREWORD

The patterns of food consumption vary from time to time, according to various ethnic groups living in the country. Their culture, job category, income and internal migration situation are other factors affecting food consumption. In the British era, cheap labour was brought for the plantation industry from South India. Initially the British introduced bread and wheat flour based foods as their main food. Gradually, the consumption of wheat and wheat based food became popular in the country. But during the era of our ancient kings, consumption of traditional food varieties was the norm. Due to high nutritious value of our local food items our ancestors were healthy. After gaining Independence, successive governments paid attention to infrastructure facilities to uplift local agriculture. Some of them were Mahaweli Development Programme, Ama Programme (1995-2000) and the Api wawamu - rata nagamu programme (2007-2010).

It is highly important to conduct research into rural, urban and estate sectors' dietary habits to ascertain whether they are taking a nutritious diet. Although Sri Lanka is rich in many healthy foods like jak, breadfruit, domestic tuber roots, pulses, legumes and fruits, people are not concerned about these food items thus, those foods are wasted considerably. Several by-products can be produced from these food items as done in our ancient society. These food crops are free from applied chemicals, and therefore not harmful to the human body. As our country has a tropical climate, which is also favorable for the growth of above plants, there is no need for artificial chemicals which are harmful to human health. Hence programmes have to be implemented to make people aware of the importance of those crops.

As revealed by the recent statistics, the malnutrition rate of children under five years in rural areas is 30 percent. The availability of food crops in rural areas like green gram, cowpea and soya is not sufficient to meet the domestic need. Meanwhile, the open market retail prices of certain food items are unaffordable for the common people. A high percentage of foreign exchange has to be spent annually on importing some of these food items.

Considering the above reasons, it is timely to conduct a study of this nature to provide information about the food patterns of the people in rural, urban and estate sectors. Hence, I feel the findings and recommendations of this study would be very useful to uplift the local food production and to increase the nutritional intake to build a healthy nation while retaining our valuable foreign exchange within the country.

E.M. Abhayaratne
Director

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EXECUTIVE SUMMARY

Rice is the staple food in rural and semi-urban sectors in Sri Lanka. However, people in estates and urban areas and some Muslims are accustomed to wheat based foods. On the other hand, rural and semi urban people eat rice and rice based food items. Most of the Sri Lankans make so many sweets using rice flour. Wheat flour is used as the main ingredient only in the bakery industry and biscuit industry. From the time of Independence all the governments gave priority to produce more and more paddy.

During the British government, wheat flour was introduced mainly for the food of workers who were brought from South India. Therefore, wheat flour based products became their main food. It has been found that wheat flour is unfavourable for the health as well. As a result, consumption of rice has become more popular again. The present government has taken steps to increase the rice production by spending much money on it. Rice and wheat flour are important in the food sector but tuber roots, cereals, jak, breadfruit are also natural treats. These are highly nutritious. At present, people consume green gram, cowpea, maize, kurakkan, kollu, thanahal as well as manioc and sweet potatoes.

All the people struggle with the time to earn money. From the little schoolchild to wage earner, all are involved in this struggle. Hence the trend is instant foods. To popularize local foods among the people food habits of people in various areas need to be understood.

The main objective of this study is to find out the nutritional value and sustainability of foods to promote food policies. Specific objectives are (1) to study food habits in different areas and among different communities, (2) to analyze various socio-economic factors-affecting food habits (3) to examine preference of consumption of rice, rice based foods, wheat flour foods (4) to investigate preference of traditional, local tuber roots, and their present consumption condition (5) to make suggestions for diversification of food habits.

A semi-structured questionnaire was administered to observe the current food consumption patterns. Consumer areas were selected from seven districts including producing and consuming areas. Producing areas included one major irrigation area and one minor irrigation area. Under consuming areas one location was selected for the estate sector and one for the shanty community while two locations were selected to represent the semi urban population. The study mainly focused on the semi structured questionnaires. Separate questionnaire called the questionnaire of seven-day-diet diary to get the details on quantitative food consumption was also administered to the sample.

Three categories were examined i) members staying at home ii) member engaged in employment iii) Persons or students involved in studies. Consuming patterns of rice, green gram, cowpea, kurakkan, maize, subsidiary food crops, local tuber roots, jak, breadfruit was investigated under the study. In addition, 10 households were selected to administer the questionnaire of seven day-diet diary to examine the quantity consumed. According to the findings, in rural producing villages 84% of people staying at home eat rice for breakfast, 95% for lunch and 78% for dinner. In semi-urban areas percentages of people who eat rice were 57% for breakfast, 93% for lunch and 73% for dinner. Rice is consumed by the category of people staying at home in urban shanties. (Only 3% for breakfast 89% for lunch and 75% for dinner). Meanwhile, some wheat flour based foods are also included in the diet. The diet of persons who are employed and engaged in studies is also similar to this pattern. Rice consumption in remote areas is higher than the people living in semi urban areas. A lesser consumption of rice could be seen among estate people and the semi urban poor people.

The findings of the seven day-diet diary reveal the food habit patterns in producing areas and consuming areas. The number of main meals of a family is 210 for a week. (21 meals x 10 households is the weekly consumption of a family) In producing areas for 96% -98% of meals, rice has been consumed. In semi-urban areas it varies between 65% - 83% while it is nearly 50% for low income groups.

Consuming of subsidiary food crops like green gram and cowpea seemed to be high in producing seasons.

Jak, breadfruit and local tuber roots are very common in Sri Lanka. These crops are not consumed as a main meal, but as a part of a meal.

When considering the quantity, 06 per capita consumption of urban shanties show about 78.6 grams per day. The highest per capita consumption is shown in rain fed areas and that is about 387.7 grams/day.

In terms of the consumption of wheat flour based foods, per capita consumption is the highest among tea estate workers. The survey revealed it as 247 grams/day. In the case of people under Chena cultivation, it has decreased to 30 grams/day.

The study reveals that the least consumption of milk is among estate and Chena cultivators. The consumption of fruits is generally very low. This is significant among the estate people, chena cultivators and people in urban shanties. People in the study area under minor irrigation in the Anuradhapura district consume plenty of sugar in their day-to-day life. Overall sample reflects that they must be given awareness about the appropriate quantities which they have to take for a healthy life.

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CHAPTER ONE

Introduction

1.1 Background

Rice had been an integral part of the Sri Lankan food culture from ancient times. Rice and vegetables constitute a larger proportion of the Sri Lankan diet and animal based food comprises only a little. Successive governments primarily focused on increasing domestic paddy production to secure nutritional needs of the growing population. Owing to this fact, the country had reached near self sufficiency in rice, the staple food of nearly 20 million people since late 80s. Currently 40% calorie and 30% protein demand of an average Sri Lankan is mainly met by consuming rice. The second staple food is bread and the requirement of wheat, is totally met by imports. However, wheat flour based fast foods have become popular in Sri Lanka in the recent decades. (Table 1.1)

According to the Central Bank of Sri Lanka (Consumer Finance and Socio Economic Survey) and the Department of Census and Statistics (Household Income and Expenditure Survey) the per capita consumption of rice has shown a continual increase in the recent decades with the increasing rice production in the country. It has increased from 103.7 kg in 1986/87 to 107.9 kg in 2006/07. The trend of consumption of wheat based products on the other hand, has come down to 25.3 kg per person during 2006/07.

Table 1.1: Annual Per Capita Consumption of Staple Foods-(Kg)

Food Item	1986/87	1996/97	2003/04	2006/07 ¹
Rice	103.7	106.1	106.2	107.9
Wheat flour	8.8	10.0	9.4	7.0
Bread	22.5	31.9	21.1	18.3
Total wheat	31.3	41.9	30.5	25.3

Source: Consumer Finance and Socio-Economic Survey, Central Bank of Sri Lanka
1-Household Income and Expenditure Survey-Dept. of Census and Statistics

Population growth in terms of number and biological differences affect the quantity and quality of food demand. Factors such as increasing income, greater marketing facilities with urbanization and increasing number of working mothers influence the pattern of food consumption. They are important factors that change the food habits and subsequently the food demand. As income rises, consumers desire a variety in diet and quality in food intake making non-staples more important. At higher income levels, taste and health factors too play an important role in making consumption decisions. Changes

in earnings, lifestyle and marketing facilities with urbanization influence the consumer food patterns towards more convenient foods. Yet rural poor consumers tend to retain a diet with a higher portion of staples. There is also a general trend that food that requires minimum preparation time has a higher demand in the context of rising incomes and congested urban lifestyles. Wheat flour has the added attraction in terms of food preparation. With rising standards of living, western eating patterns have become more popular. Food consumption patterns in any country are generally considered to be an important indication of development changes. The behavioral pattern in food consumption relates to the stage of development. Sri Lanka is no exception in this general trend. On the other hand, localized food consumption patterns are mostly influenced by availability of food varieties and ethnicity related food cultures and food taboos.

In Sri Lanka particularly in the rural sector, rice comprises the main cereal food commodity and the rural consumer had benefited from increased rice production in the country. Yet, among urban communities, wheat constitutes a considerable proportion in their diets for which the country has to depend on imports. Developing a local food sector and popularizing local food among people to meet the nutritional needs of the population is a policy with multiple objectives. Prior to formulating the agriculture and food policy towards development of a local food sector for nutrition security, it is important to be acquainted with the underlying factors that determine the food consumption patterns of different communities.

1.2 Main Objective of the Study

The main objective of the study is to identify the food consumption patterns in Sri Lanka and its determinants in order to design production and marketing policies of traditional food crops promoting food and nutritional security.

1.3 Specific Objectives

The specific objectives of the study are

- 1. To study underlying socio economic factors influencing consumption behavior among different communities.**
- 2. To study the rice consumption pattern and factors determining rice over wheat based products.**
- 3. To study the current consumption behavior of traditional subsidiary food crops: tuber root, pulses and other traditional starchy food crops.**
- 4. To assess the dietary diversity and nutritional value of different diets of the Sri Lankan communities.**

5. To derive policy options for designing production, processing and marketing policies to develop a local food sector for food security in Sri Lanka.

1.4 Organization of the Report

The first chapter enlightens the readers on the value of rice as a source of nutritional supply. Methodology of the study is explained in the chapter two. This chapter explains the

- a) Factors influencing the selection of study locations
- b) Description of the study locations during the period of survey

Chapter three explains the food consumption behavior of different communities in Sri Lanka.

Chapter four gives a vivid description of the production and consumption patterns of rice in Sri Lanka. The significance of rice: the staple food of people in their daily meals is shown in graphs.

Chapter five is based on the consumption of other food crops, the types of cereals and pulses that substitute rice.

Chapter six presents a description of food consumption patterns at households level and their nutritional status.

Chapter seven brings out the findings and recommendations of the study.

CHAPTER TWO

Methodology

This is an exploratory study on food consumption patterns of different communities in Sri Lanka. Therefore, the study has been focusing mainly on understanding variations in food consuming patterns and factors affecting food consumption. In order to achieve the objectives of the study, the following methodological approach has been adopted in selecting the sample.

2.1 Factors Considered for Selection of the Study Locations

Food consumption in different localities is determined by many factors such as availability of food, stability of food supplies, market integration, household income, ethno-cultural related eating habits, food preparation methods and intra-household food consumption habits. Particularly in Sri Lanka, regional food availability, ethno-cultural food habits and degree of urbanization determine the staple food in the diet of an individual. Mainly rice based food cultures are common among rural communities. Wheat based food cultures are common among predominantly Tamil estate communities, Jaffna people and urban population. In addition, household income, time availability for cooking and the understanding of diet's role in health are some of the factors that determine the food consumption pattern. State intervention in controlling food prices, food industry performances, development of food retailing and the effects of growing international trade and globalization of tastes have become increasingly important determinants of urban food habits.

2.2 Study Locations

In selecting study locations, above mentioned factors were considered to gain an understanding of the food consumption patterns under different community settings. The primary factor considered was food availability in terms of food production and food availability by means of markets. In the first step, main producing areas and consuming areas were chosen. Secondly, of the main producing areas, paddy producing areas and subsidiary food crops producing areas (rainfed/chena) were selected. Of the main consuming areas, urban-rural-dichotomy, income and the ethnicity related factors were considered. Urban high income, urban low income and semi-urban areas as well as estate areas and Muslim majority areas were considered. Accordingly the main districts selected for the field study are as follows.

- i. **Consuming Areas**
Colombo district
Kandy District
Nuwara Eliya District

- ii. **Paddy Producing Areas**
Anuradhapura District
Polonnaruwa District

- iii. **Rainfed/Chena Areas**
Kurunegala District
Monaragala District

2.3 Data Collection Methods

Data collection was carried out by using a semi-structured questionnaire. In addition, a questionnaire of seven day diet diary, a few case studies and interviews with occupational and social groups, key informants in study locations were also conducted. Secondary data resources mainly the Household Income & Expenditure Surveys (HIES) of the Department of Census and Statistics and the Consumer Finance and Socio Economic Survey (CFSE) of the Central Bank were also utilized to obtain a general picture of food consumption patterns.

2.3.1 Questionnaire Survey

A semi-structured questionnaire survey was conducted representing different communities to understand their current food consumption patterns. A total of 347 households were selected randomly representing main communities from seven districts for the survey. Stratification was done at DS level and at GN level as given in table 2.1.

2.3.2 Structure of the Questionnaire

The questionnaire consisted of inquiries on key characteristics of the household, the social background and related information with their food preparation and food habits. The study mainly focused on obtaining information about their food consuming habits, consuming patterns and changes regarding consumption of rice, bread, wheat flour allied foods, rice flour allied foods, cereals and yams. This semi-structured questionnaire did not provide quantitative measures of the diets. To fill the gaps in the information on such quantitative measures, a seven day diet diary questionnaire was administered in order to obtain specific details.

2.3.3 The Questionnaire of the Seven Day – Diet Diary

Information was gathered from 10 households per each study location. Hence it was targeted to collect 80 questionnaires from the eight locations.

Table 2.1: Size of the Location wise Sample

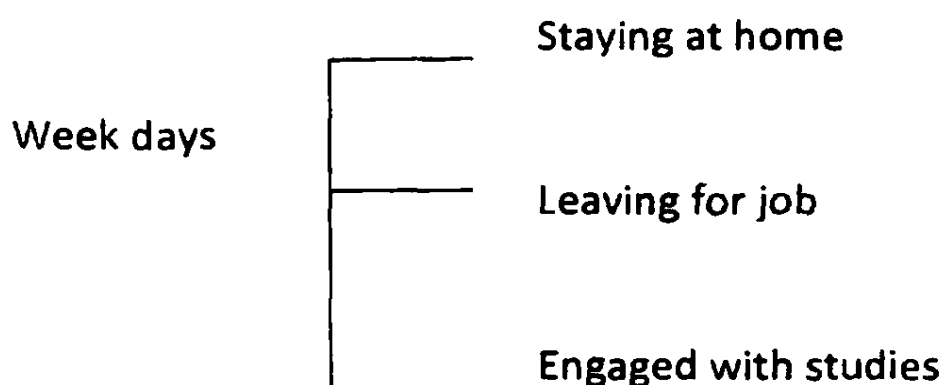
Main Community	District	DS	GN	Sample Size
Paddy farming communities under major irrigation	Polonnaruwa	Hingurakgoda	Hatamuna	50
Paddy farming communities under minor irrigation	Anuradhapura	Ipalogama	Manewa	50
Paddy farming communities under rainfed conditions	Kurunegala	Galgamuwa	Kalegama	50
Chena Farmers	Monaragala	Siyambalanduwa	Wattegama	50
Semi-urban middle income dwellers	Colombo	Kaduwela	Malabe North	37
Estate Tamil Community	Nuwaraeliya	Nuwaraeliya	Ruwaneliya	50
Lower Income urban dwellers in Shanties	Colombo	Colombo	Hunupitiya	30
Muslim Communities	Kandy	Udapalatha	Illawathura	30

2.3.4 Case Studies

A few case studies were conducted while administering the questionnaire survey to get an insight of the issues to be addressed in the study. Previous studies have shown that this approach has been very effective particularly in relation to behavioral studies.

2.3.5 Categorization of Data Collection

The information was collected in three groups.



In addition, information for three meals; breakfast, lunch and dinner were collected separately. Dinner was important as all the members in the family consume dinner together.

2.4 Limitations of the Study

The field survey was conducted from August 2008 to December 2008.

Food pattern varies in countries like Sri Lanka due to multi ethnic cultures. Hence the Northern Province where Tamils are predominant also has to be included in the sample. However, due to unavoidable circumstances such as the conflict situation, limitation of time and insufficient resources, the Northern Province could not be included in the sample.

The *Cinnamon Gardens* in Thimbirigasyaya Divisional Secretariat in the Colombo District was initially selected to represent the higher income group. Researchers made several visits to the sample households, but could not meet the occupants, therefore *Cinnamon Gardens* was dropped as a study location.

CHAPTER THREE

Food Consumption Behavior in Sri Lanka

Food is part of culture and the diets evolved over time in different localities are influenced by many factors and complex interactions. Actual food availability may vary by region and season. Socio-economic level and income, prices, individual preferences and beliefs and cultural traditions shape dietary consumption patterns. This chapter reviews the food consumption behavior of the communities in the selected study locations through information gathered both by the questionnaires survey and seven day diet diary questionnaires. Consumption patterns in the main food producing areas are reviewed based on information from the study locations; Hatamuna, Manewa, Kalegama and Wattegama and the main consuming areas are reviewed based on information from the study locations; Malabe, Hunupitiya, Illawathura and Ruwan Eliya.

3.1 Main Food Producing Areas – Rice Dependent Regions

3.1.1 Study Location 1: Hatamuna

District: Polonnaruwa

DS division: Hingurakgoda

GN division: Hatamuna

3.1.1.1 Socio Economic Setting

Hatamuna is one of the main paddy producing areas in the Polonnaruwa district. Hatamuna is a command area under the *Minneriya* major irrigation scheme fed by *Minneriya* reservoir which was established in 1946. Current population represents the third generation of settlers and majority of them are Sinhalese Buddhists. Most of the families have 3-6 family members and the dependents represent 33% of the population. Almost all the population is literate and 25 % of them have passed the GCE O/L while majority of the population is educated up to 6-10 grade.

Paddy farming is the main livelihood in the area and 45 % of the employed population either cultivate their own land or is employed as agricultural labourers as their primary occupation. As lands they owned are fragmented and new immigrant dwellers do not have their own agricultural lands, they have been compelled to work as wage labourers in agricultural or non-agricultural sector. Skilled jobs such as carpentry and masonry are popular among the youth in the area. Employed male population in this area is 77, while the employed female population is 28.

This economic setting of the area represents an average rural agricultural area in the country. The annual average income is Rs. 318, 807. The minimum and maximum annual average income is Rs. 22,680 and Rs. 887,660 respectively. They spend 25% on food, out of the total income. According to income levels, about 27% of the population remains below the national poverty line.

3.1.1.2 Source of Food Supply and Food Expenditure

The dwellers in Hatamuna spend 25% of their total annual expenditure on food while they have their own productions of paddy, coconut and other food items. They keep a portion of their paddy harvest for daily consumption. A few families in the sample depend on nearby markets for rice. Home-garden is the main source of supply for leafy vegetables and it supplies part of their daily requirement of vegetables and yams as well. For other grains, meat, fish and dry fish they totally depend on markets (Table 3.1).

Table 3.1: Source of Food Supply – Hatamuna

		Main food	Vegetable	Leafy vegetable	Cereals	Yams	Meat fish/d. fish	Other
Hatamuna	H.G.	4	22	79	2	46	-	78
	Paddy F.	76	4	-	-	-	-	-
	Market	29	85	50	100	79	100	56
	Neighbours	4	8	13	-	6	-	-
	Other	-	2	-	-	-	-	-

Source: HARTI Survey data - 2008/09

3.1.1.3 Food Habits

Being a traditional paddy farming area, they are accustomed to consume rice for all three meals of the day as the main food. Consumption of other grains like kurakkan, green gram, cowpea and maize is not common in the area. Majority of the households prepare meals 3 times a day and those who prepare meals twice a day prepare breakfast and lunch together. Some prepare rice flour or kurakkan flour based foods like string hoppers, pittu, rotti for dinner. Family members who leave home for studies in the morning sometimes eat breakfast outside. But often they take rice and curry for their breakfast and lunch from home. (Table 3.2)

Some 90 percent of members staying at home, eat rice for breakfast. Ninety seven percent of members involved in jobs and 75 percent engaged in education also consume rice for breakfast. Lunch is entirely covered by rice and the dinner is rice for 80 percents in all the three categories. The rest 20 per cent eat multi foods such as rice and wheat flour based foods. Several households in the sample, that do not have their own paddy

lands, engage in agricultural and non agricultural daily earning activities. Hence they depend on the market. Therefore, they eat more wheat flour based food items. The farm families, as an alternative to monotonous food pattern, eat rice flour based foods like pittu, rotti, string hoppers for both breakfast and dinner.

Table 3.2: The General Food Habit Situation in Hatamuna

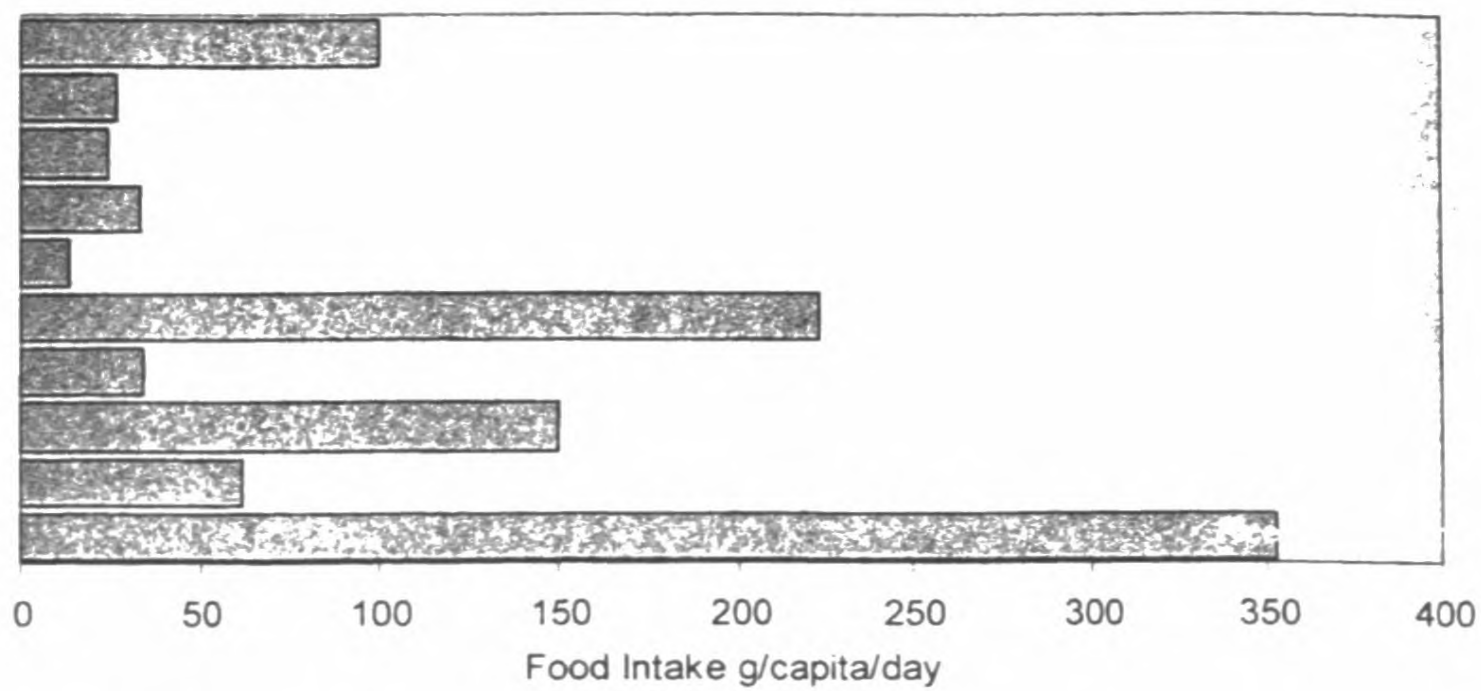
Category (House holds)	Breakfast							Lunch			Dinner			
	Rice	Bread	Rice Fl.food	Wheat Fl.Food	Cereal	Yams	Multi Foods	Rice	Bread	Multi Foods	Rice	Rice Fl. food	Wheat Fl.Food	*Multi Foods
Staying at home	90	-	-	-	-	-	10	100	-	-	78	02	-	20
Engaging in jobs	97	-	-	-	-	-	03	100	-	-	80	-	-	20
Engaging in studies	75	-	-	-	-	-	25	100	-	-	78	02	-	20

*Multi Foods - Green gram, Cowpea, Kurakkan Flour Foods, Rice Flour Foods, Maize, Rice, Bread, Wheat Flour Foods & Yams.

Source: HARTI Survey data – 2008/09

Mostly cowpea and green gram are eaten as a curry with rice. The householders in this study location rarely cultivate cereals. They are compelled to purchase those items from the market.

3.1.1.4 Food Consumption Pattern and Food Intake : Hatamuna



Source: HARTI Survey data 2008/09

Figure 3.1.1: Food Consumption Pattern and Food Intake

The figure 3.1.1 reveals that the communities at Hatamuna consume nearly 350g of rice and rice based foods, 150g of coconuts per day as an energy source. Their daily intake of fruits and vegetables seems to be about 340g per capita per day, below the recommendation of WHO (400g per day).

Polonnaruwa is a major paddy producing area in the island under major irrigation. In such areas, the consumption of rice is at a higher level. In Hatamuna, the per capita rice and rice based consumption is also high (351.8gms), while the consumption of pulses is also at a moderate level which is 33.9gms. Fish consumption is nearly double when compared with meat consumption (33.2gms and 13.5gms respectively). Per capita consumption of fruits is nearly 100gms, keeping at a satisfactory level. As these areas are self sufficient in old fruit varieties people have to be persuaded to consume more and more fruits in their day-to-day diet.

3.1.1.5 Mrs. Nilmini Damayanthi – Hatamuna – Hingurakgoda

I am a married woman and my husband is working abroad. I have two children. I started preparing some food varieties since 1995. I first started to prepare wandu and string hoppers from rice flour in 2005. I have a small tea boutique. I can normally sell about 90 'wandus' per day. In the land preparation season and harvesting season the demand is high. On a normal day I could sell about 90 wandus and during the field working season it is about 100. The food variety of wandu is popular among farmers, schoolchildren and other employed people as a suitable food item for breakfast. The price is Rs.10.00 each.

Besides wandu, I prepare string hoppers also. Normally I could sell about 60 string hoppers using 750g wheat flour. During the season of paddyfield work, the demand for string hoppers is high. So I prepare string hoppers using one kilo of wheat flour. The farmers buy string hoppers to serve with tea for the labourers who work in their fields. I charge one rupee per string hopper.

I started to prepare 'pancake' in the year 2007. I prepare about 25 pancakes in the morning. The customers of pancakes are schoolchildren. I sell a pancake at Rs.12.00.

I also started to prepare milk rice since 2008. I prepare about 20 pieces of milk rice per morning. I use 1kg rice of raw white and one coconut. I sell one piece of milk rice with lunumiris at Rs.15.00. The regular customers of our boutique buy milk rice. Sometimes schoolchildren also buy milk rice.

I started to prepare other food items like 'Halapa' and hoppers. I prepare about 15 halapa per morning. The price of one is Rs.15.00 and the customers are schoolchildren. I prepare hoppers in the morning and evening. I use rice flour to prepare hoppers. The customers are ordinary people who come to our boutique. I prepare special food items for sale in the boutique. I get up at 1.00 a.m in the morning and work till 6.00 p.m.

This case study reveals that in agricultural areas like Hatamuna, there is a good demand for rice flour based foods like string hoppers, hoppers, vandu and milk rice. The customers who patronized her came from all types of the population.

3.2.2 Study Location 2: Manewa

District: Anuradhapura
DS division: Ipalogama
GN division: Manewa

3.2.2.1 Socio-Economic Setting

Manewa is one of the paddy producing areas under minor irrigation. The water for cultivation is received from the Manewa cascade system in Ipalogama. Manewa is a traditional Sinhalese Buddhist village. Both paddy and subsidiary food crops are cultivated. Most families comprise of 3-6 family members. Almost all the population is literate (98.5) and 23% of them have passed the GCE O/L while the majority population is educated up to 6-10 grade.

Paddy farming is the main livelihood in the area and 48% of the employed population either cultivate their own lands or are employed as agricultural labourers. Considerable percentages work in the government sector, in Armed Forces and in the private sector. Self-employment and skilled job percentage is significantly low. The employed male population is 59, while the employed female population is 35. The ratio between employed male and female is approximately two to one.

The area represents an average rural agricultural settlement in the district. The average monthly income of a household is Rs.23,654 and approximately 18% out of that is spent on food. About 35% of the population remains below the national poverty line.

3.2.2.2 Source of Food Supply and Food Expenditure

Manewa is a traditional agricultural village and people's rice consumption is at a high level. The villagers spend only 18% on food from their annual total income as they have their own production of paddy, coconut and other subsidiary crops. Wheat flour consumption is extremely low. Homegarden is the main source supplying leafy vegetables and part of their daily requirement. However, daily requirement of fish, meat, dry fish and grains other than rice, depends on the market. However, this consumption pattern is changing because chena cultivation is gradually decreasing with the increasing population.

Table 3.3: Source of Food Supply

Source	Main food	Vegetable	Leafy vegetable	Cereals	Yams	Meat/fish/d.fish	Other
Home.G	4	44	88	7	29	-	92
Paddy.F	90	8	20	2	-	-	-
Market	8	80	20	70	67	98	33
Neighbors	-	10	10	30	-	-	8
Chena	2	30	6	12	13	4	-

Source: HARTI Survey data – 2008/09

3.2.2.3 Food Habits

According to the sample, Manewa villagers predominantly consume rice for all three meals of the day as the main food. This study data describes rice consumption percentage of three meals. Rice consumption for breakfast, lunch and dinner is 82%, 94%, and 74% respectively for those staying at home. It is 69%, 94% and 74% among those engaged in jobs. Percentages of those engaged in studies are 75%, 94%, and 74%. Consumption of other food items such as green gram, cowpea, kurakkan flour based foods, rice flour based food, maize, bread, wheat flour foods and yams is not common in the village. Family members who leave home to study and employment consume breakfast outside.

Table 3.4: The General Food Habit Situation in Manewa

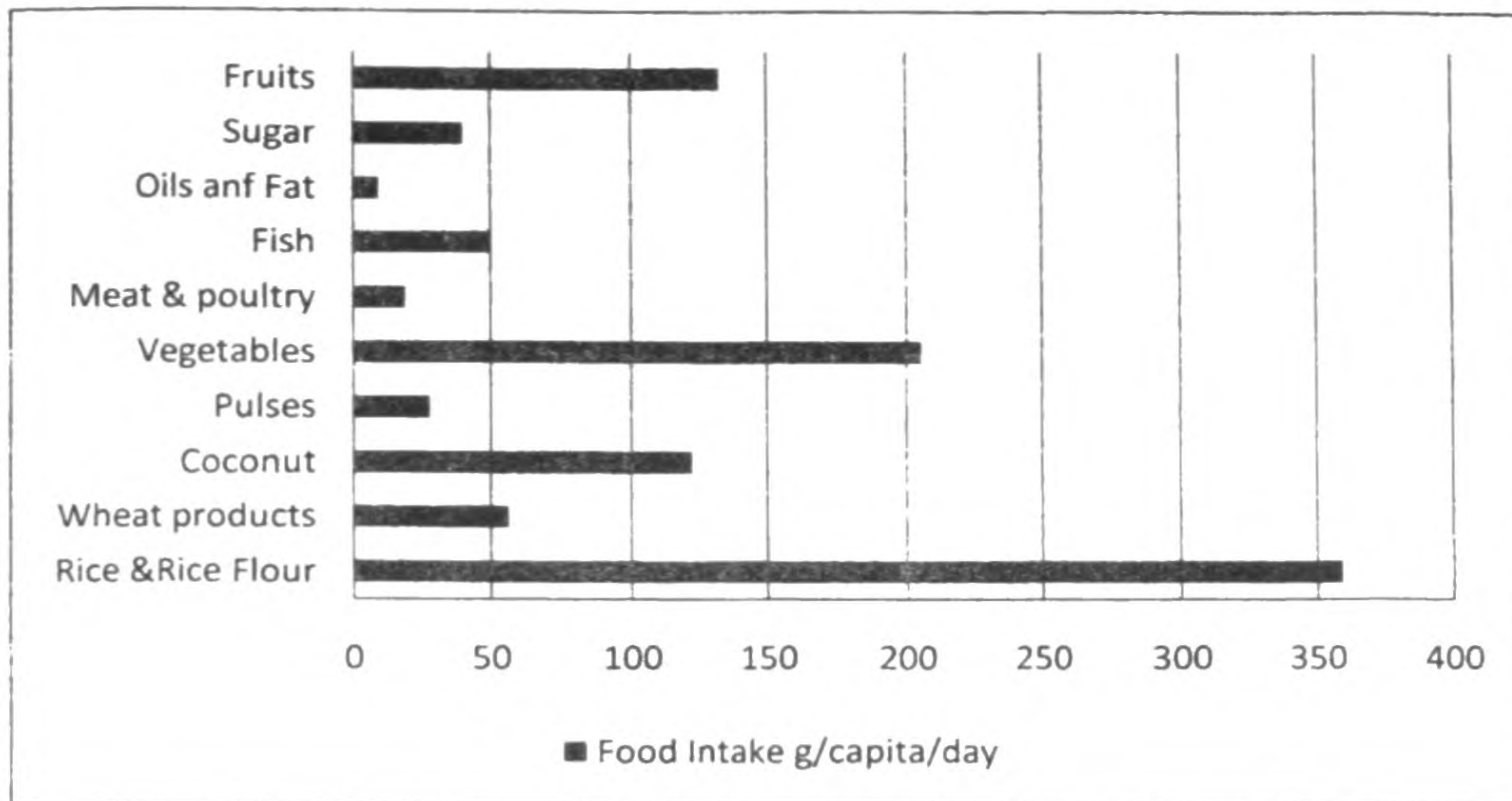
Category (House holds)	Breakfast							Lunch			Dinner			
	Rice	Bread	Rice Fl.food	Wheat Fl.Food	Cereal	Yams	Multi Foods	Rice	Bread	Multi Foods	Rice	Rice Fl. food	Wheat Fl.Food	*Multi Foods
Staying at home	82	-	-	-	-	-	18	94	-	06	74	02	-	24
Engaging in jobs	69	03	-	03	-	-	25	94	-	06	74	02	-	24
Engaging in studies	75	-	-	-	-	-	25	94	-	06	74	02	-	24

*Multi Foods - Green gram, Cowpea, Kurakkan Flour Foods, Rice Flour Foods, Maize, Rice, Bread, Wheat Flour Foods & Yams.

Source: HARTI Survey data 2008/09

As Manewa is a traditional agricultural village, their rice consumption is high. Every one eats rice for lunch and dinner, breakfast is usually rice flour based foods mainly string hoppers or rotti. In Manewa, according to the above table, rice and rice based foods were eaten for 96% main meals out of 210 main meals on seven days in ten households.

3.2.2.4 Food Consumption Pattern and Food Intake: Manewa



Source: HARTI Survey data, 2008/09

Figure 3.2.1: Food Consumption Pattern and Food Intake

Manewa is a paddy producing area under minor irrigation. Hence the residents have sufficient rice for their day-to-day consumption. So the per capita consumption of rice and rice based foods is high. It is 359.2gm. There is low consumption of 56.3gm of wheat flour based products. Their homegardens produce fruits and vegetables and whatever they can grow and consume. As a result, their per capita consumption of fruits and vegetables is 132.3gm and 205.4gm thus shows a satisfactory level. Fish consumption of the people is higher (50.2gm) than the meat or poultry consumption (19gm).

3.2.2.5 Case Study – R.M.H. Chandrasekera, Manewa

My name is R.M.H. Chandrasekera and I was born in 1951. My native place is Manewa in Anuradhapura. I have half a bottle of cow's milk with a kurakkan rotti weighing about 250gm for breakfast. We have a herd of about 30 cows. Early morning father, sister and I collect milk from the cows. Thereafter we go to the chena or the paddy field. Our chena is about 20 acres. Chena cultivation season is from mid June up to October. The peak harvest is in February. There are 5 chena *yayas* (fields) of this type in the locality. About 30-40 people (males and females) work in these *yayas*. In these *yayas* all work co-operatively without selecting personal plots. The paddy field is about 200 acres. About 50 households work in the *yaya* system. Leasing is not practised. Paddy fields have personal ownership. If someone can not cultivate during a season, it is given to another. *Yala* harvest is from August to September. In August tanks get dried. Hence inland fish is available in the village. A group of about 50 houses exchange meat and fish. No purchasing system is in operation. No restrictions in hunting wild animals. Beef is not eaten by the villagers.

We do not carry meals to the chena or paddy field. When we get tired, we drink water from the canal. No chemicals were added to that water. It is very pure. We eat lunch at about 2.00 p.m. Women bring it to the fields. Villagers eat enough meat of wild animals such as wild boar and deer. Those are common for lunch. Lunch consists of kurakkan pittu. (a piece is about 750 gm) and wild meat. We return home at about 5.00 p.m. Then we bring all the cows to their cattle-sheds. For dinner, we eat rice, inland fish, long beans and pumpkin. Paddy is from our own fields, and is prepared in hand-mills. Protecting paddy from elephants is a huge problem. As a solution for this problem, we have to stay in *pela* (a small hut on a tree) in the paddy field.

We get milk from cows and it is consumed by the household members. We make ghee, curd out of the extra milk while *dunthel* is made out of buffalo milk. This is used as a medicine and in cooking. *Dunthel* and ghee can be eaten as butter with kurakkan rotti. On Poson Poya day we hire 5-6 bullock carts, and all the villagers go on pilgrimage to Mihintale. So many local sweets were taken there. Main sweets such as thala aluwa, *aggala* made from jak seeds and kewum and banana are popular. For alms-giving in the village, a special group of villagers make a special sweet named *vellavahum*. They make it without the knowledge of outsiders. In addition, *konda kawum*, *geen gram kavum*, *asmee*, *aluwa* and *aggala* are also prepared.

Up to now the village has sufficient foods of all kinds such as rice, vegetables, tuber roots, legumes, meat and fruits. The villagers' main occupation is farming as well as livestock keeping. Farming is done in wetland, highland and chena. Due to self sufficiency, the health condition of the villagers has also improved. Their unity is also significant.

3.2.3 Study Location 3: Kelegama

District: Kurunegala

DS division: Galgamuwa

GN division: Kelegama

3.2.3.1 Socio Economic Setting

Kelegama is a conventional village situated in the dry zone in the Kurunegala district. Majority of people cultivate paddy and chena crops. Some householders are engaged in the pottery industry too. They have a small portion of paddy lands. Due to limited time engagement in the chena cultivation is low. Therefore crop production has severely decreased and it has affected the food consumption pattern in this area. The current population is Sinhalese and 96% are Buddhists. Most of families have 3-6 family members. Almost all the population is literate (98.4) and 18% of them have passed the GCE O/L while majority of the population is educated up to 6-10 grade. Pottery industry is the main livelihood in the area and 56% of the employed population is involved in pottery. Government sector employees are 10%, Forces 4% and private sector 10%. Skilled job percentage is significantly high. Employed male population in this area is 66%, and females 44%. The ratio between employed male and employed female is approximately 5 to 1. The economic setting of the area represents an average rural agricultural area. The average monthly income of a household in Kelegama is Rs.21,153 while the minimum income is Rs. 1,692 and the maximum is shown as Rs.75,000. The average expenditure on food is 25% from the total income. According to the income, about 27% of the population remains below the national poverty line.

3.2.3.2 Source of Food Supply and Food Expenditure

Kelegama is a conventional village. The inhabitants' rice consumption is high. They have their own production of paddy. However, involvement in paddy sector is very low (13%) Coconut is cultivated as a subsidiary crop. Wheat flour consumption is prominently low. Homegarden is the main source supplying leafy vegetables. But, the daily requirement of fish, meat, dry fish and other grains are bought at the market. However, this consumption pattern has changed as the chena cultivation has gradually decreased with the increasing population.

Table 3.5: Source of Food Supply

Source	Main food	Vegetable	Leafy vegetable	Cereals	Yams	Meat/fish/d.fish	Other
Home.G	6	22	83	12	29	-	44
Paddy.F	74	-	15	-	3	-	11
Market	28	90	27	76	74	100	44
Neighbors	2	2	15	-	-	-	-
Chena	4	16	4	21	9	-	-

Source: HARTI Survey data, 2008/09

3.2.3.3 Food Habits

According to the sample, Kelegama villagers predominantly consume rice for all three meals of the day as a main food. This study data shows rice consumption percentage of three meals. Breakfast, lunch and dinner is 84%, 100%, and 92% respectively for the persons staying at home. Rice consumption by those engaged jobs is 88%, 100% and 90%. Those engaged in studies consume 90%, 96%, and 90% other foods such as green gram, cowpea, kurakkan flour foods. Rice flour food, maize, bread, wheat flour foods and yams are not common in the village. Family members who leave home for studies and employment have to get breakfast from outside sources.

Table 3.6: The General Food Habit Situation in Kelegama

Category (House holds)	Breakfast							Lunch			Dinner			
	Rice	Bread	Rice Fl.food	Wheat Fl.Food	Cereal	Yams	Multi Foods	Rice	Bread	Multi Foods	Rice	Rice Fl. food	Wheat Fl.Food	*Multi Foods
Staying at home	84	-	-	-	-	-	16	100	-	-	92	-	-	08
Engaging in jobs	88	-	-	-	-	-	12	100	-	-	92	-	-	08
Engaging in studies	90	-	-	-	-	-	10	100	-	05	90	-	-	10

*Multi Foods - Green gram, Cowpea, Kurakkan Flour Foods, Rice Flour Foods, Maize, Rice, Bread, Wheat Flour Foods & Yams.

Source: HARTI Survey data 2008/09

The survey data shows that rice and rice based foods are eaten for 97% main meals on seven days.

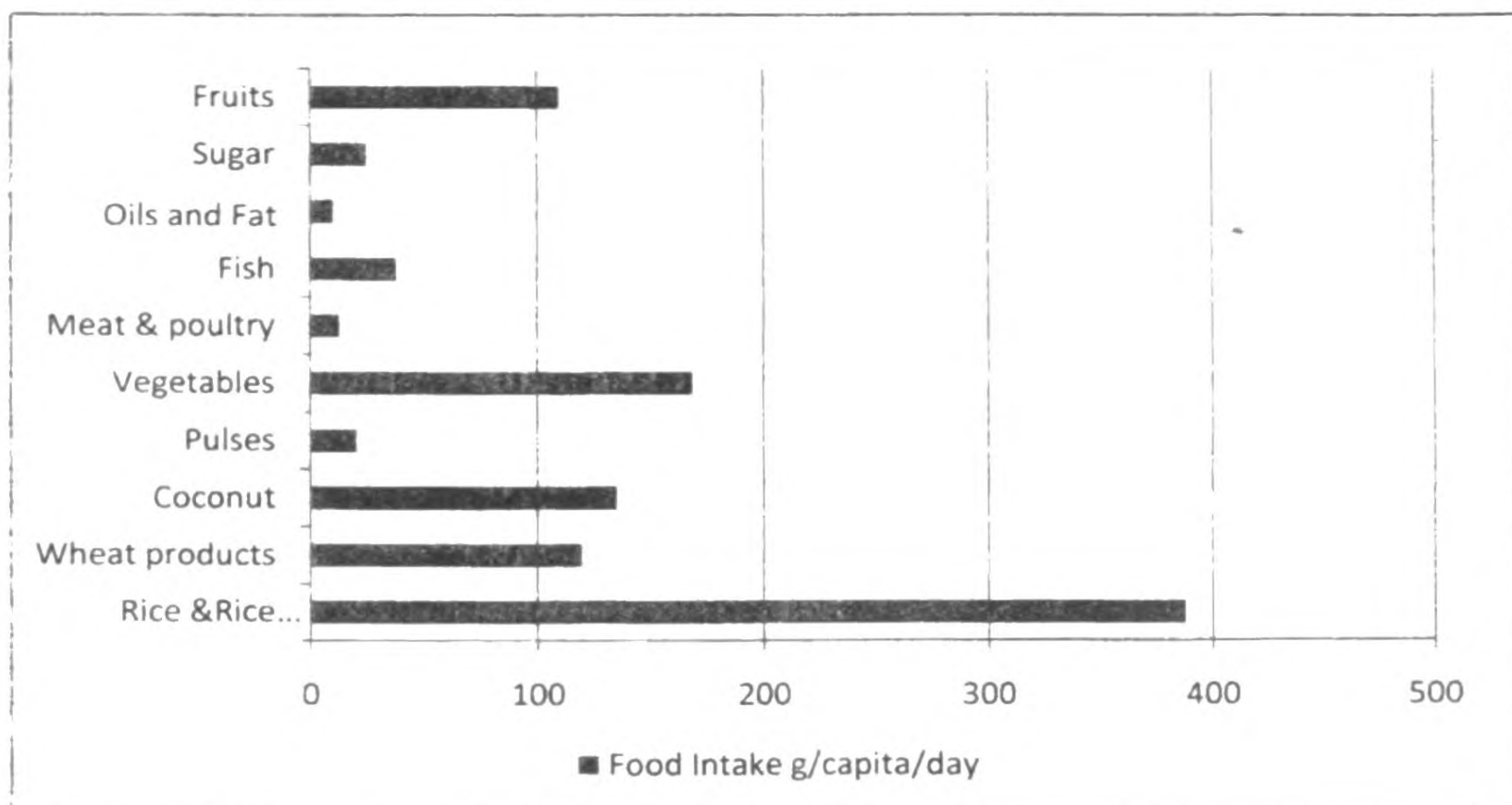
These statistics reveal that rice consumption in the village is satisfactory. Kelegama Grama Niladhari Division has main employment sectors in paddy production and chena

cultivation under rain fed conditions and minor irrigation régimes. Other sector is involved mainly in the pottery industry. In addition to limited production of paddy, kurakkan, cowpea, green gram and maize are grown in chenas. Due to fragmentation of lands, everyone does not have land to cultivate. Cultivating chena crops is decreasing. In the near future, there is much possibility of diverting to wheat based foods because chena cultivation is fast diminishing.

3.2.3.4 Food Consumption Pattern and Food Intake

Kelegama people cultivate paddy using rain water. Per capita consumption of rice and rice based foods is a high and amounts to 387.7gms though they eat wheat and wheat based foods up to some extent. (119.5gm) Fruit consumption is low (109.8gm) when compared to consumption of vegetables (167.9gm). Meat and fish consumption is very low. (12.7gm and 37.5gm respectively). Pulses are not popular in their diet.

3.2.3.4 Food Consumption Pattern and Food Intake: Kelegama



Source: HARTI Survey data 2008/09

Figure 3.3.1 Food Consumption Pattern and Food Intake

3.2.3.5 Case Study – R.W.S.W.M.G. Bandaranayake - Kelegama

I was born in 1931 in Kelegama Galgamuwa in the Kurunegala district. In our childhood our families prepared a number of food items from crops such as rice, maize, kurakkan, green gram, cowpea, yams, as well as from milk and curd.

My mother cooked raw white rice, potatoes, maisoor dhal, some wild animal's meat and mallum (green leaves) for meals. I took a rice parcel to school for lunch and returned home around 4 o' clock from the school. I had tea at home. We prepared dinner with parboiled rice, wild animal's meat curry or inland fish curry, green gram or dhal curry and anguna leaves salad. We ate kurakkan based food two or three days per week. The pittu and rotti were prepared from the kurakkan flour. We had a kurakkan grinding stone and prepared kurakkan flour at home. Kurakkan pittu was eaten with meat curry or green gram or dhal gravy or inland fish gravy and anguna leaves salad and fried chilli and curd. We do chena farming and go to chena in the morning and work till 5 o' clock and return home. When we go to chena we took kurakkan rotti for lunch. We cultivated kurakkan, green gram and walli chilies together in the chena in Maha season. After three months the harvest of kurakkan, green gram and chilies could be plucked.

During 1970's we received flour, coconut oil, maisoor dhal, sparts and rice as dried rations. String hoppers, rotti, pittu were prepared from wheat flour. When our parents went to Galgamuwa town they brought bread and sugar buns for children. We always prepared green gram curry and green dhal curry instead of maisoor dhal. Cowpea came to our area in 1950. Cowpea was eaten as a curry and in the boiled form. Our parents cultivated maize as a chena crop as well as a homegarden crop. We ate boiled maize daily during the harvesting season. Part of the yield was dried and stored for the food security and use in the off season. The dried maize seeds were ground to prepare maize flour at home and prepare rotti, mixed with onion and kochchi chili. Besides, we prepared maize pittu. We ate maize pittu with meat curry or inland fish curry or green dhal curry.

Yams

We cultivated manioc and sweet potatoes in the homegarden. When required we uprooted a bush of manioc and sweet potatoes, sufficient for a meal. People do not prefer much manioc and sweet potatoes. The villagers go to the forest and dig yams in the months of November, December and January. They dig varieties of yams called Katuwala, Rajala, Gonala, Kahata Angala from the forest. We ate these forest yams several times specially for breakfast and lunch. Due to lack of time, this habit has now disappeared.

Black Gram

Black gram is known as "Undu" among Sinhala people. A portion of the harvest of the extent cultivated is marketed. A portion of domestic consumption is processed as flour and for curries. Curry is eaten with kurakkan pittu. Popular "undugal" was made as a sweet, and undu was fried as "unduvadei".

Dried Fish

Villagers bought dried fish (mainly koduwa, balaya and anguluwa) from the weekly fair in Galgamuwa when the hunted meat and inland dried fish were not available with the villagers. Dried fish was mostly preferred by them. Fried dried fish was eaten regularly and mostly preferred varieties were katta, thora, angugluwa, sparts, keermin and kumbalawa. They were purchased from the fair.

Rice Flour

Raw white rice was used to processed flour. Rotti, pittu, hoppers, string hoppers and rice flour based sweets are popular. Main sweets were athirasa. mun kewun, naran kewun, asmee and aggala. In social gatherings and agricultural activities these were served.

Rare fruits are available in the area. Huge trees of palu, weera, gal siyambala, siyambala (tamarind) madan could be seen in the forest. Their nutritious values are high. Wood apple, slime apple, mango, guava, jak were homegarden fruits that were available.

People had sufficient fruits as well as curd and milk. Most households reared a herd of buffaloes. Homemade curd was eaten with kurakkan rotti or rice. The surplus was marketed.

Liquor Consumption

Villagers sometimes drank alcoholic liquor bought from the Galgamuwa town. We served liquor to those assisted us in our agricultural activities on special occasions. But liquor consumption was not regular.

Green gram and Cowpea were eaten for main meals: breakfast or lunch. We ate boiled green gram or cowpea with coconut and katta sambol.

We cultivated vegetables such as ladies fingers, pumpkin, luffa, long beans, snakegourd, ash pumpkin, cucumber, brinjals, tomatoes and chilies in chenas. Those vegetables were eaten more than the vegetables like cabbage and beans bought from the market. We went to the weekly fair to buy the home needs, but not vegetables. Our parents and some villagers went hunting and supplied wild meat. Wild boar, meeminna, deer, hedgehog, and rabbit were the hunted animals.

We had white rice with wild meat such as boar, deer, meeminna and hedgehog. Inland fish like loola, korali, pethiya, kawaiya, hunga, magura and ankurra were caught from the village tanks by using the instrument 'KARAKA'. The above fresh fish and dried fish were eaten with rice and kurakkan based foods. Except inland fish, dried sea fish was eaten, in less quantities.

Drumstick trees are grown in most of the homegardens and can be harvested in about 5 months. Drumstick curry is prepared as a tasty food in most of the homes. Cut into small pieces and mixed with dried meat and then green chilies kochchi and other ingredients added and cooked as a curry using milk and coconut oil. Special dried meat is cooked using coconut oil while fresh meat is cooked as a curry in gravy.

We prepared salad, sambol or mallum using leaves collected from the surrounding. The leaves of anguna, mukunuwenna, kankun, gotukola, kara kola, Loolhu Hathu are used for that purpose. These salads or sambols are eaten with rice or kurakkan pittu. When we prepared rice or kurakkan pittu we always prepare those salad, sambol or mallum.

This depicts a significant food pattern like in the case study mentioned in Manewa. All these are in major producing areas which bring to mind the era of our ancient kings. These are going to vanish with the instant foods which are given huge publicity through the electronic and printed media. No steps have been taken to introduce or popularize our healthy/ancient food items which did not use chemicals.

3.2.4 Study Location 4: Wattegama

District: Monaragala

DS division: Siyambalanduwa

GN division: Wattegama

3.2.4.1 Socio Economic Setting

This location is in the Monaragala district. Rice and chena crops such as maize, green gram, Kurakkan and long beans are grown in *Maha* season. The farmers face a scarcity of water during the *yala* season and stored additional harvest to use in the *Yala* Season. Current population represents the 3rd generation of the settled people and all are Sinhalese Buddhists. Most families have 3-6 members and they consist 57% of the population. Almost all the population is literate (94.6) and 11% of them have passed the GCE O/L. The majority of the population are educated upto 6-10 grade.

Farming and employment in Armed Forces are the main livelihoods in the area and employed population consists of 48%. A small percentage works in the Government sector (6%) and private sector (4%), skilled job percentage is significantly low. Employed male population in this area is 55%, while it is 45% for female according to the sample survey. Most of the young females (14%) are involved in the garment industry. The economic setting of the area represents an average rural agricultural area in the country. The average annual income varies between Rs. 19,190- 962,810. Villagers spent 20% of the total income on food.

3.2.4.2 Source of Food Supply and Food Expenditure

Wattegama is a conventional village. Its rice consumption is high. It has its own production of paddy. In addition to rice, main additional foods are cowpea, green gram, maize and long beans and rice flour based foods. Maize and long beans seeds are stored for consumption in the off season. Hence, throughout the year most of the villagers depend mostly on those two crops. Around half of the income, they spent on food.

Table 3.7: Source of Food Supply

Source	Main food	Vegetable	Leafy vegetable	Cereals	Yams	Meat/fish/d.fish	Other
Home.G	10	46	86	21	61	2	69
Paddy.F	84	2	10	-	-	-	-
Marcket	28	70	18	74	68	100	63
Neighbours	2	4	-	2	5	-	-

Source: HARTI Survey data 2008/09

3.2.4.3 Food Habits

According to the sample, these villagers consume rice for the three meals of the day as a main food. This study data describes rice consumption percentage of three meals. Breakfast, lunch and dinner is 78%, 90%, and 84% respectively for the persons staying at home. Proportion is 89%, 100% and 86% for those engaging in jobs. Percentage of the engaged in studies 86%, 94%, and 85% consume other foods, green gram, long beans seed, cowpea, kurakkan flour foods, rice flour food, maize, bread, wheat flour foods and yams for dinner. Family members who leave home for studies and jobs have to get breakfast from outside sources.

Table 3.8: The General Food Habit Situation in Wattegama

Category (House holds)	Breakfast							Lunch			Dinner			
	Rice	Bread	Rice Fl.food	Wheat Fl.Food	Cereal	Yams	Multi Foods	Rice	Bread	Multi Foods	Rice	Rice Fl. food	Wheat Fl.Food	*Multi Foods
Staying at home	78	-	-	-	-	-	22	90	-	10	90	-	-	10
Engaging in jobs	89	-	-	-	-	-	11	100	-	-	90	-	-	10
Engaging in studies	86	03	-	-	-	-	11	94	-	06	90	-	-	10

*Multi Foods - Green gram, Cowpea, Kurakkan Flour Foods, Rice Flour Foods, Maize, Rice, Bread, Wheat Flour Foods & Yams.

Source: HARTI Survey data 2008/09

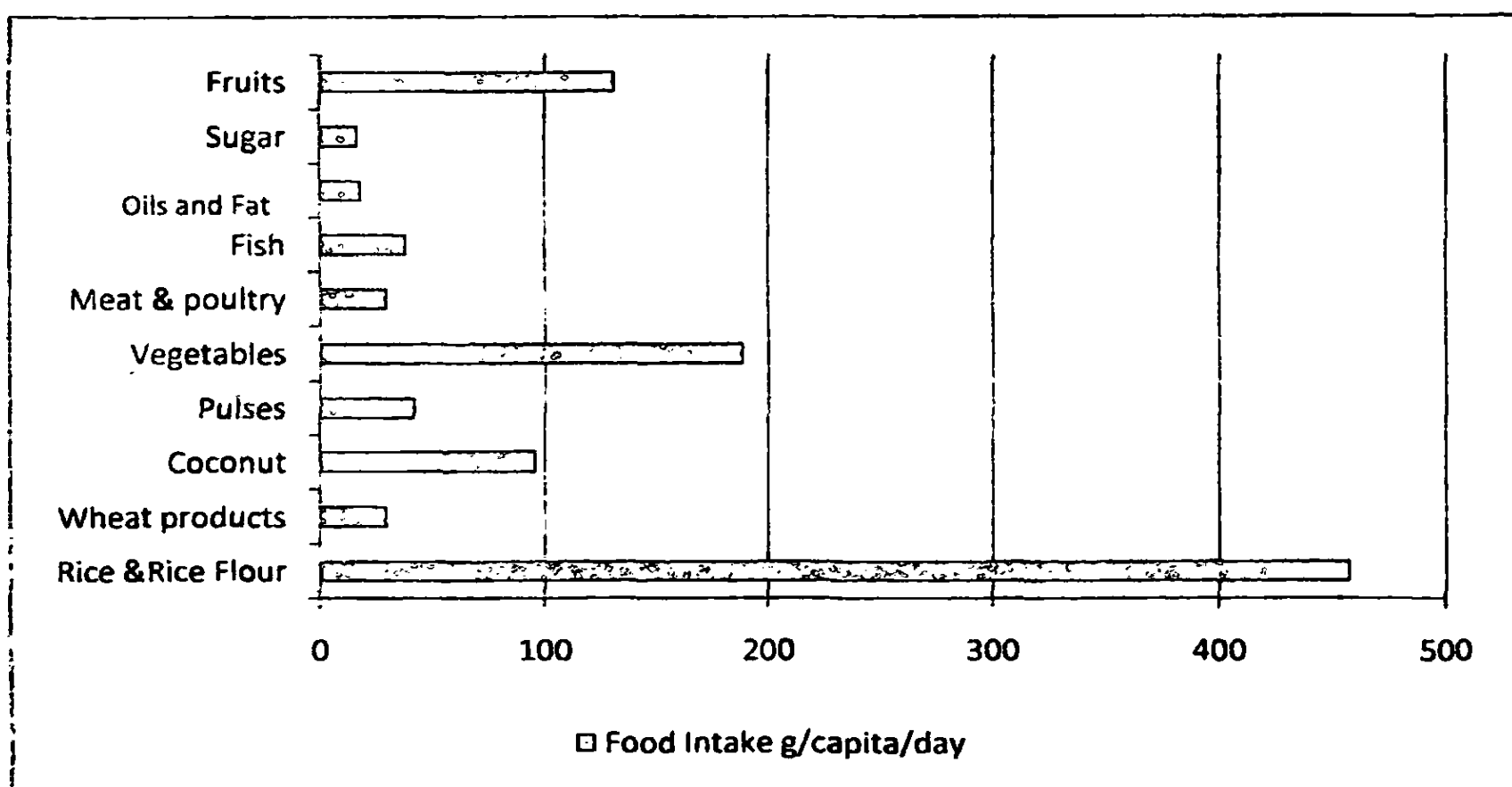
Rice and chena crops such as maize, green gram, kurakkan and long beans are grown in the *Maha* season. The villagers face scarcity of water during the *Yala* season thus, store additional harvest for the *Yala* season.

According to the survey information, 78% of those staying at home eat rice for breakfast, 84 percent for lunch, while 76 percent for dinner during weekdays. During the harvesting season of chena crops, food items such as maize, long beans, kurakkan and manioc are eaten for main meals. Long beans mixed with maize is very popular in this area. The rest of the above percentages eat different foods such as wheat flour and rice flour foods, kurakkan, long beans, maize, green gram and manioc.

This information reveals that the household members in this producing area mostly eat rice for the three main meals.

In addition to rice, additional main foods are cowpea, green gram, maize and long beans and rice flour based foods, as all those foods are available in many households. Maize and long beans seeds are stored for consumption in the off season. Hence, throughout the year most of them consume products made with those two crops.

3.2.4.4 Food Consumption Pattern and Food Intake



Source: HARTI Survey data 2008/09

Figure 3.4.1: Food Consumption Pattern and Food Intake: Wattegama

In the Wattegama study area, priority is given to chena cultivation. Hence all the pulses and legumes are sufficiently found in the households. Among all the study locations per capita consumption of rice and rice based foods are the highest (457.8gms), while the consumption of pulses also seems to be high (42.4gms). Fruit consumption specially mango, guava are high in this area. Currently rare fruits like mora, kone, maadan and cashew fruit are also available in this area and people consume those fruits. "Mee" trees are protected in this area because they process mee oil for domestic consumption and for sale. Commercial maize cultivation is also very popular. As they have their own maize stocks, they have been accustomed to eating boiled maize mixed with the seeds of long beans for breakfast. Visitors are also served with foods.

3.2.4.5 Case Study - Mr. R.M. Podi Mahattaya – Udikkapuaru, Vila Oya, Wattegama, Monaragala

I was born in 1957 in Kotiyagala. People called Muppanewatte for Monaragala in the beginning. There were no wet paddy fields in ancient days. Hence paddy was cultivated in highland. Cultivated varieties were: Kuru vee, H4, Gona baru, only for *maha* season under rainfed conditions.

Age of these varieties is 4 - 4 ½. Average yield (3*45) Bu/Ac.

Crops under chena cultivation were *Long beans, booma, Idal Iringu, Thiringu with red corn, kollu*, kurakkan and maize. Chena was also cultivated in the maha season.

No cultivation activities take place in *yala* season due to scarcity of water. The surplus of harvest was stored in (traditional store) *atuwa* for the domestic consumption. During these days all the family members were engaged in hunting and collecting wasps honey. These are only for domestic consumption. Coconut is not used for cooking purposes. Hence pittu and thalapa were eaten with a fried piece of meat and one of leafy vegetables. Bim kohomba and wahanella were used as indigenous medicine.

Rice was processed at home itself. Long beans, booma, cowpea, green gram and meat are the curries for lunch and dinner. No dried fish was purchased. No water reservoirs were seen in the area those days. Fish was reared in water pockets which were filled with water in the rainy season. They ate meat in large quantities. These consumption patterns were common before 1957. When hunting for meat, there were more specific vocabulary associated with hunting, *Katuwak anuna, parallak gahuna* were used. Deer was known as *karakolaya* and buffalo was *Ambaruwa*. We walked to the forest for hunting. Instead of tea we drank boiled traditional medicinal plants like *kothala himbutu, savandara, rasakinda* and *bim kohomba*.

Home-ground maize flour was used for making pittu. When the above mentioned traditional paddy varieties were ground there emerged broken rice. This portion was used to cook hunusal bath. Long beans, maize and green gram were boiled for main meals in sufficient quantities for all the family members most of the days to eat with meat of wild animals.

During our father's era kollu was cultivated sufficiently. It takes 4 - 4 ½ months for harvesting. Kollu seeds are soaked in water before making milk rice of kollu. Thalapa and halapa were made of kollu flour. Those items are very tasty. When preserving the seeds of kollu, cowpea and green gram, we put them in a labu kataya covered with ash, kohomba leaves and then close the mouth of the vessel. We kept some portion in the vessel for the sake of our grandparents. That was a custom which most of our parents followed.

Upcountry vegetables were bought from the fair when we wanted. During 1960 wheat flour was cheaply available in the area. Hence people were gradually compelled to eat it. Preparing was easy. Due to these reasons people were compelled to eat bread and wheat flour based foods for their meals. The price of 10 lbs. of wheat flour was Rs.2.20. Later it became the main food.

Late Mr. Senanayake founded Kotiyagala colony in 1960. My father came to the colony and added some encroached blocks to his property. In the beginning he cultivated both chena and paddy but later he was fully occupied with paddy. We had no calendars and did not have birth certificates to remember one's age. Instead, we kept those in our memory and counted the age according to it.

This is a main location for engaging in chena cultivation. The people in this area have a separate store with a capacity of 20 x 20 square feet. The main crops in the stores are maize, cowpea, black gram and kurakkan. These were obtained from their own chenas. They spent a happy, healthy life with their home-made foods.

3.2.5 Study Location 5: Malabe

District: Colombo

DS division: Kaduwela

GN division: Malabe North

3.2.5.1 Socio Economic Setting

Malabe is a semi-urban area in the Western Province. The native families and recently immigrated settlers both live in this area. They belong to different social strata and therefore food habits do not show a uniform pattern. According to the survey sample, all are Sinhalese and 94% Buddhists, 6% Christian. Most of the families have 3-6

members and they consist 75% of the population. Almost all the population is literate (100) and 27% of them have passed the GCE O/L while majority of the population are educated upto 6-10 grade and GCE O/L.

The main sources of revenue are in government sector (26%), private sector (31%), in skilled jobs (14% only male) and in self-employment (9% only female). Employees consist 81% of the employed population. Those who do farming related work (6%) are significantly low. Employed male population in this area is 65%, while it is 35% for female according to the sample survey. The economic setting of the area represents a semi-urban area in the country. The annual income of a household is between Rs.72,000- 1,840,000 where the average income is Rs.579,767.

3.2.5.2 Source of Food Supply and Food Expenditure

Malabe is a semi-urban area and people's rice consumption is 75%. They do not have their own production of paddy. The rest eat bread, wheat flour based rotti, string hoppers, and rice flour based string hoppers and pittu. Kurakkan based foods are not popular. Daily requirement of fish, meat, dry fish and other grains they obtain from the market. People spend 28% on their food, out of the total income.

Table 3.9: Source of Food Supply-Malabe

Source	Main food	Vegetable	Leafy vegetable	Cereals	Yams	Meat/fish/d.fish	Other
Home.G	-	30	62	-	26	-	50
Paddy.F	03	-	-	-	-	-	-
Market	93	93	52	100	79	100	40
Neighbours	-	-	-	-	-	1	10

Source: HARTI Survey data 2008/09

3.2.5.3 Food Habits

According to the sample, dwellers in this area mainly consume rice (75%) for all the three meals of the day as a main food. This study data describe rice consumption percentage of three meals. Breakfast, lunch and dinner is 57%, 100%, and 73% respectively for the persons staying at home. It is 72%, 96% and 73% for those employed. 31%, 93%, and 73% of those engaged in studies consume rice for breakfast. Other food consumed for breakfast and dinner are bread, wheat flour based rotti, string hoppers. Rice flour based string hoppers and pittu consumption is generally high. Family members who leave home for studies and employment have to get breakfast from outside sources.

Out of all 57 percent of members staying at home eat rice for breakfast during weekdays. Some 43% of the households in that category eat various foods such as rice flour based foods, noodles, pizza, green gram and gram. However, eating bread and wheat flour based foods are low and is about 3 percent. Rice is consumed by all the household members for lunch. Seventy three percent of these three categories eat rice for dinner and 20% of the householders eat other foods such as wheat flour foods, noodles, bread, green gram and gram. Three percent of the households eat rice flour based foods such as string hoppers, pittu and rotti. Wheat flour based foods are eaten by 3 percent.

Table 3.10: The General Food Habit Situation in Malabe

Category (House holds)	Breakfast							Lunch			Dinner			
	Rice	Bread	Rice Fl. food	Wheat Fl.Food	Cereal	Yams	Multi Foods	Rice	Bread	Multi Foods	Rice	Rice Fl. food	Wheat Fl.Food	*Multi Foods
Staying at home	57	03	-	-	-	-	40	100	-	-	73	03	03	21
Engaging in jobs	72	04	-	04	-	-	20	96	-	04	73	-	03	24
Engaging in studies	31	06	-	44	-	-	19	93	-	07	73	04	03	20

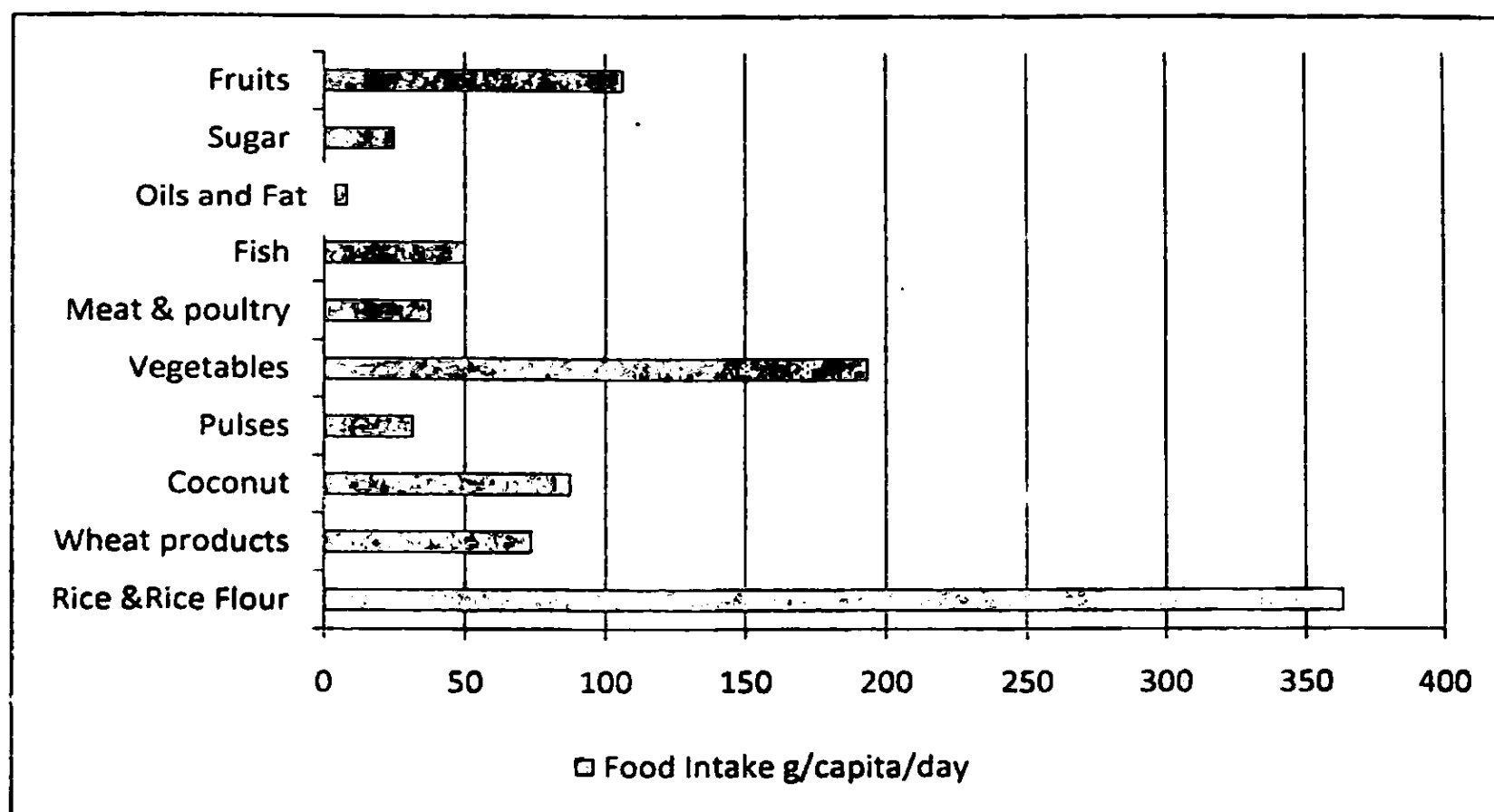
*Multi Foods - Green gram, Cowpea, Kurakkan Flour Foods, Rice Flour Foods, Maize, Rice, Bread, Wheat Flour Foods & Yams.

Source: HARTI Survey data 2008/09

Compared to the total main meals in a week, 83% of the meals are rice based foods. The rest is bread, wheat flour based rotti, string hoppers, rice flour based, rotti, string hoppers and pittu. Kurakkan based foods are not popular yet. Noodles (wheat flour based), cowpea and green gram are eaten by a few numbers of people. In addition those, vade and snacks are also taken with some meals.

Health considerations, easy preparation with day-to-day work and social status are the main reasons to practise these food habits.

3.2.5.4 Food Consumption Pattern and Food Intake : Malabe



Source: HARTI Survey data 2008/09

Figure 3.5.1: Food Consumption Pattern and Food Intake

Currently this area has a rapidly increasing population as it is very close to Colombo. Migrating percentage seems to be increasing. Due to establishment of the private universities, the number of fake-away outlets in the food sector is also increasing to cater to the younger generation in academic institutes. This has become a major income source for the people in this area. Hence instead of increasing the consumption of rice and rice based foods, an increase of wheat and wheat based food could be expected. Current per capita consumption of rice and rice based foods is 363.6gm, while the wheat and wheat based consumption is depicted as 73.8gm. The consumption of pulses is 32-1gms and this can also increase in this area. Fish availability in this area is high as many traders supply fish.

3.2.5.5: Case Study - Mr. K.A. Sumanasiri, Malabe North

I have five members in my family, including son-in-law and the grand daughter. I got married and came here, to the wife's place. I am working in the Ministry of Agriculture. Son in-law is working in the Board of Cricket.

We ate so many rice varieties at the beginning of our marriage. Samba, BG305, Batagolla, Pokuru Samba were some of them cultivated in our own paddy fields in Malabe.

Pumpkin, Kohila yams and leaves, jak, breadfruit and tuber roots , innala, hingurala, sweet potatoes, manioc, keerala were obtained from our homegardens. We got fish from the closeby water stream and eggs were also available. Our village was not urbanized during these days. Hence so many fruit trees were there in our large homegarden. Coconut brought an extra income.

This self-sufficient homegarden was very supportive to us. We bought only soap and salt from the shop. We sold some land blocks in 2005. At present Banana, Veralu, Papaw, Guava, Mango and Lemon fruits are available.

But since lately, unfortunately our food pattern is changing. Instead of cultivating, the culture is changing to get food from take-aways.

3.2.6 Study Location 6: Hunupitiya

District: Colombo

DS division: Colombo

GN division: Hunupitiya

3.2.6.1 Socio Economic Setting

Vauxhall Street in Hunupitiya GN Division in Colombo AGA Division has a high density of population. Sinhala (38%), Tamil (22%), Muslim (40%) communities are mixed in this study location and therefore the food habit does not show a uniform pattern. 35% Buddhists, 17% Christian, 22% Tamil, 08% Hindu and 40% follow Islam. Most families have 3-6 members and they consist 73% of the population. Almost all the population is literate (93.1) and 7% of them have passed the GCE O/L while majority of the population are educated upto 6-10 grade and 1-5 grade.

The main sources of revenue are from non agricultural labour (30%), private sector (30%), skilled jobs (6% only male) and self-employment (16%). The employed population consists of 82%. Farming related work is zero because there is no space for cultivation.

Armed Forces (6%) percentage is significantly low. Employed male population in this area is 70%, while it is 30% for female according to the sample survey.

The economic setting of the area represents an urban area in the country. The average annual income of households is Rs.216,602. Minimum annual income in the area is Rs. 51,000 and maximum is Rs.528,000. Nearly 60% of the income is spent on foods, as residents do not have adequate land for producing food. According to the income, about 35% of the population remains below the national poverty line.

3.2.6.2 Source of Food Supply and Food Expenditure

Vauxhall is an urban area. Out of the total expenditure, 73%, is spent on food. Compared to the total income, the expenditure for food is 57%. Residents have to buy all food needs from the markets as they have limited land. Due to urban settlement, they have to depend on the market. People living in this environment consume purchased prepared foods for breakfast. Especially they buy bread, buns, laveriya and wheat flour based foods from mobile carts. Daily requirement of fish, meat, dry fish and grains they purchase from the market.

Table 3.11: Source of Food Supply (Hunupitiya)

Source	Main food	Vegetable	Leafy vegetable	Cereals	Yams	Meat/fish/d.fish	Other
Market	100	100	100	100	100	100	100

Source: HARTI Survey data 2008/09

3.2.6.3 Food Habits

According to the sample survey, dwellers consume different food items for the three meals of the day. Therefore, there is no uniform pattern. This study data shows rice consumption percentage for breakfast, lunch and dinner are 3%, 89%, and 76% respectively for the household staying persons. The amount is 01%, 88% and 76% for those engaging in jobs. Those engaged in studies 01%, 90%, and 70% consume rice for breakfast. Other food for breakfast and dinner are bread, wheat flour based rotti, string hoppers, kotturotti, parata, idly, buns and sandwiches. Rice flour based string hoppers and pittu consumption is generally high. Family members who leave home for studies and jobs have to get breakfast from outside.

Table 3.12: The General Food Habit Situation in Hunupitiya

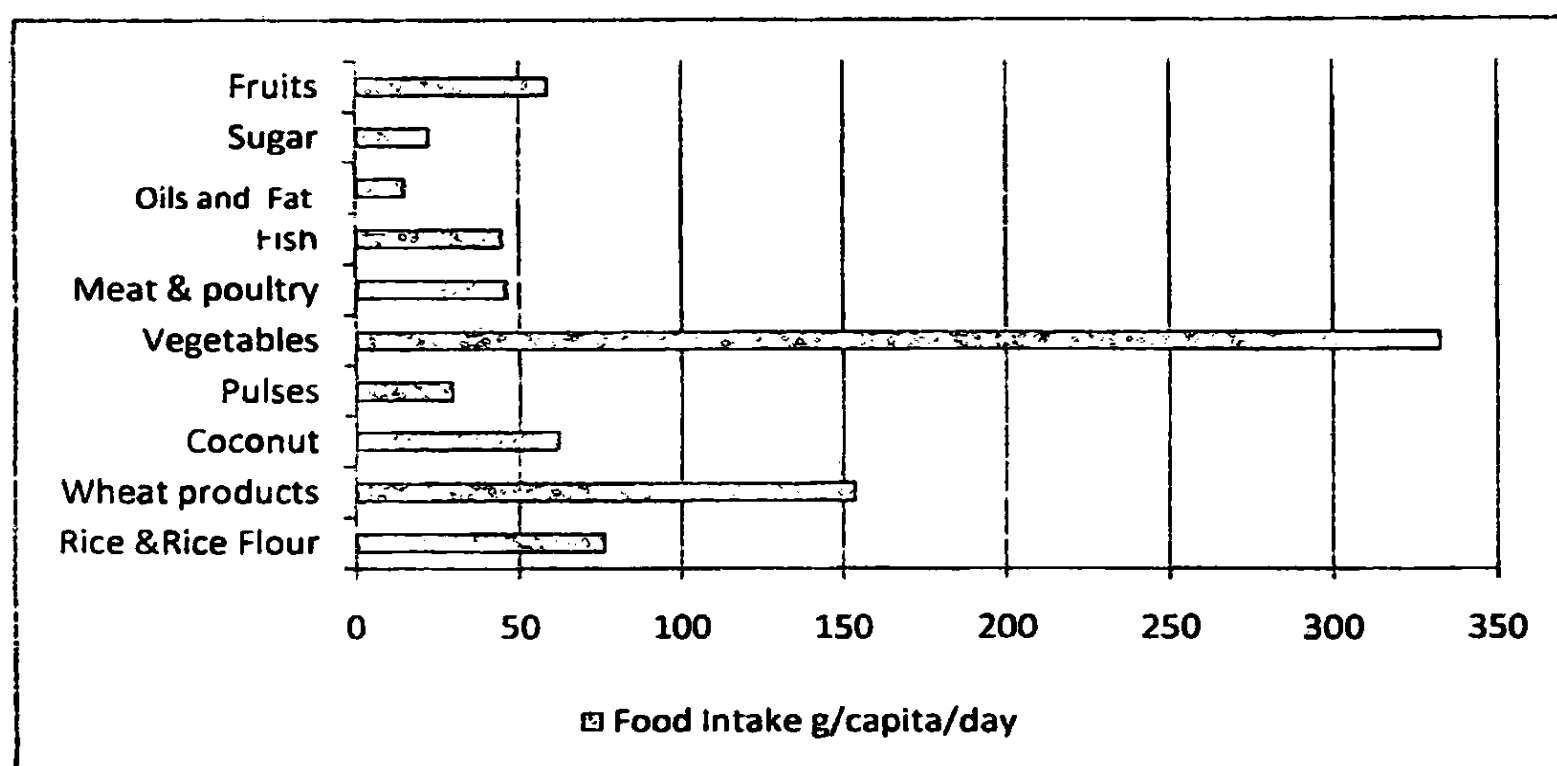
Category (House holds)	Breakfast							Lunch			Dinner			
	Rice	Bread	Rice Fl.food	Wheat Fl.Food	Cereal	Yams	Multi Foods	Rice	Bread	Multi Foods	Rice	Rice Fl. food	Wheat Fl.Food	*Multi Foods
Staying at home	03	38	-	-	-	-	59	89	03	08	76	03	03	18
Engaging in jobs	01	35	-	03	-	-	6	88	04	08	76	03	03	18
Engaging in studies	01	28	-	07	-	-	64	90	-	10	70	02	0	25

*Multi Foods - Green gram, Cowpea, Kurakkan Flour Foods, Rice Flour Foods, Maize, Rice, Bread, Wheat Flour Foods & Yams.

Source: HARTI Survey data 2008/09

The residents eat three main meals but there is no uniform pattern. The main meals included, in the survey period of seven days, rice and rice mixed meals eaten by 57% of the total meals.

3.2.6.4 Food Consumption Pattern and Food Intake



Source: HARTI Survey data 2008/09

Figure 3.6.1: Food Consumption Pattern and Food Intake : Hunupitiya

This location is mostly populated with people living in shanties. Hence they have limited facilities and limited residential space. Cooking is also limited. They are well supplied by instant food parlours because they are living in the Colombo Municipal area.

It is significant that the per capita consumption of rice and rice based foods is lower (76.6gm) than the consumption of wheat and wheat based foods (154gm). The per capita consumption of fish and meat is almost similar and it is around 45gm.

3.2.7 Study Location 7: Illawathura

District: Kandy

DS division: Udapalatha

GN division: Illawathura

3.2.7.1 Socio Economic Setting

Illawathura belongs to Udapalatha AGA Division which is bordering the Mahaweli River. It is fully populated with Sri Lankan Moors. Therefore, food habits in the area are uniform. According to survey sample all are Muslim and 100% profess Islam. Most of the families have 3-6 members and this consists 65% of the population. 33% have 7-9 family members. Almost the entire population is literate (99.3%) and 15% of them have passed the GCE O/L while majority of the population is educated up to 6-10 grade. The main sources of revenue are business (33%), private sector (11%), self-employment (17%, male 11%, and female 6%) and a considerable number is engaged in the Government sector and foreign employment (13%). It consists 87% of the employed population. Both farming related work (0%) and self-employment percentage is significantly low. The employed male population in this area is 82%, while it is 18% for females. The economic setting of Illawathura presents it as an urban area in the District. The average annual income of the area is Rs.260,867. The minimum and maximum annual income is Rs.72,000 and Rs.90,000 respectively. They spent one third of the income on food.

3.2.7.2 Source of Food Supply and Food Expenditure

Illawathura is an urban area and their rice consumption is very low. But, consumption of rice for lunch is higher than other two meals. They do not have their own production of paddy. The majority eat multiple foods like wheat flour based rotti, string hoppers, pittu, noodles, chapathi and idly. Daily requirement of fish, meat, dry fish and other grain are purchased from the market. Out of total income, they spent 36% on food annually and 63% on food out of the total expenditure.

Table 3.13: Source of Food Supply

Source	Main food	Vegetable	Leafy vegetable	Cereals	Yams	Meat/fish/d.fish	Other
Home G	-	3	10	-	4	-	-
Market	100	100	97	100	96	100	100

Source: HARTI Survey data 2008/09

3.2.7.3 Food Habits

According to the sample, dwellers in this area mainly consume rice only for lunch (98) as a main food. This study data describes rice consumption percentage of three meals. Breakfast, lunch and dinner is 03%, 100%, and 23% respectively for the persons staying at home. That is 17%, 100% and 23% for those engaged in jobs. For those engaged in studies the percentages are 05%, 95%, and 23%. Consumption of rice for breakfast by the above three categories is significantly low. Students eating wheat flour based foods for breakfast are at a higher rate around 70 percent, rice is 5 percent. The percentage of rice flour based foods and multi-foods consumption are similar. Rice consumption rate is 95 percent and multi food consumption for lunch is as low as 5 percent.

Other food for breakfast and dinner, such as bread, wheat flour based rotti, string hoppers, chapathi and idly consumption is generally high. Family members who leave home for studies and jobs have to get breakfast from outside. (Table 3.26)

Table 3.14: The General Food Habit Situation in Illawathura

Category (House holds)	Breakfast							Lunch			Dinner			
	Rice	Bread	Rice Fl.food	Wheat Fl.Food	Cereal	Yams	Multi Foods	Rice	Bread	Multi Foods	Rice	Rice Fl. food	Wheat Fl.Food	*Multi Foods
Staying at home	03	-	31	27	-	-	39	100	-	-	23	03	17	57
Engaging in jobs	17	07	-	60	-	-	16	100	-	-	23	03	17	57
Engaging in studies	05	-	14	66	-	-	15	95	-	05	23	03	17	57

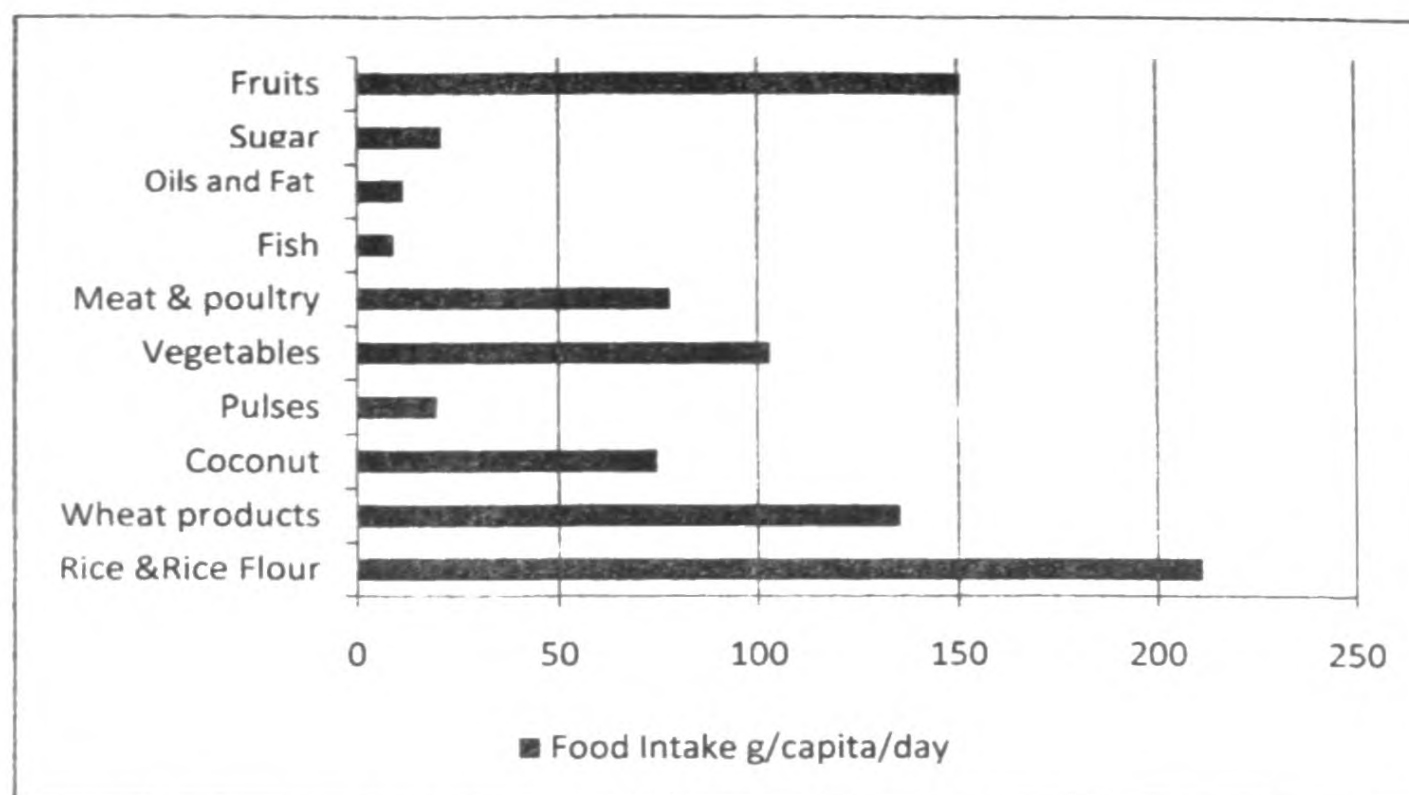
*Multi Foods - Green gram, Cowpea, Kurakkan Flour Foods, Rice Flour Foods, Maize, Rice, Bread, Wheat Flour Foods & Yams.

Source: HARTI Survey data 2008/09

The Moor community has been accustomed to eating rice for one meal in 7 days or 4 days minimum. This one meal is taken for lunch. Consumption pattern is very clear in the given consumption table. Considering the number of main meals in seven days for 52% of meals they have eaten rice and rice based foods.

The above data reveals the rice consumption pattern during a week. Rice consumption in three meals or two meals per day could hardly be found in this sample. Some 28% of sample households eat rice for one meal per seven days.

3.2.7.4 Food Consumption Pattern and Food intake - Illawathura



Source: HARTI Survey data 2008/09

Figure 3.7.1: Food Consumption Pattern and Food Intake

Muslims are the majority in this location. Per capita consumption of rice and rice based foods is at a moderate level of 211.4gm, and wheat based food consumption is also less than 150gm. But comparing with the national per capita consumption per day in Illawathura wheat based food consumption is above the national level. It is significant that fish consumption is negligible but the consumption of meat (78gm) is higher.

3.2.7.5 Case Study - Mrs. Abdul Lathiet Sithini Nisa – Illawatura – Gampola

My name is Abdul Lathiet Sithini Nisa and I was born in 1949 in Illawatura Village. In our childhood our family ate more rice and less wheat flour foods. At that time, our breakfast was as follows. Nadu rice or raw white and potato curry or gravy and coconut sambol, milk rice and lunumiris. Wheat flour, coconut and salt mixed rotti. Wheat flour string hoppers, maisoor dhal and coconut sambol and sugar. Our home members did not eat bread.

Our normal lunch is as follows. We eat rice with three curries. Nadu rice and beef curry and some vegetables of beans, leeks, beetroot, snakegourd, luffa, bittergourd, cucumber and baby jak ambul or mallum. We add one mallum from green leaves such as mukunuwenna, gotukola, japanese brinjal leaves, bittergourd mallum. We eat one sea fish curry such as salaya, hurulla, sprats or other small fish. We eat beef three or four days with rice.

In the jak season boiled jak is eaten with rice and coconut milk gravy. Our dinner consisted as follows. We did not have dinner fully like lunch. We had nadu rice and one vegetable and maisoor dhal curry. As bed tea we drank tea with cow's milk and had biscuit or buns. At about 10.00 o'clock we drink tea without milk.

In the afternoon between 3.30 to 4.00 o'clock we drink tea with cow's milk. We prepare dhal wade, patties, cutlet and vegetable mixed rotti for tea.

In 1974, our food pattern changed slightly. At that time Sri Lanka faced a food crisis. Therefore, our food pattern also changed and we added more wheat flour, bread, jak, jak fruit and yams.

For breakfast we ate boiled manioc, or breadfruit and coconut sambol, hoppers with coconut sambol or sugar, bread with maisoor dhal curry and coconut sambol. String hoppers, maisoor dhal gravy and coconut sambol. We ate rice for lunch and dinner.

In 1976, 1977 eating rice for two meals was reduced to one meal and it was eaten only for dinner.

Our food pattern was established in the following way in 1976. Wheat flour foods like string hoppers, pittu and rotti, for the breakfast. Rice and curry for lunch again and wheat flour foods like pittu, rotti, thosai for dinner.

At present we follow the following food schedule for the schoolchildren.

- Monday: Gram, cowpea or green gram
- Tuesday: Vegetable mixed wheat flour rotti
- Wednesday: Rice, green leaves mallum, sprats and a vegetable variety
- Thursday: Wheat flour string hoppers, with maisoor dhal or potato gravy
- Friday: Milk rice

On Saturdays and Sundays we prepare special foods for children for breakfast: Bread with dhal wade, potato gravy and coconut sambol. Or boiled manioc with coconut sambol, or boiled sweet potato with coconut sambol.

For lunch rice and curry is prepared for children.

For dinner we prepare rice or bread.

Wheat flour string hopper or rotti are prepared for children.

On Friday we prepare special foods for the whole family as follows.

With nadu rice and maisoor dhal, chicken, potato, brinjal curry. Except that as dessert we prepare pudding with custard powder, sugar and milk powder mixed. For breakfast we prepare noodles mixed with some vegetables and beef. After having dinner the remaining noodles we eat for breakfast on the following day.

We do not use rice flour when we prepare rotti, pittu and string hoppers.

This is a consuming area. They eat wheat flour based foods more than the people in producing areas. Foods have to be purchased from the market. They prefer to eat rice in small quantities. Kurakkan and maize based foods are not included but maisoor dhal vadei and string hoppers are eaten. Eating vegetables in this area is less.

3.2.8 Study Location 8: Ruwaneliya

District: Nuwaraeliya

DS division: Nuwaraeliya

GN division: Ruwaneliya

3.2.8.1 Socio Economic Setting

This study location is the old tea estate in Ruwaneliya. It belongs to Nuwaraeliya AGA Division. According to survey sample, all are Tamils and 70% Hindu and 22% Christians. Most of the families have 3-6 members consisting 81% of the population and 18% is having 7-9 members. Almost the entire population is literate (95.2%) and 8% of them have passed the GCE O/L while majority of the population is educated up to 6-10 grade (62%) and Grade 1-5 (33%).

The main sources of employment are as state workers (51%), agriculture related labourer (10%), farming (8%). It consists of 69 % of the employed population. In addition, self-employment (4%, male 1% and 3% female), both government and business are similar (3%), private and skilled jobs are also similar (4%). Employed male population in this area is 57%, while it is 43% for employed females.

The economic setting of the area represents the estate sector in the country. The average annual income in Ruwaneliya is Rs. 192, 279. The minimum annual average income is Rs. 12, 000 and maximum is Rs. 630, 000. Their expenditure on foods is 53% from their income. The ratio between rich and poor income group is more than one. According to the income, about 50% of the population remains below the national poverty line.

3.2.8.2 Source of Food Supply and Food Expenditure

Ruwaneliya is an estate area and rice consumption of the inhabitants is very low. However, consumption of rice for lunch and dinner is higher than for breakfast. They do not have their own production of paddy. The majority eats multiple foods specially wheat flour based rotti (estate management supplies wheat flour at subsidized price and they believe wheat flour rotti provides enough strength to work in estate). They also eat vadei, noodles, chapathi, idly. Supply of 39% vegetable and 9% leafy vegetables are from their own homegarden. For daily requirement of fish, meat, dry fish and other

items they depend on the market. Out of the total income, they spend 53% on food annually and 74% of the total expenditure is on food.

Table 3.15: Source of Food Supply

Source	Main food	Vegetable	Leafy vegetable	Cereals	Yams	Meat/fish/d.fish	Other
Homegarden	-	39	9	-	26	-	-
Market	100	92	96	100	83	100	100
Neighbours	-	27	7	-	10	-	-
Workplace	-	63	-	-	-	-	-

Source: HARTI Survey data, 2008/09

3.2.8.3 Food Habits

According to the sample, dwellers in this area mainly consume rice for lunch and dinner as a main food. This study data shows rice consumption percentage of three meals. Breakfast, lunch and dinner is 08%, 88%, and 85% respectively for the persons staying at home. That is 0%, 89% and 88% for those engaged in jobs. For those engaged in studies are 07%, 73%, and 89%. Consumption of rice for breakfast under above three categories is significantly low. Other food for breakfast and dinner, specially wheat flour based rotti, green gram, thosei, vadei, chapathi and noodles consumption is generally high. Family members who leave home for studies and jobs get their breakfast from outside. (Table 3.16)

Table 3.16: The General Food Habit Situation in Ruwaneliya

Category (House holds)	Breakfast							Lunch			Dinner				
	Rice	Bread	Rice Fl.food	Wheat Fl.Food	Cereal	Yams	Multi Foods	Rice	Bread	Multi Foods	Rice	Bread	Rice Fl. food	Wheat Fl.Food	*Multi Foods
Staying at home	08	-	-	60	-	-	32	88	-	12	88	-	-	-	15
Engaging in jobs	-	-	-	80	-	-	20	80	10	10	85	-	-	-	15
Engaging in studies	07	-	-	67	-	-	26	73	-	27	85	-	-	-	15

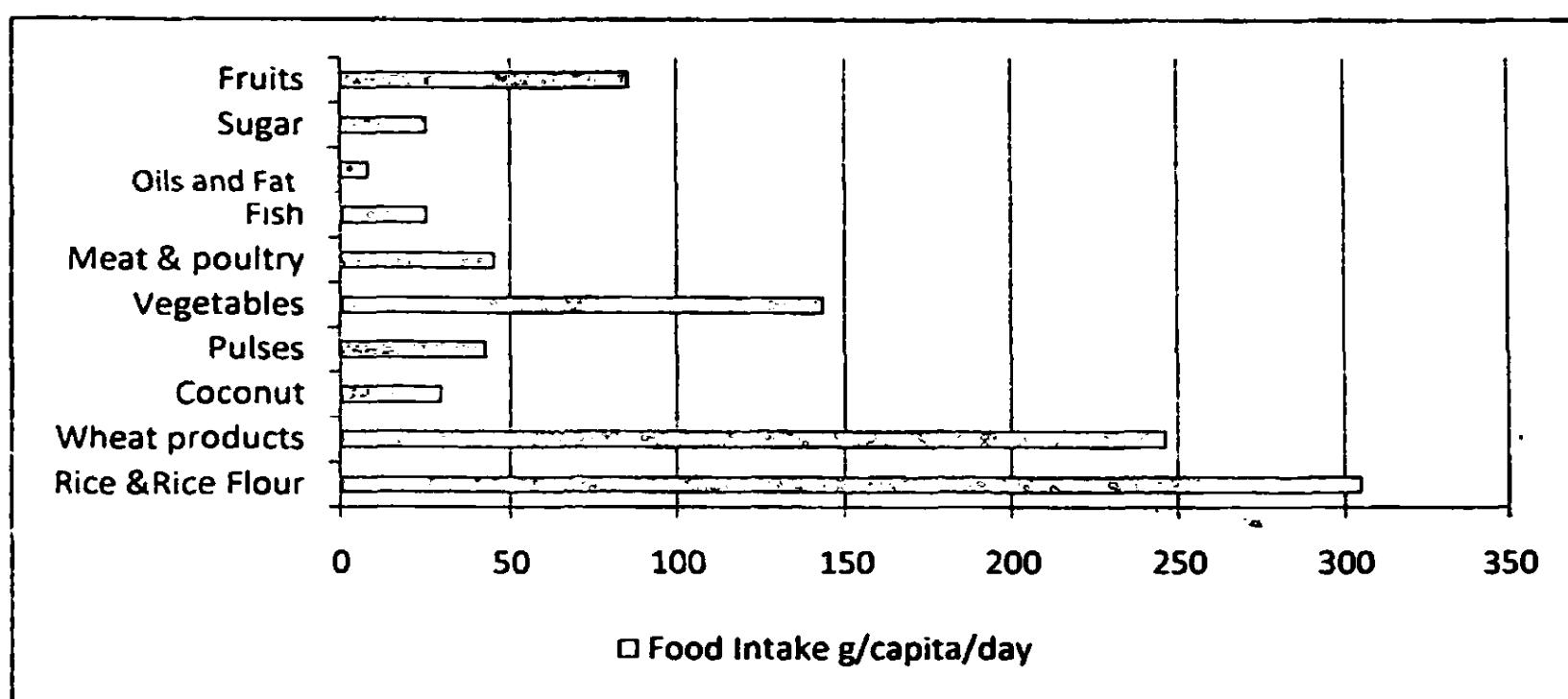
*Multi Foods - Green gram, Cowpea, Kurakkan Flour Foods, Rice Flour Foods, Maize, Rice, Bread, Wheat Flour Foods & Yams.

Source: HARTI Survey data 2008/09

The above consumption pattern shows that the traditional pattern has changed. Their traditional pattern of eating mainly wheat flour rotti seems to be deteriorating. Although they believe wheat flour rotti generates more strength for their day-to-day work, currently with the increasing price of wheat they have started to eat more rice. The above table reveals that rice was eaten 65% in main meals.

The above data reveals the rice consumption pattern during a week. Some 90% of the sample households eat rice for two meals in seven days. Ten percent eat rice for two meals per day in four days.

3.2.8.4 Food Consumption Pattern and Food Intake



Source: HARTI Survey data 2008/09

Figure 3.8.1: Food Consumption Pattern and Food Intake : Ruwan Eliya

Ruwaneliya is a residential area of the tea pluckers of Pedro estate in Nuwara Eliya. Usually their diet is mainly based on wheat and wheat based foods. Most of the residents have understood that the consumption of wheat flour based foods is unfavourable for health. Hence, the gap between per capita consumption of rice and rice based foods (305.1gms) and wheat and wheat based foods (246.7gms) is decreasing.

Per capita consumption of fruits (85.9gm) is at a low level compared to the national figure (109.53gm). Hence awareness is needed in this area.

3.2.8.5 Case Study - Mrs. Pottu - Pedro Tea Estate (Lower division), Ruwan Eliya, Nuwara Eliya

I was born on 11.12.1940, married at the age of 21. Before marriage lived in Hatton. Husband worked in this tea estate. Now he is 83 years old. His name is Muttusami. Earlier, there was a branch of the factory in this division. He collected green leaves there. I have two sons and two daughters.

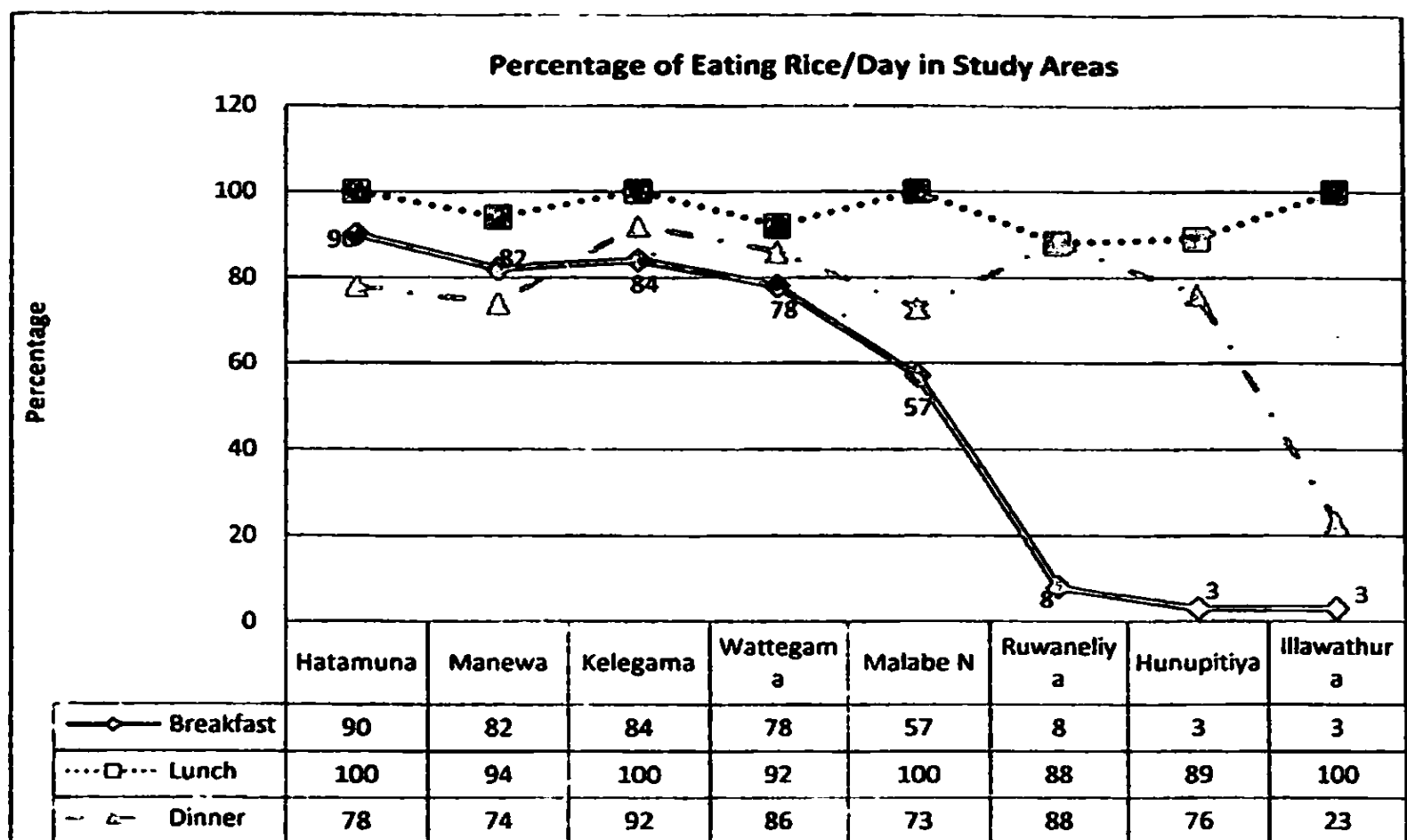
Manioc, potatoes bread and maldive fish were issued by the estate management. The estate cooperative had enough maisoor dhal and gram. Orange, apple, guava and so many fruits were also available at low prices. A 50 lbs of wheat flour bag was bought for a month. The surplus of food cooked in our home was given to the neighbours. With two or three curries we ate a very high standard meal. Rice flour mixed with black gram flour were mixed and hoppers were consumed with a curry of dried fish and maldive fish. Potatoes were eaten at a higher quantity as we had enough potatoes at a very low price. Upcountry vegetables were also cheap. We exchanged those with vendors. Biscuits were bought from the small shops when needed. Green leaves were cooked regularly for lunch and dinner like *kemberiya*, *mukunuwenna* and leafy cabbage. When making rotti, we used 02 pounds of wheat flour. Four rotties were made for both of us. My husband could eat two loaves of bread for a meal when he was young. Now those eating habits have changed with the current financial problems.

The traditional main food of this people is wheat based rotti due to convenience in making and the availability of wheat flour. Although they are close to producing areas of upcountry vegetables, their meals are not rich in vegetables. However potatoes are eaten regularly. They prefer leafy vegetables.

3.2.8.6 Summary of Consumption of Rice in all the Study Locations

The study observed the behaviour of food pattern in two ways; general and through seven day-diet diary. Through 7 day diet- dairy the consumption pattern of main meals during a particular week was examined, taking the whole family as a unit. This study considered 10 households in all the locations.

Considering the overall locations, a high percentage of people staying at home consume rice. In Hatamuna, Kelegama, Illawathura and Malabe North they consume only rice for lunch. Manewa and Wattedgama are almost similar in consuming rice by nearly 90% percent followed by Ruwaneliya and Hunupitiya by around 88 percent.



Source: HARTI Survey data 2008/09

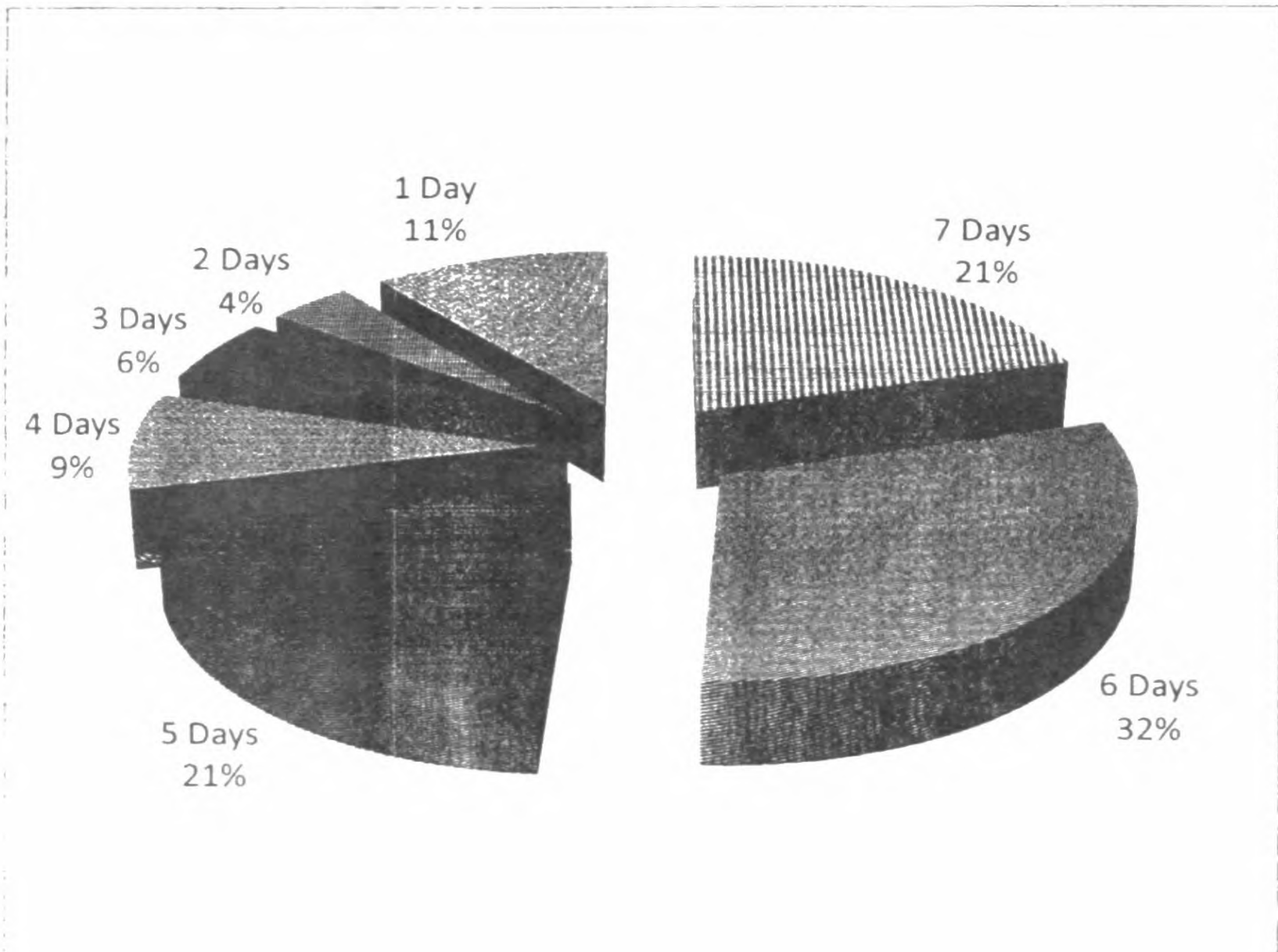
Figure 3.8.2: General Food Habits in all the Study Locations

Hatamuna, Kelegama, Manewa and Wattegama are producing areas. Hence they have enough food for their own consumption while Ruwaneliya is a location situated in a tea estate. Ruwaneliya people currently have reduced their wheat flour consumption to a significant level. Although they are getting wheat flour at a subsidized price, due to health reasons they are moving from wheat flour rotti to rice. Malabe; is a semi-urban area in Colombo and has an increasing trend of migrated population from upcountry and southern areas. According to key informant interviews held during the survey period, traditionally this area had paddy fields and a majority of the people owned them. Some of them who are still alive are producing their own rice for consumption. The other area, Illawathura, the majority are Muslims and they prefer rice for lunch.

When considering the breakfast it is significant that all the producing areas in the study areas like Hatamuna, Manewa, Kelegama and Wattegama consume rice for breakfast. In Malabe, consumption of rice is nearly 57 percent. Some people are accustomed to eat wheat based foods such as string hoppers and hoppers bought from take-away outlets as the number of newly opened take-aways are increasing with the rising population in the area. It can be highlighted that in consuming areas such as Ruwaneliya, Hunupitiya and Illawathura, the consumption of rice is significantly low which is nearly 5 percent.

Rice consumption for dinner is the highest in Kelegama (92 percent) followed by Ruwaneliya, Wattegama in similar percentages (nearly 85) and Hatamuna, Manewa and Malabe North it is around 75 percent. The lowest percentage of rice consumption was observed in Illawathura as the Muslim community living in the area likes light diets of wheat based foods.

3.2.8.7 The Pattern of Eating Rice for Three Meals/ Day



Source: HARTI Survey data 2008/09

Figure 3.8.3: Percentages of Households According to Selected Locations Having Three Meals per Day

Table 3.17: The Pattern of Eating Rice for Main Meals in the 7 day-diet diary – Overall Review

No. of Days	Eating		Rice/Day	
	Three meals		Two meals	
	No	%	No	%
7	10	21	12	23
6	15	32	03	06
5	10	21	03	06
4	04	09	07	13
3	03	06	07	13
2	02	04	10	19
1	05	11	11	21
Total No. of HHs	47	100	53	100

Source: HARTI Survey data 2008/09

The whole sample, reveals that eating rice for 3 meals 06 days is the highest (32%) followed by eating rice for 3 meals 07 days and 05 days, showing a similar percentage of 21. Eating rice for the three main meals per day in 4,3,2, and 1 day is nearly 10 percent.

Next step of eating rice for 2 meals in 7 days is the highest (23%) followed by eating rice for 2 meals in a day (21%) and in two days (19%). Eating rice for 2 meals in four days and 3 days are similar (13 percent) while eating rice for 2 meals in 06 days and 05 days is depicted a similar percentage of 06.

Table 3.18: The Percentage of Eating Rice for Three Meals/day in Separate Locations

Location	Percentage of HHs Eating Rice						
	07 days	06 days	05 days	04 days	03 days	02 days	01 day
Hatamuna	30	27	30	50	-	-	-
Manewa	20	27	10	-	33	-	-
Kelegama	40	13	10	-	-	-	-
Malabe N	10	07	10	-	33	50	-
Wattegama	-	27	40	25	33	-	-
Illawathura	-	-	-	-	-	-	33
Hunupitiya	-	-	-	25	-	50	67
Ruwaneliya	-	-	-	-	-	-	-

Source: HARTI Survey data 2008/09

Eating rice for three meals/day in separate locations is as the above Table.

Eating rice for 3 meals in seven days is the highest in Kelegama and Hatamuna, which are producing areas. Manewa and Malabe are depicting a low percentage of 20 and 10 percents respectively.

The next highest percentage of rice consuming households for three meals in 6 days was reported from Hatamuna, Manewa and Wattegama in a similar percentage of 27. Malabe is a semi-urban area and it has the lowest percentage of 7. As explained in the general food consumption behavior, the mixture of migrated people mostly buy foods other than rice from Take-aways. The highest percentage of eating rice for three meals for 5 days could be observed in Wattegama by 40 percent, followed by Hatamuna (30%).

In Manewa, Kelegama and Malabe the percentage of consuming rice for three meals in 5 days is similar (10 percent). The people in Manewa, Wattegama and Hunupitiya locations eat rice for 3 meals in four days. First two locations are engaged in Chena cultivation and they have enough pulses and yams as extra food. Hence they eat those foods as alternatives. Hunupitiya location does not have enough land to cultivate but they buy food from take-aways which have become popular there.

People at Manewa, Wattegama and Malabe locations were accustomed to eating rice for 3 meals in three days in a similar percentage of 33 percent. They eat wheat flour foods mostly instead of rice. They prefer wheat flour based foods for a change as an alternative.

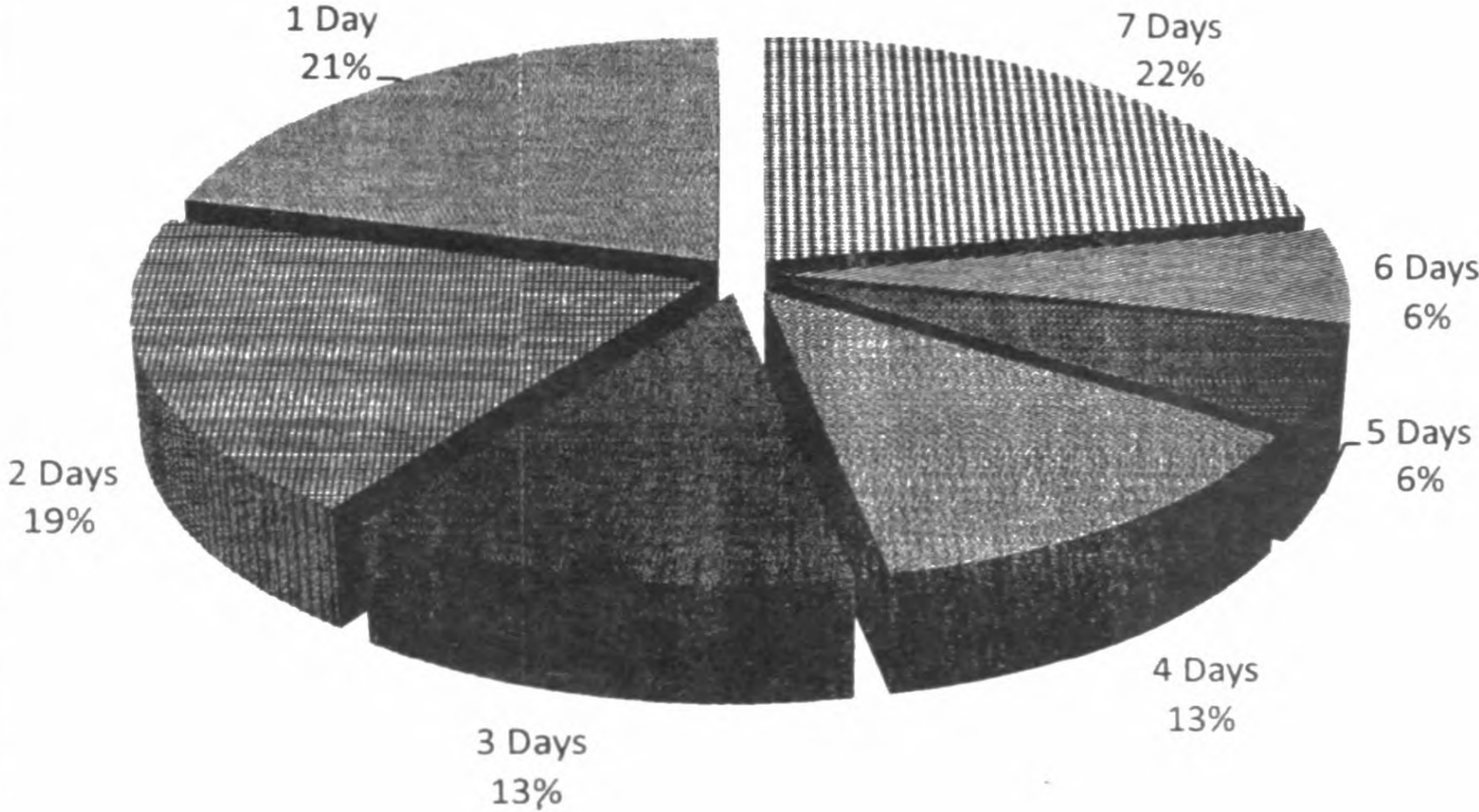
People at Kelegama, Malabe, Hunupitiya and Illawathura locations have been eating rice for three meals in one day, which is a percentage of 06 and less than 20 percent as their main food item is wheat based foods.

Considering the situation of the study areas, consuming areas had been compelled to consume rice for 2 meals.

3.2.8.8 The Pattern of Eating Rice for Two Meals/day

Eating rice for two main meals/day is not high. The range of percentages of eating rice in two meals from seven days to one day is between 23 to 06 percent, revealing that all are below 25 percent. Consuming rice for two meals in seven days is the highest for 23 percent while it is for one day for 21 percent meals in seven days. It is the highest in Ruwaneliya, entirely a consuming area situated in a Tea Estate (Pedro Estate in Nuwara Eliya). The usage of wheat flour based foods in the estates is declining according to our study observations. Eating rice in two meals/day in six days is in a similar percentage in Kelegama, Malabe North and Hunupitiya. It is significant that the above locations are high consuming areas excluding Kelegama. For five days Hatamuna, Manewa and Kelegama show a similar percentage of 33.

Eating rice for 2 meals/day for 4,3, and 2 days are of approximately similar percentages in both the producing and consuming areas as well. But all the percentages are below 50 percent.



Source: HARTI Survey data 2008/09

Figure 3.8.4: Percentages of Households According to Selected Locations Consuming Rice for 2 Meals per Day

CHAPTER FOUR

Rice in the Sri Lankan Diet

This chapter reviews the significance of rice in the Sri Lankan diet as the staple food and the differences in its consumption due to regional and other socio economic factors. The estimates made by the study on rice consumption at community level and at national level are presented.

4.1 Rice in the Ancient Sri Lankan Diet

Rice is the main food of the average Sri Lankan. From ancient times, Sri Lanka was known as a rice consuming country in Asia and the traditional Sri Lankan diet comprised mainly of rice, kurakkan, and yams. It was widely believed that a full grown male consumed a measure of rice a day i.e. 0.9 kg of rice per day (329 kg per year) besides kurakkan and other foodstuffs. Nevertheless, several changes had taken place in the Sri Lankan diet over the years. The 13th century onwards our traditional self-sufficient food system started to decline with the decline of irrigation network due to many factors including Indian invasions. Then after the European occupation, wheat was added to the traditional diet particularly among urban communities. In the recent history, Sri Lanka was categorized as a rice-wheat importing country in Asia. Rice availability during 1940s was only 60kg per capita per year. During the Second World War, the country was heavily dependent on wheat imports mainly from Australia to meet the food shortages. There were also changes in the dietary pattern after migrant labour was brought to work in plantations.

4.2 Current Status of Rice Consumption in Sri Lanka

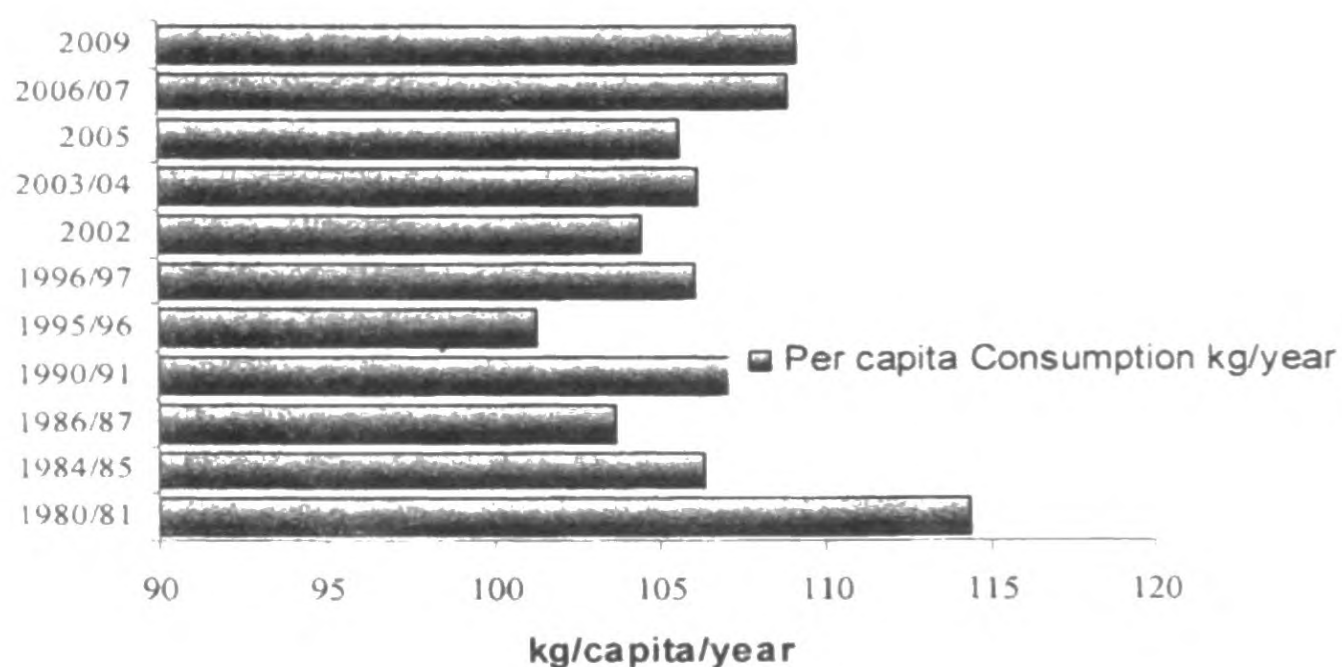
At present, rice is the main food of an average Sri Lankan. Nevertheless, wheat provides 1/4th of calorie supplied by cereals of an average Sri Lankan. If rice consumption in Asia is compared, per capita consumption of rice of an average Sri Lankan is relatively low.

During the last five decades, per capita availability of rice has been fluctuating around 90- 120kg per year (105 kg per year on average) and the wheat availability has been 20- 40kg per year (25 kg per year on average) in the country. Per capita availability of rice and wheat from 1960s also illustrates that the capacity of the country to produce rice has affected food habits, especially the wheat consumption. During the years of low production of rice, wheat has supplemented the calorie requirement of an average Sri Lankan. It is also noted that per capita rice and wheat consumption has marginally increased over the decades.

Table 4.1: Per Capita Rice Consumption in Asia (Per Year/ Kg)

Country	Per Capita Rice Consumption	Country	Per capita Rice Consumption
Myanmar	239.7	Korea, Republic of	75.9
Viet Nam	186.6	India	74.0
Indonesia	158.0	Korea, D.P.R.	73.4
Bangladesh	157.5	Japan	60.0
Thailand	130.4	of which Taiwan Prov.	45.4
Philippines	120.3	Iraq	41.7
Sri Lanka	113.9	Saudi Arabia	35.4
Malaysia	81.7	Iran, Islamic Republic of	33.8
China	76.8	Pakistan	15.2

Source: FAO, 2008



Source: Department of Census and Statistics

Figure 4.1: Per Capita Rice Consumption

Consumption surveys conducted by the Department of Census and Statistics and Central Bank of Sri Lanka also show that the per capita rice consumption has been around 100-114 kg per year in the last few decades (Figure 2 & Table 2).

Table 4.2: Per Capita Rice Consumption

Year	Source	Per Capita Rice and Rice Products Consumption
1980/81	HIES, 1980/81	114.4
1984/85	HIES, 1984/85	106.4
1986/87	SE&CF Survey, 1986/87	103.7
1990/91	HIES	108.5
1995/96	HIES	101.3
1996/97	SE&CF Survey, 1996/97	106.1
2002	HIES 2002	104.5
2003/04	SE&CF Survey, 2003/04	106.2
2005	HIES 2005	105.7
2006/07	HIES 2006/07	108.9
2009	HIES2009	109.2

Source: Department of Census and Statistics, Central Bank

4.3 Rice Consumption Pattern among Different Communities in Sri Lanka

When the general consumption pattern is concerned, rice is yet a common food in Sri Lanka. Because of the increase in average income, drop in rice prices, and increase in the prices of substitute foods particularly wheat, consumers tend to buy more rice for consumption. Nevertheless, regionalized food consumption patterns are influenced by many factors and complex interactions. Sub national availability, socio-economic level and income, prices, individual preferences and beliefs, cultural traditions, as well as geographical, environmental, social and economic factors all interact in a complex manner to shape dietary patterns.

According to the seven day diet-diary estimates, an average Sri Lankan consumes 114.7kg of rice and rice based foods such as *string-hoppers*, *hoppers* and *rotti* per year in their daily diets. Bread together with other wheat based products amount to 40.04 kg of wheat consumption per year.

Table 4.3: Average Rice Consumption of a Sri Lankan, 2009

Country	Quantity	Rice & Rice Products	Wheat and Wheat Products
Sri Lanka	grams/day	314.1	109.69
	Kg/year	114.7	40.04

Source: HARTI, 2008/2009

It was revealed that there are different characteristics among different communities with respect to rice consumption due to factors such as availability of paddy at home for consumption, the origin, ethnicity and culture related food habits, livelihood and life style. People in the paddy producing areas prepare rice for all three meals. Semi-urban middle income dwellers who are the migrants for educational and occupational purposes to urban centers continue to maintain their food habits. Most of them also prepare rice for three meals. Lower income urban dwellers in shanties that represent a larger section of population in the Colombo Municipal Council, primarily depend on food purchased from outside as they lack adequate facilities for cooking and their occupations are highly transient. Therefore rice consumption among these communities is limited only to lunch. The Estate Tamil community is used to prepare rice for their lunch and dinner and the popular *Ata Rotti* for breakfast.

Per capita rice consumption of these communities is given below. (Table 4. 4)

Table 4.4: Rice Consumption Pattern in Different Communities in Sri Lanka, 2008/09

Community Group	Study Location	Rice & Rice Flour	
		Grams per day	Kg per Year
Paddy farming communities under major irrigation	Hatamuna, Polonnaruwa	351.8	128.4
Paddy farming communities under major irrigation	Manewa, Anuradhapura	359.2	131.1
Paddy farming communities under rainfed	Kalegama, Kurunegala	387.7	141.5
Chena Farmers	Wattegma, Monaragala	457.8	167.1
Semi-urban middle income dwellers	Malabe, Colombo	363.6	132.7
Estate Tamil Community	Ruwaneliya, Nuwaraeliya	305.1	111.4
Lower Income urban dwellers in Shanties	Hunupitiya, Colombo	76.6	78.0
Muslim Communities	Illawathura, Kandy	211.1	77.1

Source: HARTI Survey 2008/2009

4.4 Varietal Preference of Rice by Different Communities

Raw (*Kekulu*) rice, white and red, is the widely consumed rice in the Sri Lankan diet. Nevertheless, in different regions, varietal preference is traditionally linked with their

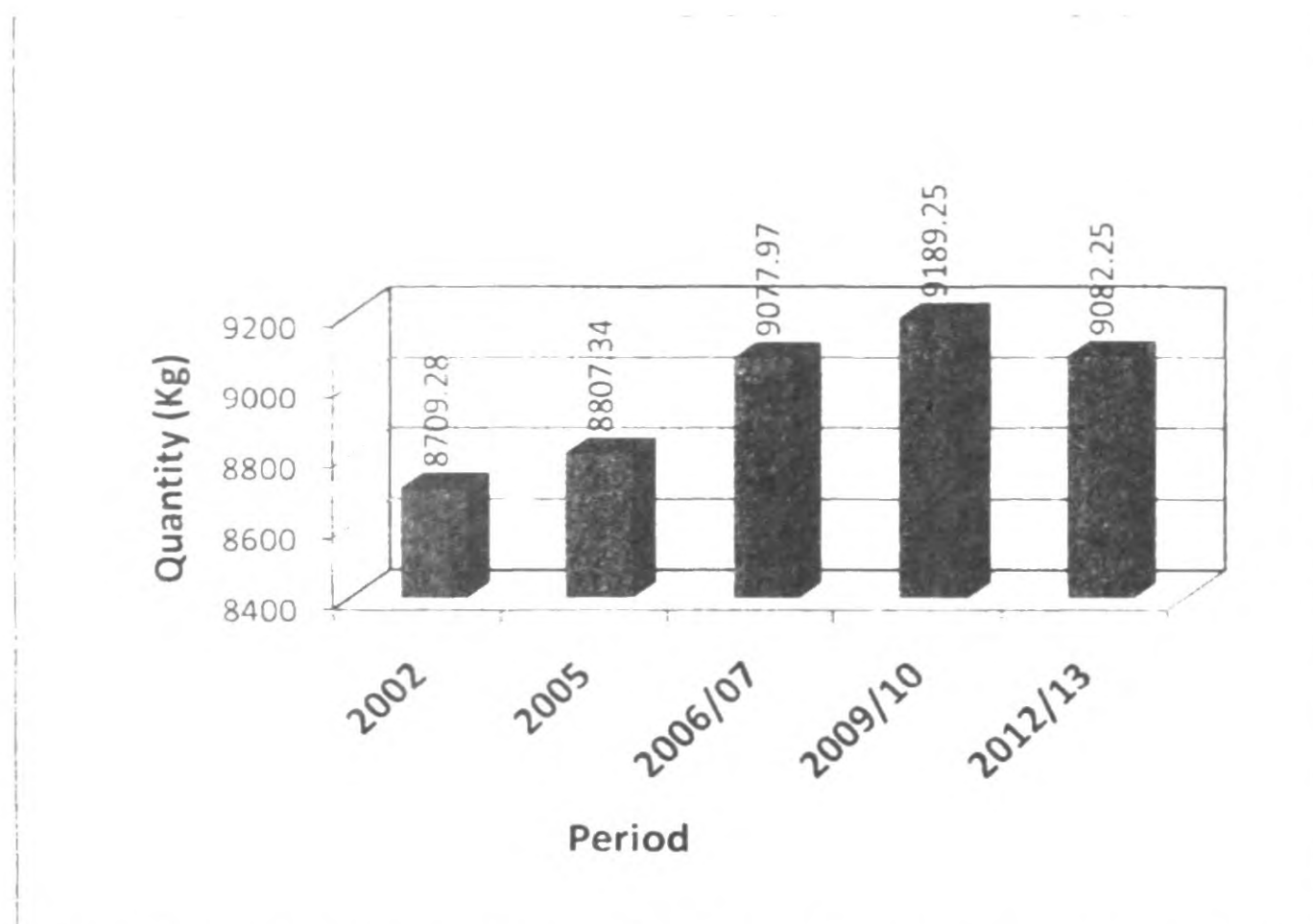
food habits. Parboiled rice is largely consumed by North Central and North Western provinces where major parboiling mills are located. Towards the South, mainly raw rice is consumed. Parboiled long grain rice (*Nadu*) is consumed by low income groups while parboiled short grain rice (*Samba*) is consumed particularly by high income groups.

According to the estimates by HIESs conducted by Census and Statistics Department in the recent years, 37kg to 51kg of *Kekulu*, 34 kg to 38 kg of *Nadu* and 18 kg to 26 kg of *Samba* rice have been consumed by an average Sri Lankan per year.

Table 4.5: Monthly Per Capita Consumption of Rice Varieties and Rice Flour (Grams)

Type	2002	2005	2006/07	2009/10	2012/13
Rice (Samba)	2212.15	1250.96	1780.51	1642.63	1450.34
Rice (Nadu)	2837.62	3196.46	2903.23	3277.99	3287.83
Rice (Kekulu)	3159.91	4248.75	4307.12	4127.29	4034.12
Rice (Other)	444.28	7.31	4.28	14.11	110.71
Rice Flour	55.32	103.86	82.83	127.23	199.25
Total	8709.28	8807.34	9077.97	9189.25	9082.25

Source: Household Income and Expenditure Survey - Department of Census and Statistics



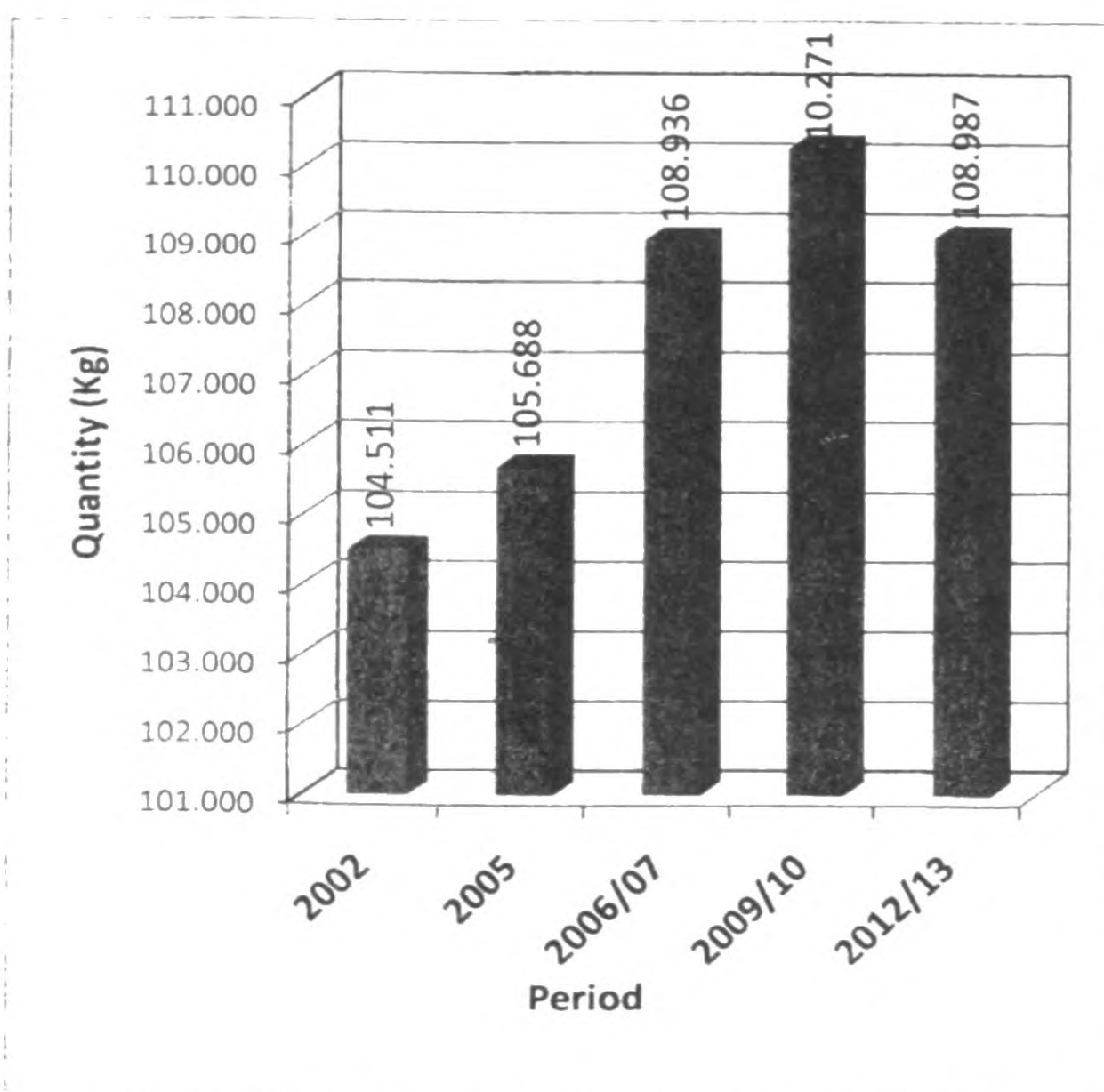
Source: Household Income and Expenditure Survey - Department of Census and Statistics

Figure 4.2: Monthly Per Capita Consumption of Rice Varieties and Rice Flour by (Person/Grams)

Table 4.6: Annual Per Capita Consumption of Rice Varieties and Rice Flour (Kg)

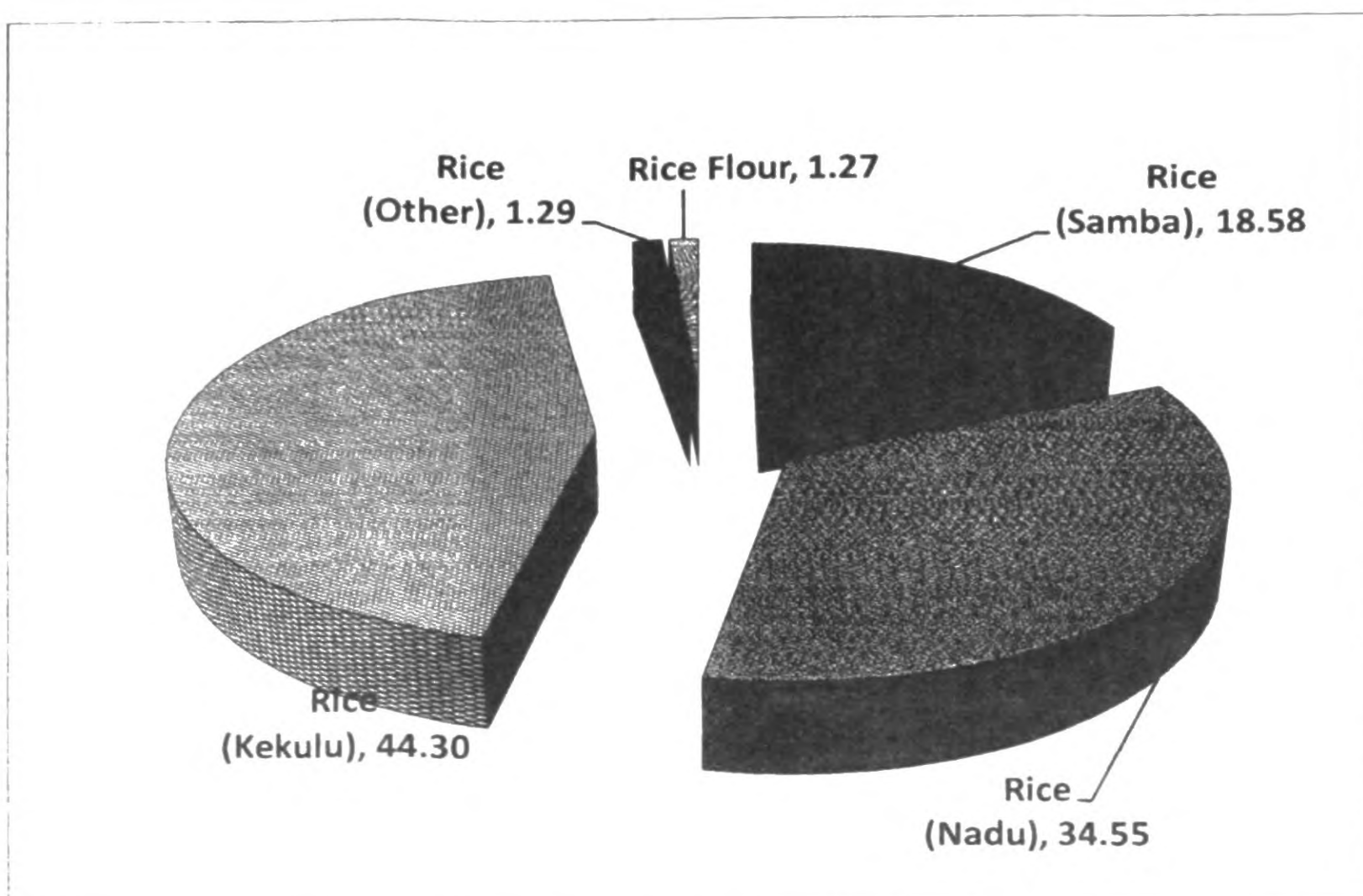
Type	2002	2005	2006/07	2009/10	2012/13
Rice (Samba)	26.546	15.012	21.366	19.712	17.404
Rice (Nadu)	34.051	38.358	34.839	39.336	39.454
Rice (Kekulu)	37.919	50.985	51.685	49.527	48.409
Rice (Other)	5.331	0.088	0.051	0.169	1.329
Rice Flour	0.664	1.246	0.994	1.527	2.391
Total	104.511	105.688	108.936	110.271	108.987

Source: Household Income and Expenditure Survey - Department of Census and Statistics



Source: Household Income and Expenditure Survey - Department of Census and Statistics

Figure 4.3: Annual Per Capita Consumption of Rice Varieties and Rice Flour (Kg/Person)



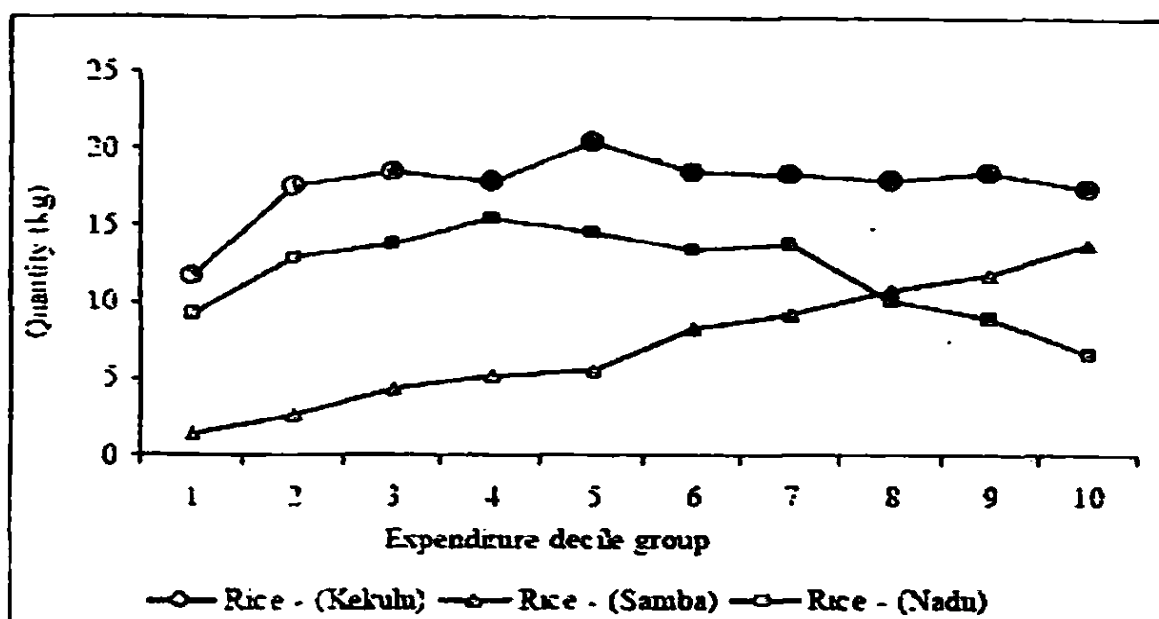
Source: Household Income and Expenditure Survey - Department of Census and Statistics

Figure 4.4: Percentage Consumption of Rice Varieties

Table 4.7: Average Monthly Household Consumption Quantities of Selected Food Items

District	Rice (Kekulu) (kg.)	Rice (Samba) (kg.)	Rice (Nadu) (kg.)	Wheat flour (kg.)	Bread (Normal) (kg.)
Colombo	13	1.8	3.9	1	10.4
Kandy	12.2	5.3	18	4.4	5.9
Nuwara Eliya	16.1	3.8	19.1	15.3	3.9
Kurunegala	3.5	8.6	25.3	1.3	3.8
Anuradhapura	13.7	8.4	15.3	1.7	3.5
Polonnaruwa	7.3	7.2	27.8	1.6	3.1
Monaragala	47.6	1	0.5	1.4	2

Source: Household Income and Expenditure Survey - Department of Census and Statistics



Source: Household Income and Expenditure Survey - Department of Census and Statistics

Figure 4.5: Average Monthly Household Consumption of Rice Varieties by National Household Expenditure decile 2006-2007

Table 4.8: Consumption of Rice Varieties - Hatamuna

Variety of Foods

Nos.	Par boiled	Samba	Raw white	Raw red	Noodles	Bread
1	60.5	28 ^o	11	0.5	0.1	0.1

Source: HARTI Survey data 2008/2009

Out of the total number of meals, par boiled rice variety is popular among the villagers. The percentage consumption is 58 percent. Samba, raw white and raw red have been consumed in low percentages. Priority has been given to eating rice, hence other foods are eaten rarely in small quantities.

Illawathura

Unlike other study locations, Illawathura people have consumed many varieties of rice; samba, raw red, nadu and raw white. Among those, nadu consumption is the highest which is 43 percent, samba (39 percent), raw white 12 percent and raw red 6 percent). The high income recipients normally eat samba varieties while middle income people which is prefer for the nadu variety. Due to health reasons like diabetic, some have been compelled to eat raw red varieties.

Ruwaneliya

More meals (39%) consist of the nadu variety, low price is the main reason for its consumption. Taste of it is highly preferred by them. Samba is preferred only in 24 percent of meals. The lowest preference (2%) was for raw red.

Manewa

Table 4.9: Consumption According to Different Food Items

Rice Varieties	Percentage
Parboiled	50
Samba	10
Raw white	33
Cereals and other subsidiary total crops	7

Source: HARTI Survey data 2008/2009

Parboiled, samba and raw white varieties are eaten in the Manewa area. Half of the population preferred the parboiled rice variety. They believe nutrition value is high in parboiled rice. Samba variety does not have a higher preference among them. According to their views, preference for these rice varieties does not depend on the prevailing prices but only on the preference they inherited from their families.

Hunupitiya

Table 4.10: Consumption of Rice Varieties

Variety	Percentage
Raw white	40
Nadu	30
Samba	20
Raw red	10

Source: HARTI Survey data 2008/2009

Due to the low prices of raw white and nadu varieties, Hunupitiya residents prefer those two varieties mostly. Raw red variety is popular mostly among the immigrant people from the Southern Province.

Kelegama

The Rice Varieties Consumed

The highest preference is for the nadu variety in this area. Nadu consumption is high (55%) according to the number of meals in a week. The belief that nadu variety has high nutrition, the big size of the seed and the special taste of it are the factors influencing consumption.

2nd priority is for the raw white rice. It is easy to cook and takes little time to cook.

The common pattern in this area is eating raw white for breakfast. The rest of the meals are consumed with nadu and raw red. Samba varieties seem to be less preferred in this location.

Wattegama

The rice varieties included in their meals are only raw white and raw red. Other varieties are not consumed. Regionally this is a common habit. Thus raw white consumption counts as 85 percent and raw red 15 percent.

Malabe

Table 4.11: Consumption According to Different Food Items

Variety of Foods	% of Consumption (households)
Rice Variety- Samba	34
Raw white	24
Raw red	14
Nadu	03
Bread	04
Rice flour based foods	09
Rice + Noodles} mixed	04
Rice + Bread} mixed	
Rice + Rotti (Wheat flour or Rice flour)}mixed	
3Wheat flour rotti+ string hoppers	04
Noodles	02
Green gram, cowpea or kurakkan	03

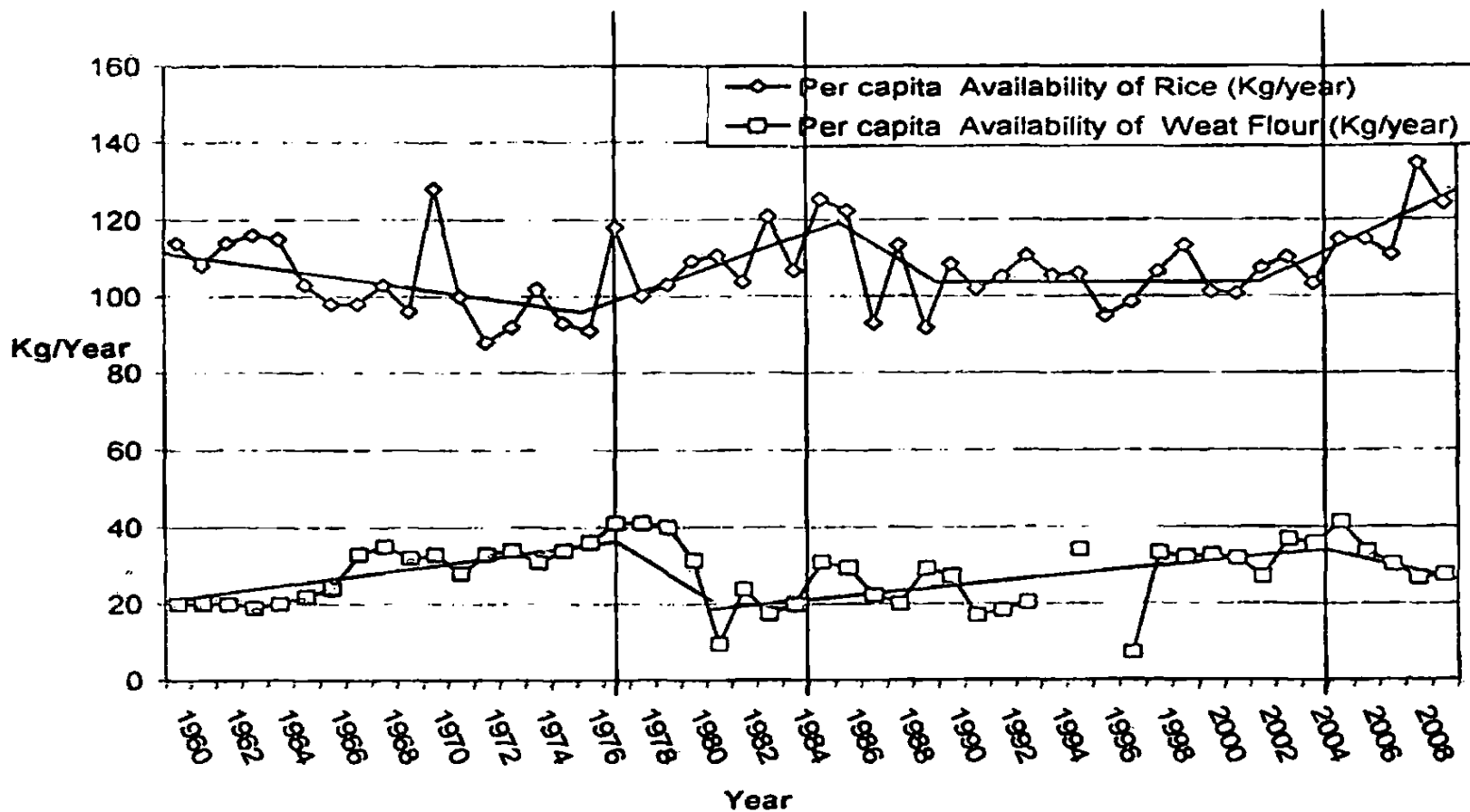
Source: HARTI Survey data 2008/2009

The above information reveals that people prefer samba varieties to other varieties. Samba, raw white and raw red have the above percentages as this area is populated

with people from different provinces. Specially, raw red is eaten by the people coming from the Southern Province.

4.5 Factors Determining Rice Consumption in the Recent Past

Three main factors determine the level of rice consumption of any group at a time: taste and preference, income, and the price of rice in relation to the substitutes. These three factors are interactive and interwoven. Taste and preference of urban people generally differ from those of rural people because of the differences in life-style and level of physical activity. The taste of one ethnic group within a country may differ from those of another group. Changes in the price of rice will have an effect on consumption because rice becomes more or less expensive relative to other alternatives, where rice absorbs a large fraction of total expenditure, a change in its price has substantial effects on real income.



Source: Department of Census and Statistics

Figure 4.6: Per Capita Rice and Wheat Availability, 1960 to 2009

Table 4.12: The Current Trend of Consumption of Bread and Wheat Flour Based Foods

Study Location	Breakfast		Lunch		Dinner	
	Wheat Flour based Foods	Bread	Wheat Flour based Foods	Bread	Wheat Flour based Foods	Bread
Manewa	24	28	20	20	20	22
Hatamuna	24	18	14	16	28	28
Kelegama	22	22	12	10	16	22
Wattegama	56	32	22	20	28	20
Malabe	37	27	07	13	17	17
Vauxhall Street	19	08	08	08	16	11
Ruwaneliya	33	18	25	14	31	10
Illawathura	23	40	20	27	23	37

Source: HARTI Survey data 2008/2009

According to the information revealed by the above Table, the consumption of bread and wheat flour based foods have decreased specially for breakfast and dinner. The lunch is normally served with rice. Hence the influence of other food items are not regarded for lunch. Price decrease is the main reason followed by the people's increased awareness of healthy meals specially in the case of diabetes.

Per Capita One Month Consumption

Standard Loaf	Grams	1,719
Special Loaf	Grams	37

Table 4.13: Monthly Average Retail Price of Bread – Sri Lanka

	1997	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Jan	7.31	8.45	8.50	8.90	11.23	13.09	13.35	14.55	16.55	22.32	36.45
Feb	7.31	8.45	8.50	8.93	11.47	13.49	13.35	14.81	16.78	23.14	36.89
Mar	7.31	8.44	8.50	9.12	11.39	13.23	13.35	15.73	17.11	23.78	37.63
Apr	7.31	8.44	8.50	9.14	11.24	13.28	13.35	16.37	17.39	24.22	37.63
May	7.31	8.44	8.50	9.18	11.48	13.28	13.35	16.61	18.68	25.41	37.63
Jun	7.31	8.44	8.24	9.16	11.38	13.31	13.50	16.57	18.48	26.30	37.85
Jul	7.31	8.45	7.65	9.16	11.50	13.35	13.57	16.25	18.46	26.79	37.93
Aug	7.81	8.45	7.70	9.03	11.37	13.36	13.58	15.95	18.95	28.32	38.05
Sep	8.23	8.45	7.79	9.19	11.39	13.41	13.96	16.09	20.24	28.66	37.81
Oct	8.21	8.45	7.83	9.24	11.39	13.41	14.26	16.29	21.24	33.99	37.80
Nov	8.24	8.48	8.01	9.44	11.82	13.41	14.36	16.45	22.36	34.77	37.59
Dec	8.25	8.48	8.76	10.36	11.91	13.40	14.54	16.31	22.26	35.31	37.68
Avg.	7.66	8.45	8.21	9.24	11.47	13.34	13.71	16.01	18.98	27.75	37.58

Source: Department of Census and Statistics, 1998=NA

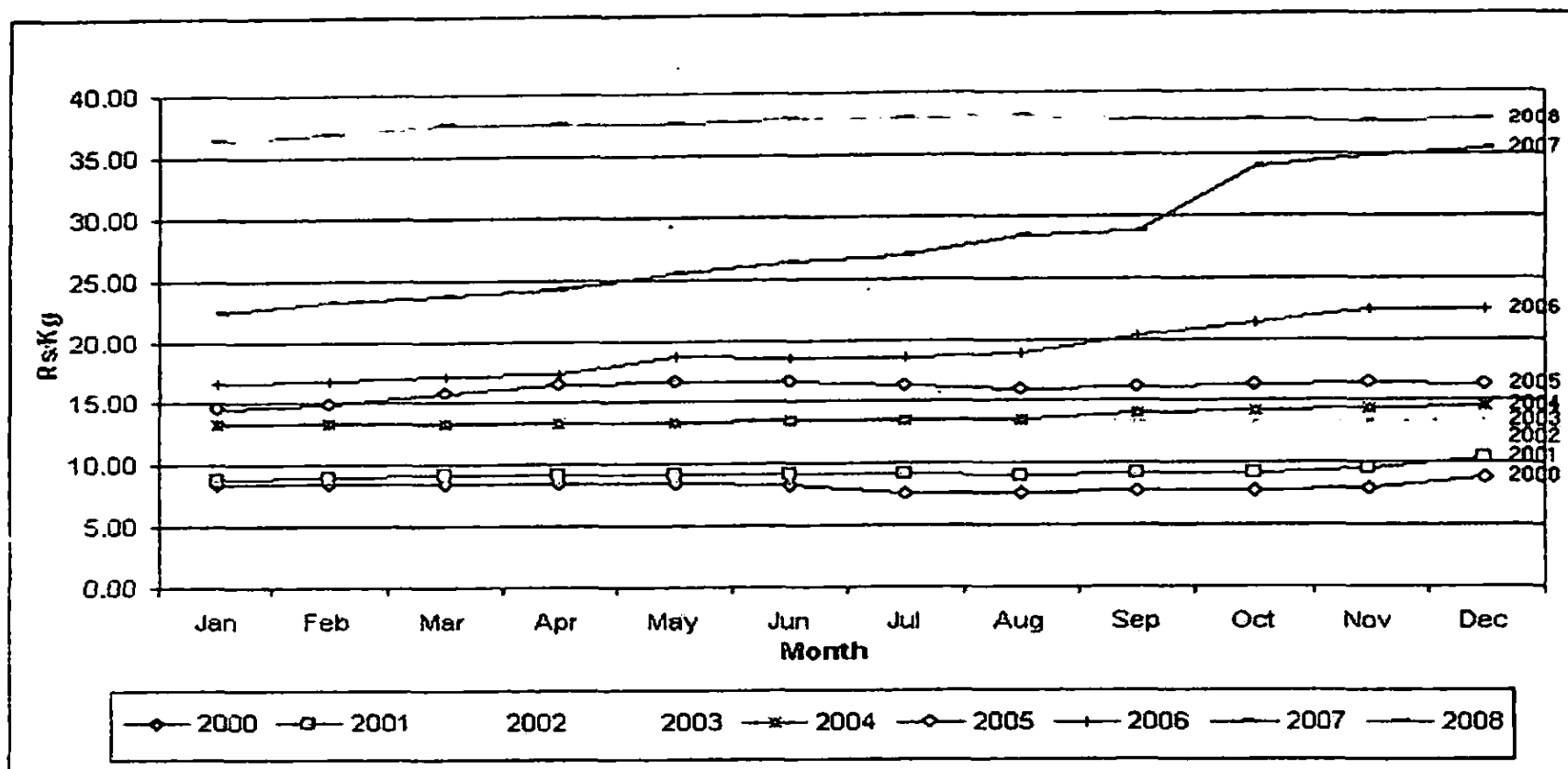


Figure 4.7: Monthly Average Retail Price of Bread

4.14: Monthly Average Retail Price of Wheat Flour

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Jan	17.21	19.29	19.28	19.03	17.93	22.01	24.22	25.30	27.74	29.84	38.35
Feb	17.21	19.29	19.35	19.07	18.10	21.71	24.79	25.37	27.94	30.20	39.73
Mar	17.21	19.29	19.39	19.08	18.19	21.39	24.41	25.37	30.32	30.90	40.93
Apr	17.21	19.29	19.39	19.08	18.17	21.31	24.66	25.35	29.41	32.21	41.08
May	17.24	19.29	19.42	19.20	18.20	21.54	24.69	25.35	29.29	32.50	43.45
Jun	17.24	19.29	19.42	18.93	18.32	21.60	24.74	25.16	28.16	32.44	44.57
Jul	17.24	19.34	19.41	16.24	18.32	21.94	24.98	25.15	26.98	32.64	45.81
Aug	18.01	19.34	19.41	15.70	17.97	22.02	25.07	25.37	28.17	33.64	48.52
Sep	19.16	19.38	19.41	15.69	19.06	22.20	25.08	26.08	29.23	35.73	48.97
Oct	19.23	19.38	19.11	15.78	19.25	22.07	25.08	26.64	29.33	38.70	61.24
Nov	19.27	19.38	18.92	16.07	19.44	22.68	25.08	26.89	29.50	39.92	61.42
Dec	19.29	19.40	18.61	16.99	20.05	23.11	25.11	27.34	29.56	39.96	62.83
Avg.	17.96	19.33	19.26	17.60	18.58	21.96	24.83	25.78	28.81	33.99	47.91

Source: Department of Census and Statistics

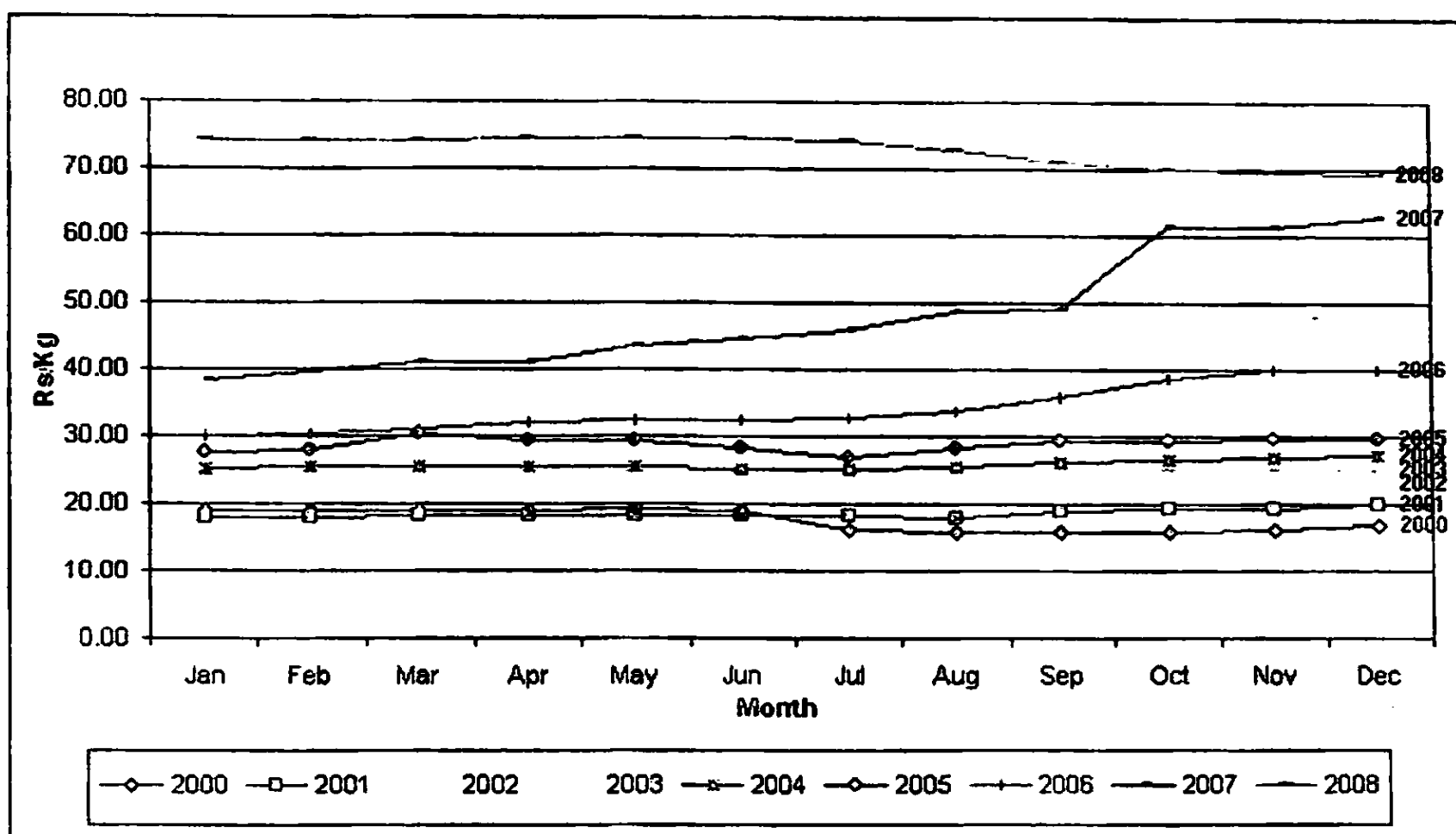


Figure 4.8: Monthly Average Retail Price of Wheat Flour

4.6 Rice Based Industries

Table 4.15: Identified Rice Based Industries

Preferred Food Item	Study Location							
	Manewa %	Hatamuna %	Kelegama %	Watte gama %	Malabe %	Vauxhall Street %	Pedro Street %	Illaw atura %
String hoppers	96	94	85	73	90	80	62	80
Plain hoppers	50	55	38	74	55	17	12	37
Rice flour rotti	66	47	48	20	35	17	28	33
Rice flour pittu	72	51	44	33	52	57	72	63
Rice flour noodles	30	26	6	4	28	17	5	10
Thosai	-	9	-	-	7	23	56	13

Source: HARTI Survey data 2008/2009

There is a number of food items which could be substituted for rice but at present they are made of wheat flour. But it could be substituted with rice flour. Making rice flour is a long process. The raw white rice is first soaked in water and then ground with the grinding mill to make rice flour. Rice flour cannot be stored for several days as it

becomes rotten. Therefore, avoiding this is needed. But if it is available, processed rice flour could be bought at the market according to their need. The field survey revealed that string hoppers made of rice flour is very popular among people of all the study locations. Secondly rice flour pittu is popular in majority of study locations. Plain hoppers, and rotti are also popular in all study locations but less. Due to the crisis prices of wheat flour are increasing and there is a perception that wheat flour is not good for health. On the other hand, the Sri Lankan government is enthusiastic in developing paddy farming. Due to those reasons there is a potential for rice flour industry. Village facilities could be expanded to process rice flour. The aged population demand red rice flour due to health reasons. Therefore, there is a potential for developing rice flour. In addition to that, noodles are also popular among the people. Rice flour could be used for making noodles. In addition, there are continuous lab research to make bread and biscuits and chocolate out of rice flour.

In areas like Malabe there are several rice flour food mobile centers and some houses are making rice flour based foods such as string hoppers.

Already several Sri Lankan food processing companies like Alli, Raigam and Harischandra produce rice flour. Thus, there is a potential for the rice flour industry. According to recent information on biscuit companies such as Munchee, there is a possibility to replace wheat flour with rice flour in the production of biscuits. They have just introduced products which include rice flour and further experiments are being carried out.

Table 4.16: Identified Rice Based Industries in Field Survey

Industries	Study Locations							
	Manewa %	Hatamuna %	Kelegama %	Wattegama %	Malabe %	Vauxhall Street %	Pedro Street %	Illawatura %
1	51	46	41	35	25	27	38	22
2	16	20	5-	-	45	27	14	6
3	22	20	23	29	25	23	10	50
4	2	3	-3	-	20	-	-	6
5	2	14	3	15	10	13	5	11
7	-	-	-	-	5	-	-	-
8	-	-	-	-	5	-	-	-
9	2	2	-	3	10	-	-	-
10	10	4	18	24	10	-	5	6
11	7	3	5	9	5	-	-	-
12	-	-	5	3	-	13	33	22
13	1	-	-15	-	-	-	-	-

Source: HARTI Survey data 2008/2009

Though many rice based industries have been proposed by respondents, marketing rice flour, rice noodles, string hoppers and plain hoppers are suggested by a majority as innovative and marketable rice based productions are among them. Institutions and Authorities related to research and development must be responsible for innovations and explorations. Respondents have stated these opinions.

Industry codes

1. Marketing rice flour
2. Preparing instant rice noodles
3. Making string hoppers using rice flour
4. Making bread using rice flour
5. Making hoppers using rice flour
7. Making thosei using rice flour
8. Making samaposhha using rice flour
9. Making biscuits using rice flour
10. Making sweets using rice flour
11. Making short-eats- using rice flour
12. Making pittu using rice flour
13. Domestic rice processing industry

CHAPTER FIVE

Consumption of Other Food Crops

Present trends and location specific consumption are discussed in the very beginning of this chapter and consumption patterns of the traditional foods such as jak, bread fruit and yams are also considered within the chapter. Consumption of cereals is a different area.

5.1 Consumption of Other Cereals and Pulses

Consumption of cereals is different area-wise. Among producing and non-producing areas it varies to a large extent. In producing areas it depends according to the harvesting season. Hence the study targeted two months of the season and investigated according to different frequency levels.

Table 5.1: Consumption of Other Cereals and Pulses per Two Months - Hatamuna

Crops	< 5 days	< 10 days	< 15 days	< 20 days	Daily
Maize	55	17	19	6	2
Kurakkan	79	8	8	0	4
Green Gram	93	4	3	0	0
Cowpea	90	5	5	0	0

Source: HARTI Survey data 2008/2009

Consumption of main crops such as maize, kurakkan, green gram and cowpea is rare in this area. The people in the study areas are not natives in the dry zone. Most of them are settlers from various parts of the island. They do not prefer the rough taste and higher prices of these other food items. As most of the schools have recommended cowpea as part of students' meal, there is a positive trend of eating cowpea.

Table 5.2: Consumption of Other Cereals and Pulses per Two Months – Kelegama

Crops	< 5 days	< 10 days	< 15 days	< 20 days	Daily	Not consumed
Maize	18	12	27	25	20	02
Kurakkan	27	4	20	5	5	2
Green Gram	51	29	10	7	3	0
Cowpea	57	29	5	7	2	0

Source: HARTI Survey data 2008/2009

During the *maha* season people in the area grow cowpea mainly as a chena crop. Maize consumption has spread over the frequencies of less than 5 days, 10 days, 15 days and 20 days. Less than 15 days consumption is the highest for maize among the households. Compared to other cereal crops maize consumption is rather higher and spread across all the frequencies.

Kurakkan rotti, thalapa and string hoppers are popular at present. The production of kurakkan has decreased as the younger generation is away from cultivating chenas.

As the extent of green gram and cowpea is deteriorating, the people have to depend on the markets than earlier.

Table 5.3: Consumption of Other Cereals and Pulses per Two Months –Wattegama

Crops	< 5 days	< 10 days	< 15 days	< 20 days	Daily	Not Consumed
Maize	20	02	10	30	46	0
Kurakkan	40	25	21	12	02	0
Green Gram	80	12	02	02	0	02
Cowpea	55	23	13	06	0	02
Long beans	13	38	38	11	0	0

Source: HARTI Survey data 2008/2009

Maize, green gram and cowpea are cultivated in this area as a chena crop. Maize is grown more than other crops in the *Maha* season. During the harvesting season, people eat more immature corns of maize for main meals. As an accompaniment with alcohol, it is very popular. They have separate storage facilities for maize for sale and consumption during the off season. Flour of dry maize seeds is used as a main ingredient to make several food items as rotti, thalapa and aggala. Those foods are very tasty and nutritious.

This situation is revealed well in the seven-day diet diary information. Kurakkan thalapa is popular among respondents of the study area.

Green gram is a main crop in this area and it is popular as a main curry and as a main food in main meals. Green gram is recommended in schools as a main food and hence it is popular among schoolchildren.

Long bean seeds are very popular in the area. Farmers cultivate long beans with maize crop. Green gram and cowpea can be eaten as a boiled food and a curry with rice.

Table 5.4: Percentage of Cereal Consumption per Two Months in Consuming Areas - Kaduwela-Malabe

Crops	< 5 days	< 10 days	< 15 days	< 20 days	Not Consumed
Maize	82	09	0	04	04
Kurakkan	72	12	12	04	0
Green Gram	61	25	11	04	0
Cowpea	61	11	22	06	0

Source: HARTI Survey data 2008/2009

According to the evidence from the study area, majority of (82% Maize, 72% Kurakkan and 61% Green Gram) households consume cereal less than five days in the season. It is recommended that schoolchildren bring cereal for lunch. Higher prices in the market are a barrier and hence its sale is threatened.

Table 5.5: Consumption of other Cereals and Pulses for Two Months in Vauxhall Street (Hunupitiya)

Crops	< 5 days	< 10 days	< 15 days	< 20 days	Not Consumed
Maize	92	0	0	0	08
Kurakkan	90	0	0	0	10
Green Gram	96	14	0	0	10
Cowpea	93	0	0	0	07

Source: HARTI Survey data 2008/2009

Maize: Households in the Vauxhall Street in Colombo eat a number of different types of food items for the main three meals. The majority of food items are based on rice or wheat flour foods for three meals. Therefore consumption of maize and kurakkan is very limited. The consumption of maize is very limited, because they mostly consume foods made of wheat flour such as biscuits and other bakery products. They eat maize as a supplement but not for the main meal. The survey revealed that a very limited number of households have eaten maize for less than 5 days during the season. They also bought boiled maize from wayside vendors.

Kurakkan: Eating kurakkan based foods is less popular in the study area, because people of the area eat wheat flour based foods other than rice. Therefore, there is no place for other food items. Especially persons who are concerned over health eat kurakkan foods. The other reason is that multi racial people live in the area namely Sinhalese, Tamil and Moor. The majority of the households prefer wheat flour based bakery foods. Hence, consumption of kurakkan foods is less popular.

Green gram: Consumption of green gram is higher than maize and kurakkan. Green gram is tastier and preparation is easy. The other reason is that children like to eat green gram mixed milk rice. People are aware of the nutritional value of green gram, thus, it replaces regular foods such as rice or wheat flour based foods.

Cowpea: It was reported that in the study area consumption of cowpea is considerably low. They have been used to eating rice and wheat flour based foods. Therefore cowpea is not popular like wheat flour based bakery products among these urban poor people. Hence, they rarely eat cowpea. On the other hand, the price of cowpea is higher than that of rice. According to the present situation, the price of a kilo of cowpea is equal to the price of two kilos of rice. Therefore, after comparing the prices, people decide to buy rice rather than cowpea. On the other hand, the price of 500 grams of cowpea equals to the price of two loaves of bread. Two loaves of bread are enough for 4 - 5 people, but 500 grams of cowpea is not enough for 4 or 5 people. People are reluctant to eat green gram and cowpea due to their high prices.

Table 5.6: Consumption of Other Cereals and Pulses for Two Months in Ruwan-eliya - Pedro Estate

Crops	< 5 days	< 10 days	< 15 days	< 20 days	Not Consumed
Maize	88	0	06	0	06
Kurakkan	67	24	05	0	05
Green Gram	81	17	02	0	0
Cowpea	83	14	0	0	03

Source: HARTI Survey data 2008/2009

Maize: This is an estate area where people live in line settlements and they totally depend on the market. People do not consume maize as a habit as in the producing areas. The other reason for the lack of consumption is maize is not a freely available commodity as in Monaragala or Siyambalanduwa. Wheat flour based rotti is popular among them. Hence, consumption of maize is very limited.

Kurakkan: It is reported that the number of households (15%) that consumed kurakkan based foods is low. It is because the estate workers have a long practiced habit of eating wheat flour rotti. They seldom eat kurakkan. The other reason is the high price of the kurakkan flour. The price of 1 kg of kurakkan flour is higher than that of rice. Another reason is that children do not like its taste. However, they are aware that kurakkan has a medicinal value to control diabetes.

Green gram: Green gram consumption is high among the estate people. They have food items based on green gram and it is part of their food culture. The study revealed that

green gram is consumed as a main meal for breakfast or dinner. Schoolchildren are also given green gram for their lunch. Due to above reasons, 30% of the households had eaten green gram for less than 15 days. The survey revealed that the price of green gram also affects the consumption.

Cowpea: According to the survey, estate people rarely eat cowpea. Due to inclusion of cowpea in the meal of schoolchildren cowpea consumption is rather popular among children. On the other hand, people want to change their normal food habit of eating rotti. Therefore they turn towards foods like cowpea and green gram. According to the survey 25% of households had eaten cowpea for less than 10 days per month, it means 2 or 3 meals per month.

Table 5.7: Consumption of Other Cereals and Pulses per Two Months in Illawatura – Udapalatha

Crops	< 5 days	< 10 days	< 15 days	< 20 days	Not Consumed
Maize	100	0	0	0	0
Kurakkan	91	0	09	0	0
Green Gram	92	08	0	0	0
Cowpea	94	06	0	0	0

Source: HARTI Survey data 2008/2009

Maize: Illawatura is a village where Moor people live. According to the survey results, they do not prefer cereals. They like to eat rice for lunch and wheat flour based foods for breakfast and dinner. Wheat flour has dominated their foods. It is a longstanding habit of the Muslim people.

Maize is not freely available in the Gampola area. The boiled maize vendors are few in the area. Therefore, people of the area have less opportunity to eat maize. A small number of households (24%) eat maize for less than 5 days per season.

Kurakkan: The survey has also reported that consumption of kurakkan is low. The reason was that people do not like to eat these rough foods. The people who are concerned about health, consume kurakkan flour based foods. Currently people prefer light and tasty foods more. Therefore, 13% of the households eat kurakkan for less than 5 days per month.

Green gram: Consumption of green gram is higher than consumption of kurakkan. The reason is green gram is tasty and children also like it. Therefore, sometimes they change their normal food consumption pattern and eat cereals like green gram. The survey revealed that 33% of the households eat green gram for less than 10 days per month.

Cowpea: Consumption of cowpea is also low. This community prefers rice, bread and wheat flour foods. Other reason for low consumption was high price and long duration for cooking. People prefer the foods which are low in price and easy to cook. Therefore, as a habit they eat rice and wheat flour foods. Twenty three percent of the families eat cowpea for less than 10 days per month. The consumption of cereals such as kurakkan, maize, green gram and cowpea is rare.

Hundred percent of the households in producing areas eat maize during the season of harvesting. The immature maize called "kirikaral" (tender corns) are very popular in the season. The immature corns are popular in most of the consuming areas. People eat it as a supplementary food. In the consuming area of Malabe 80% of households, 35% of the study households of Hunupitiya in Colomob, 31% of the study households of Pedro estate, and 63% of the study households of Illawathura have said they eat immature boiled maize. It has been developed as an agro based industry. Maize flour products are sold at present. The people have a longstanding habit of eating maize flour based foods in the producing areas. But at present due to development as an agro based industry, consumers could buy it from the market. Therefore maize flour based foods like "aggala" are popular among people. Today maize is a popular food item during the harvesting season and also in the off season all over the country.

Earlier, in Sri Lanka kurakkan was a traditional food item popular among the people of producing areas. But at present kurakkan flour production has developed as an agro based industry. Now the kurakkan flour could be bought from the market everywhere in Sri Lanka. On the other hand, today most of the urban people are concerned over their health. In this case kurakkan is a good food item for diabetic patients. Therefore, there is a demand for kurakkan flour. More than 84% of the study area households and producing areas' study households eat kurakkan. The semi urban area of Malabe also eats kurakkan flour more. It is reported that 83% of the study households eat kurakkan flour based foods such as string hoppers, rotti and halapa. The prominent food variety of kurakkan is popular all over the country. But according to the survey information children do not prefer kurakkan foods. It is preferred by elderly and sick people only. Out of the producing areas a less number of households in the producing area consume kurakkan foods. Health reasons prompt people to consume kurakkan.

Greengram and cowpea are important legumes in Sri Lanka. While green gram has a very long history, cowpea was introduced in 1970s. There are sweets called "mungkevim" connected to the Sinhala culture made with green gram flour. Therefore, green gram has a strong connection with all the three communities, Sinhala, Tamil and Muslim. The popular preparation is the boiled green gram. In addition, milk rice with green gram is very popular among people. Eating of green gram foods is preferred by all; elderly and children alike. Therefore eating green gram was at a higher number in all the study locations. Green gram is eaten as a curry as well. Specially, the field survey found that the Tamil people eat boiled green gram with rice. The survey shows more than 70% of people in all of the study locations eat green gram. There is an agro based industry developing with regard to cowpea, green gram and others.

Cowpea is also a popular food variety among the people. But there is no developed agro based industry with regard to cowpea. Cowpea products are not processed as green gram. Therefore the only way is boiling. On the other hand, cowpea is consumed as a curry with rice. As a curry, cowpea and green gram are substituted for Maisoor dhal. Therefore the study households of producing area reported more than 85% of consumption. In other areas it is more than 42%. The people of the producing areas use cowpea as a accompaniment to go with liquor. Cowpea is used as a curry and substituted for Maisoor dhal. The table 5.8 shows the situation.

Table 5.8: Consumption of Cereals

Study Location	Responses	Cereals					
		Maize	Kurakkan	Green gram	Cowpea	Sorghum	Meneri
Manewa	Yes	50 100%	47 96%	49 98%	47 94%	-	2 85%
	No	-	3 4%	1 2%	3 6%	-	-
Hatamuna	Yes	50 100%	34 68%	41 82%	30 62%	-	1 2.2%
	No	-	16 32%	9 18%	18 38%	49 0%	45 97.6%
Kelegama	Yes	50 100%	42 84%	44 88%	44 88%	-	-
	No	-	8 16%	6 12%	6 12%	-	-
Wattegama	Yes	50 100%	41 9%	36 72%	48 92%	1 2%	-
	No	-	3 6%	14 28%	4 8%	49 98%	50 11%
Malabe	Yes	24 80%	24 83%	29 47%	19 63%	1- 3%	1- 4%
	No	6 20%	6 17%	1 3%	11 37%	29- 97%	29- 96%
Vauxhall Street	Yes	13 35%	8 22%	29 78%	15 42%	-	-
	No	24 65%	28 78%	8 22%	21 58%	-	-
Pedro Street	Yes	15 31%	24 49%	47 94%	34 69%	-	-
	No	34 69%	25 51%	3 6%	15 31%	-	-
-Illawathura	Yes	19 63%	11 37%	28 93%	22 73%	-	-
	No	11 37%	19 64%	- 7%	8 27%	-	-

Source: HARTI Survey data 2008/2009

5.2 Consumption of Other Foods - Jak, Breadfruit and Yams

5.2.1 Consumption of Jak

Jak is called “rice tree” due to its paramount importance as a source of food. Fruits are a valuable food item which are eaten at various stages of maturity. Immature fruits are called ‘Polos’ and mature fruits ‘Kos’ while ripe ones are called ‘Waraka’ or ‘Wela’. Tender portion and seeds of the mature fruit are boiled and eaten. Immature fruit is used for preparing ‘polos mallum’ and ‘polos ambula’ (curry). Tender segments of ripe fruits (*wela and waraka*) have an aroma and are sweet in taste. Sun-dried segments and seeds are eaten during the off-season. Young leaves are eaten as a green vegetable. (Rajapakshe, 1998).

5.2.1.1 Nutritional and Therapeutic Value

Jak fruit contains a high nutritional value as follows.

Table 5.9: Nutritional Value of Jakfruit

Constituent	Fruit		
	Immature	Ripe (Pulp)	Seed
Moisture (%)	85.20	72.40	57.60
Food Energy.cal	51.00	97.00	43.00
Protein, g	2.00	1.40	5.60
Fat, g	0.60	0.40	0.60
Total carbohydrates, g	11.50	24.00	34.90
Fiber, g	2.60	0.80	1.40
Ash, g	0.70	1.00	1.30
Calcium, mg	53.00	23.00	23.00
Iron, mg	0.40	1.10	0.80
Sodium, mg	3.00	2.00	3.00
Potassium, mg	323.00	107.00	763.00
Vit A.I.U.	30.00	175.00	-
Thiamine, mg	0.12	0.90	0.60
Rivoflavin, mg	0.05	0.05	0.06
Niacin, mg	0.50	0.90	0.60
Ascorbic Acid, mg	12.00	5.00	10.00

Source: Karunalanka.org.

This tree has other uses also. The leaves are used to feed animals, especially goats. The yellow wood is a valuable timber and also yields a yellow dye. (Rajapakshe, 1998)

The stage of maturity at which fruits are harvested depends on the intended use. When used as a vegetable, immature fruits are picked when they are dark green. The production of a dull, hollow sound, when tapped, is considered as the most reliable indicator that the fruit is mature but not ripe. Harvesting at this stage permits fruits to be handled and distributed to distant markets, or held for longer periods before consumption. (Rajapakshe, 1998)

There are so many ways in which jak can be stored for more than a year. It is a very good substitute for rice and could be eaten in off-seasons. *Welikos eta* is a popular food item made by burying the seeds under a dry layer of sand. It can be kept for more than six months. Mature (kos) and ripe (waraka) segments are canned and stored for a long time. (Rajapakshe, 1998)

According to numerous uses of each and every part of the jak tree, people have to be aware of the value of the tree. This tree which is perfectly dubbed as 'rice tree', is a good solution to food sustainability as the season prolongs for about six months and no money is needed for the preserving techniques; only traditional methods have to be followed, for preserving it for another six months.

The study paid great attention to find out the current consumption pattern, how often the people consumed and the ways of consuming jak. It also paid attention to search how the people used preservation techniques and reasons for their responses.

Table 5.10: The Frequency of Consumption of Jak (%) within a Month in the Season

Study Location	Less than 5 days %	Less than 10 days %	Less than 15 days %
Hatamuna	10	40	30
Manewa	26	39	24
Wattegama	39	28	26
Kelegama	44	35	17
Malabe	30	30	10
Vauxhall Street	89	06	-
Illawathura	71	18	05
Ruwaneliya	85	15	07

Source: HARTI Survey data 2008/2009

Regular consumption of jak could still be observed in the study locations which are considered as producing areas. Considering less than 15 days per month in a season, the consumption is higher in Hatamuna by 30 percent throughout these 4 locations. It is

followed by Wattegama 26%, Manewa 24% and Kalegama by 17%. Considering the entire sample for less than 10 days, it is almost similar in Hatamuna and Manewa by 39 and 40 percents, followed by Kelegama 35 percent and Wattegama 28 percent. As Malabe is populated with immigrated people and most of them have limited residential land area. There is no enough space to grow this huge tree. Blocking lands for sale also has resulted in the decrease in the number of jak trees in the area. Hence they are forced to depend on the market.

The markets and fairs in suburb areas are full of processed jakfruit segments and seeds, and cut pieces of 'polos'. The people who have financial strength can depend on the market.

Illawathura, Ruwaneliya and Vauxhall Street people mostly depend on the market. Hence their consumption is lower and belong to the low frequency group of less than 5 days group (as above Table). The problem of labour for plucking, necessity of long period for processing activities, lack of time for preparation are main reasons in the reduction of the frequency of consumption.

Table 5.11: The Way of Consuming Jak

Study Location	As a main meal %	As a part of a main meal %	Occasionally in both ways %
Hatamuna	08	90	02
Manewa	04	94	02
Wattegama	16	65	19
Kalegama	02	76	22
Malabe	10	83	07
Vauxhall Street	03	91	06
Illawathura	-	100	-
Ruwaneliya	16	82	02

Source: HARTI Survey data 2008/2009

Consumption of jak as a main meal is rarely seen in all the study locations. Eating it as a curry in a main meal is popular. Kalegama and Wattegama people than in the other locations eat jak occasionally in both ways. Illawathura households have no preference at all, for jak as a main meal.

Table 5.12: Trends in Making Processed Foods from Jak

Study Location	Yes	No
Hatamuna	12	88
Manewa	26	74
Wattegama	04	96
Kelegama	10	90
Malabe	14	86
Vauxhall Street	-	100
Illawathura	-	100
Ruwaneliya	-	100

Source: HARTI Survey data 2008/2009

The trend of processing foods out of jak was very popular in ancient Sri Lanka. But due to many circumstances, that trend has disappeared. To process foods, there should be a surplus with the households, should have the know-how and needs enough time to involve in the activity. The survey has found out, the main reason common for all is not owing a surplus with them. This reason is predominant in Ruwaneliya, Illawathura and Vauxhall Street.

Table 5.13: Types of Processed Foods from Jak

Study Location	Sun dried Jak seeds %	Jak seeds kept buried in a dry sand layer %	Boiled/Dried Jak seeds %	Dried Jak segments %
Hatamuna	17	17	50	17
Manewa	-	58	-	75
Wattegama	50	50	-	100
Kelegama	-	60	-	40
Malabe	25	75	-	-
Vauxhall Street	-	-	-	-
Illawathura	-	-	-	-
Ruwaneliya	-	-	-	-

*Percentages are based on respondents

Source: HARTI Survey data 2008/2009

Table 5.14: Reasons for Not Producing Processed Foods out of Jak

Study Location	Hata-muna	Man-ewa	Watte-gama	Kelegama	Mal-abe	Vaux - hall street	Illawat -hura	Ruwan-eliya
1. No technical knowledge	18	9	40	4	13	7	-	-
2. No adequate family labour	11	6	6	2	8	7	-	-
3. No "dumessa"	-	-	-	-	8	-	-	-
4. No preference of family members	9	40	13	18	4	10	-	-
5. Easy availability of other foods	-	9	-	-	4	-	-	-
6. Lack of interest	7	3	6	2	13	3	-	-
7. No ownership	39	23	23	67	25	68	96	97
8. Having purchasing facilities	-	6	-	2	8	-	-	-
8. Distruction by insects when storing	5	-	-	-	-	-	-	-

Source: HARTI Survey data 2008/2009

5.2.2 Consumption of Breadfruit, Manioc & Yams

The edible parts of manioc plant are the roots and young leaves. Mature roots can be prepared in various ways. It is either boiled and eaten or cooked as a curry. Boiled tubers are sliced into chips and sun-dried. They can be used during food scarcity. Young leaves are used as a green vegetable (Rajapakshe, 1998).

Pounded leaves can be used as a medicine by applying to the head in fevers and headaches. Starch from tuber is used to treat rashes of children (Pauda etal, 1987).

It is not advisable to store harvested manioc for more than 24 hours. As such, the harvest should not be stored and only quantities immediately required should be uprooted when needed.

Table 5.15: The Frequency of Consumption of Breadfruit, Manioc and Yams

Study Location	Less than 5 days %			Less than 10 days %			Less than 15 days %		
	Bread Fruit	Manioc	Yams	Bread Fruit	Manioc	Yams	Bread Fruit	Manioc	Yams
Hatamuna	48	73	94	35	18	6	10	8	-
Manewa	78	68	86	23	25	10	-	8	-
Wattegama	100	38	77	-	38	23	-	17	-
Kelegama	78	59	100	19	28	-	3	9	-
Malabe	65	56	69	22	44	23	9	-	-
Vauxhall Street	100	90	100	-	10	-	-	-	-
Illawathura	93	89	88	7	7	13	-	-	-
Ruwaneliya	98	84	100	3	16	-	-	-	-

Source: HARTI Survey data 2008/2009

Table 5.16: The Way of Consuming Breadfruit and Yams

Study Location	As a main meal %	As a part of a main meal %	Occasionally in both ways %
Hatamuna	8	90	2
Manewa	4	94	2
Wattegama	16	65	19
Kelegama	2	76	22
Malabe	10	83	7
Vauxhall Street	3	91	6
Illawathura	-	100	-
Ruwaneliya	16	82	2

Source: HARTI Survey data 2008/2009

It is common that in all the study locations, people prefer to eat breadfruit, and yams as part of a main meal. In Illawathura, they preferred it as a curry and not as a main meal. Sweet potatoes, manioc, kiriala (Giant Taro), Raja ala, Rata ala, Kirikondol (Greater yam, Water yam, Winged yam and Asiatic yam) are the popular yams in these locations.

Dried bread-fruit processing could not be seen in the study locations except in Hatamuna due to non availability of a surplus. It is only 17% that was involved in processing dried bread-fruit.

CHAPTER SIX

Food Consumption Patterns and Nutritional Status

6.1 Food Consumption Pattern at Household Level

Food consumption and nutrient intake patterns from randomly selected households from 7 districts (8 DS division) were evaluated. Food intake was assessed using 7 day diet-diary method.

Foods were categorized into different food groups as per Food Composition Tables (FCT) for Sri Lanka. Each foodstuff consumed in the household during the week was calculated. Then the amount of consumption of each food as well as food groups per day per person for different cluster was quantified.

The total calorie value and the nutrients supplied by the foods are obtained using FCTs and then by summation of the value for each food items and per capita consumption per day were estimated. The nutrient adequacy of the diet was assessed by using recommended dietary allowances in Sri Lanka.

6.1.1 Food Habits

Research in recent years has shown the effects of rapid economic changes on traditional dietary patterns. When income rises, purchasing power will increase as a result. Whether this change immediately affects the food purchasing pattern depends on the capacity of the market to provide a variety of food, processed or semi-processed products. People are interested in purchasing them at higher prices, replacing traditional food from their diets without comparing whether it is better than one it is replacing.

The majority of those surveyed consumed traditional main meals on an average of 3 a day.

Snacking was not a common practice (snacks consumed generally did not contain high sugar or fat compared to what is usually found in urban settings).

6.1.2 Food Intake (commodity wise)

The factors affecting food consumption patterns are the changes in social environment which determines the dietary pattern and changes in food supply – agriculture, fishing and status of food processing and supply. Even though, food availability and availability

of nutrients at national level were satisfactory, the consumption has not shown an improvement at every household as expected.

6.1.3 Rice Consumption Pattern

Despite the diversity of the population, rice is the most important food item in the diet of the population studied, except in the Hunupitya Divisional secretariat area in Colombo, which often substituted rice with wheat products like bread (Table 6.1). It is noteworthy that nearly 40% of the diet of urban households in Hunupitiya, Colombo comprise of vegetables and fruits. The consumption of cereal foods (230.6 g) was less than the total amount of vegetables (332.8 g). People at Monaragala consumed the highest quantity of rice (457.8 g) and Kurunegala was the second highest (387.8 g). Consumption of wheat and wheat products varied in different areas and the highest consumption was recorded in Nuwara Eliya (246.7 g) may be due to subsidized supply at estate cooperative shops, the lowest was at Monaragala (29.7g).

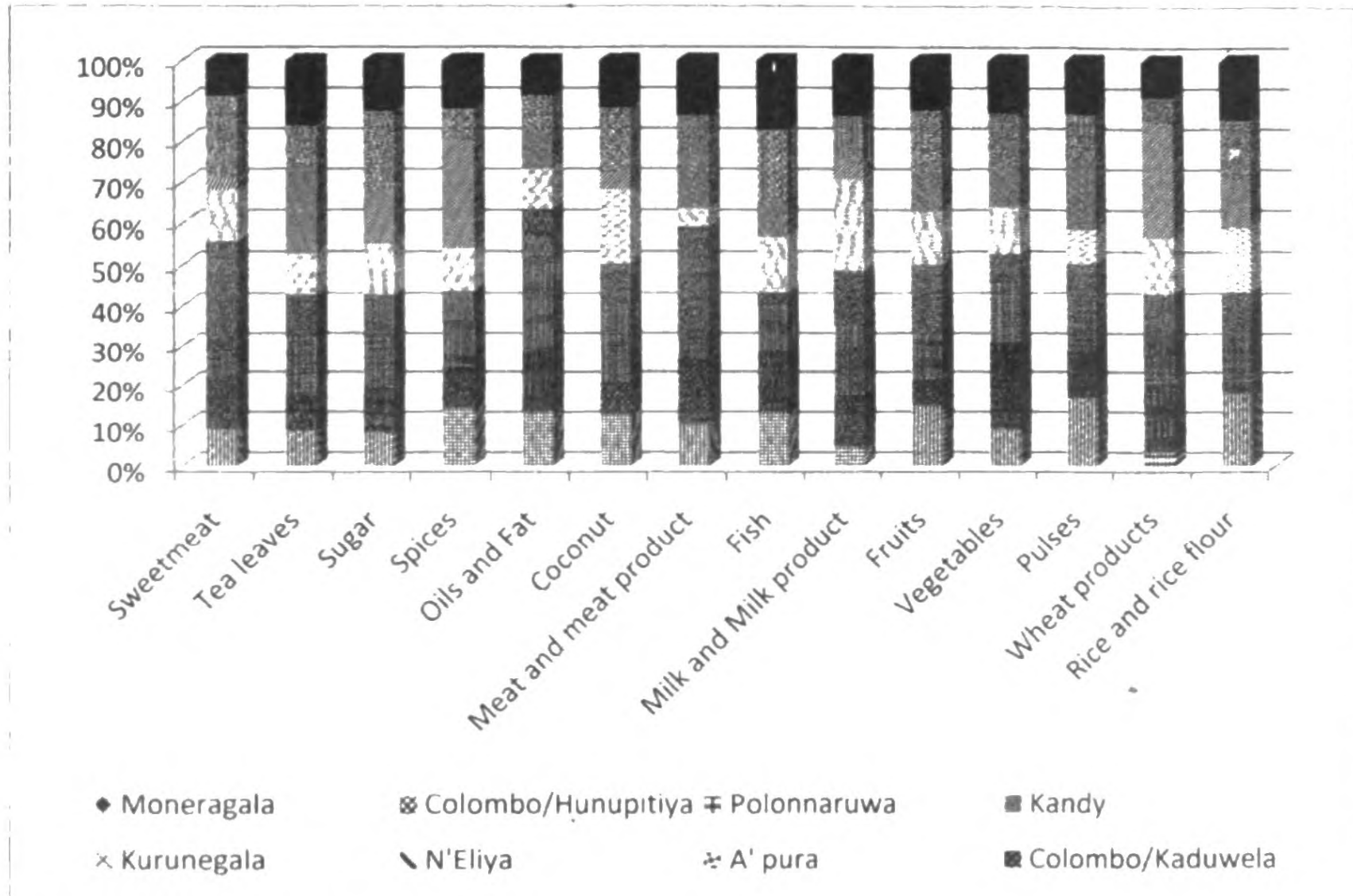
Table 6.1: The Variation of Food Consumption Pattern in Different Districts

Community Group	Study Location	Rice & Rice Flour	Wheat products	Coconut	Pulses	Vegetables	Meat & poultry	Fish	Oils and Fat	Sugar	Fruits
Paddy farming communities under major irrigation	Hatamuna, Polonnaruwa	351.8	62.1	149.7	33.9	223.4	13.5	33.2	23.6	26.8	99.9
Paddy farming communities under major irrigation	Manewa, Anuradhapura	359.2	56.3	121.9	27.9	205.4	19	50.2	9.2	40.2	132.3
Paddy farming communities under rainfed	Kalegama, Kurunegala	387.7	119.5	134.6	20	167.9	12.7	37.5	9.9	24.4	109.8
Chena Farmers	Wattegma, Monaragala	457.8	29.7	96.2	42.4	188.8	29.7	38.6	18.4	17	131.4
Semi-urban middle income dwellers	Malabe, Colombo	363.6	73.8	87.8	32.1	193.7	38	49.2	8.6	25.1	106.6
Estate Tamil Community	Ruwaneliya, Nuwaraeliya	305.1	246.7	30.1	43.1	143.8	45.7	26	9	26	85.9
Lower Income urban dwellers in Shanties	Hunupitiya, Colombo	76.6	154	62.4	29.7	332.8	46.6	45.2	15.6	22.9	59.3
Muslim Communities	Illawathura, Kandy	211.1	135.4	74.6	19.9	103	78	9.1	11.5	20.9	151
Sri Lanka	grams/day	314.11	109.69	94.66	31.13	194.85	35.40	36.13	13.23	25.41	109.53
	Kg/year	114.65	40.04	34.55	11.36	71.12	12.92	13.19	4.83	9.28	39.98

Source: HARTI Survey data 2008/2009

6.1.4 Consumption of Other Foods

Figure 6.1 illustrates the variation in food intake in the different communities of Sri Lanka.



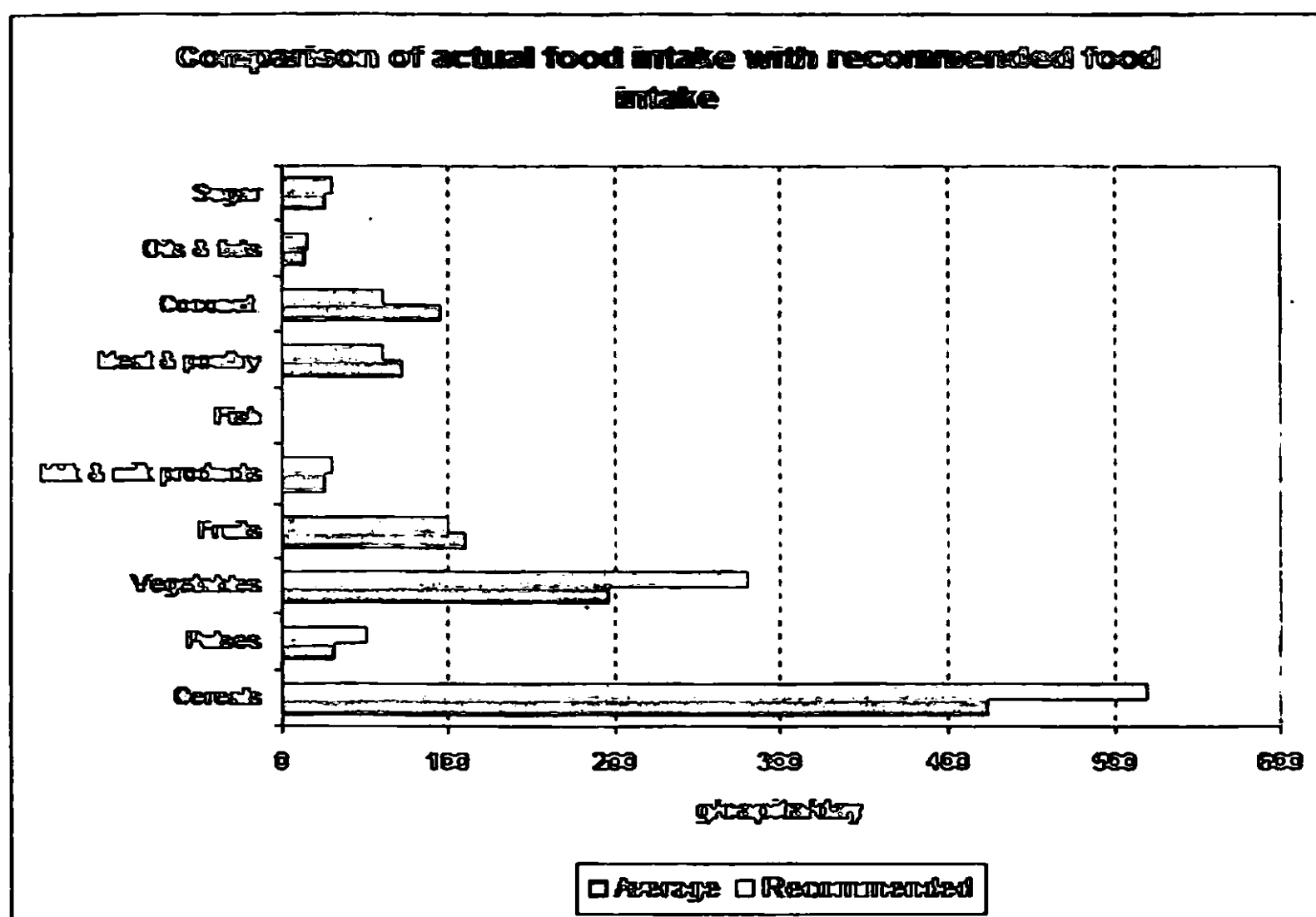
Source: HARTI Survey data 2008/2009 ..

Figure 6.1: Food Intake in Districts (g/capita/ day)

It is difficult to explain the very low intake of cereal products (rice and wheat) in the urban setting of Hunupitiya, compared to high intake of vegetables. Probably they may not have reported some cooked cereal foods purchased from the market like string hoppers, pittu and rotti.

The lowest milk intake was reported from Nuwara Eliya (7.7 g) and Monaragala (9.5 g). Even though the people from Hunupitiya- Colombo consumed the highest quantity of vegetables, intake of fruits was at the lowest (59g). Sugar intake was highest in Anuradhapura.

Figure 6.2 – Shows the comparison of actual food intake with recommended food intake for a moderately active adult in Sri Lanka.



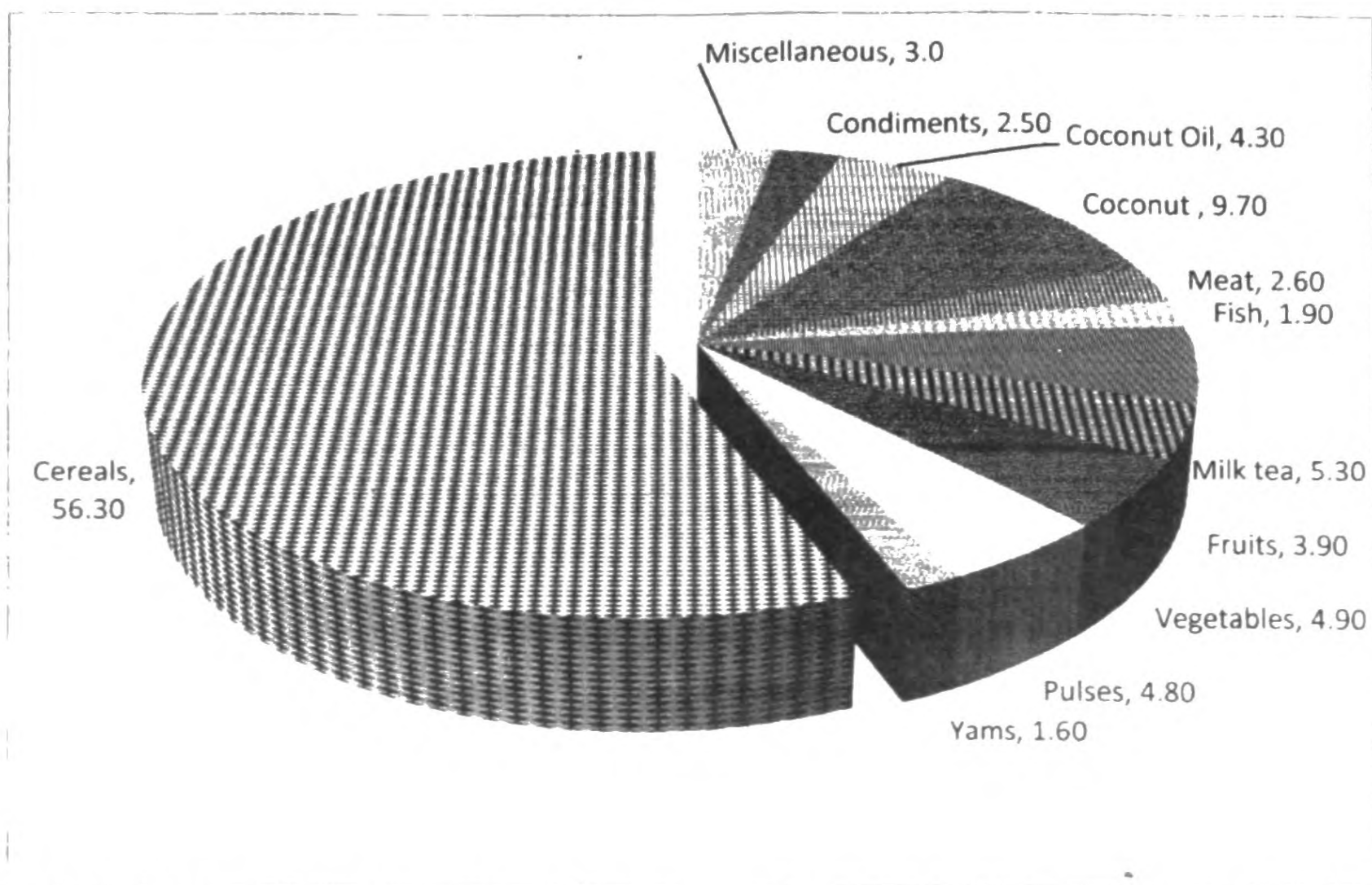
Source: HARTI Survey data 2008/2009

Figure 6.2: Comparison of Actual Food Intake with Recommended Food Intake

The average intake of cereals and vegetables reported in this study was lower than the recommended amount for Sri Lanka while consumption of coconuts was higher than the recommendation. World Health Organization (WHO) recommends minimum of 400g of fruits and vegetables per person a day to prevent micronutrient deficiencies as well as to prevent non communicable diseases.

6.1.5 Nutrient Intake

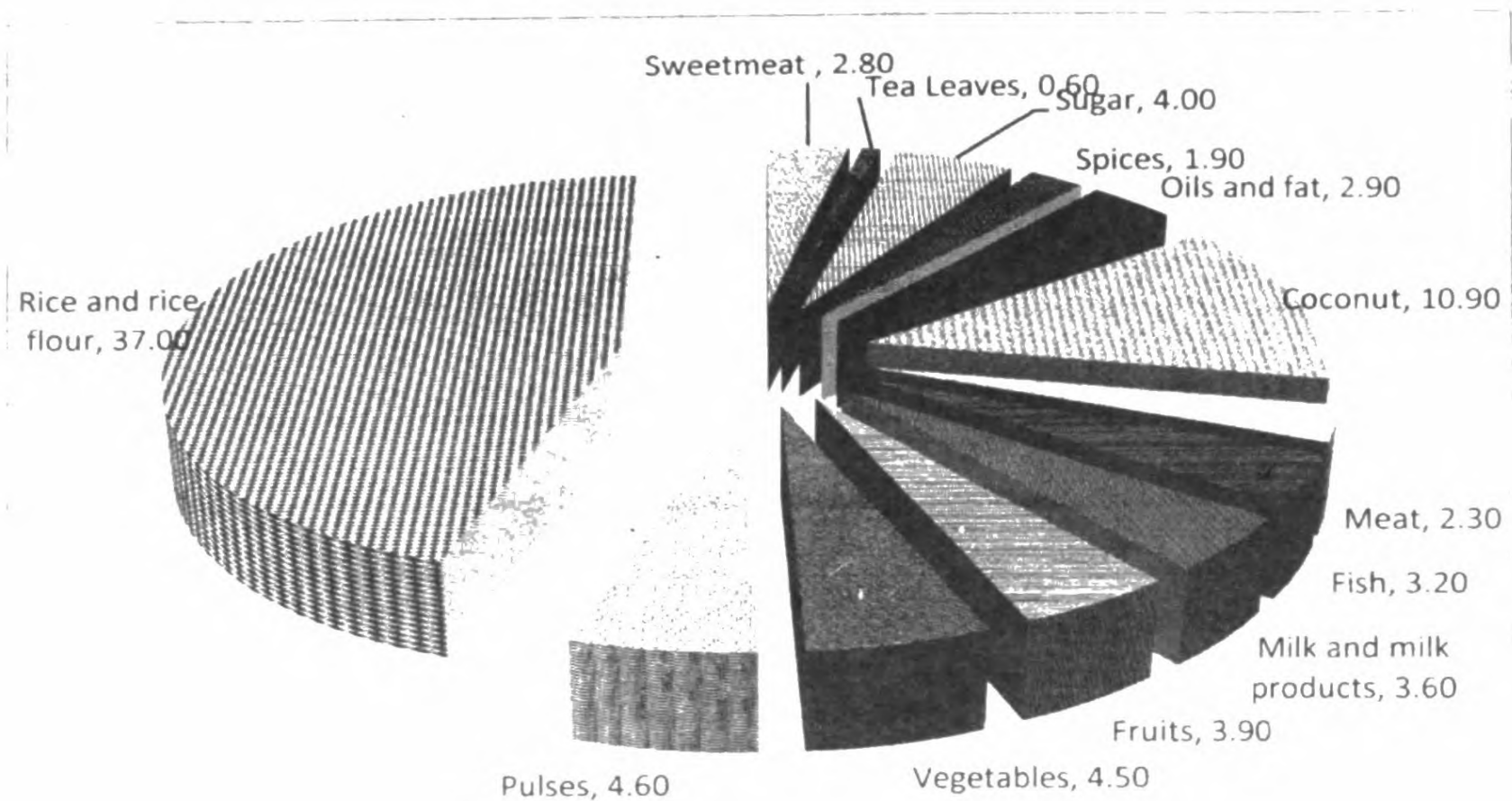
The source of major nutrients energy, protein and fat as estimated according to the diet of various groups are given below.



Source: HARTI Survey data 2008/2009

**Figure 6.3: Food Intake by Nutrients – Dietary Energy
Rural – Siyambalanduwa**

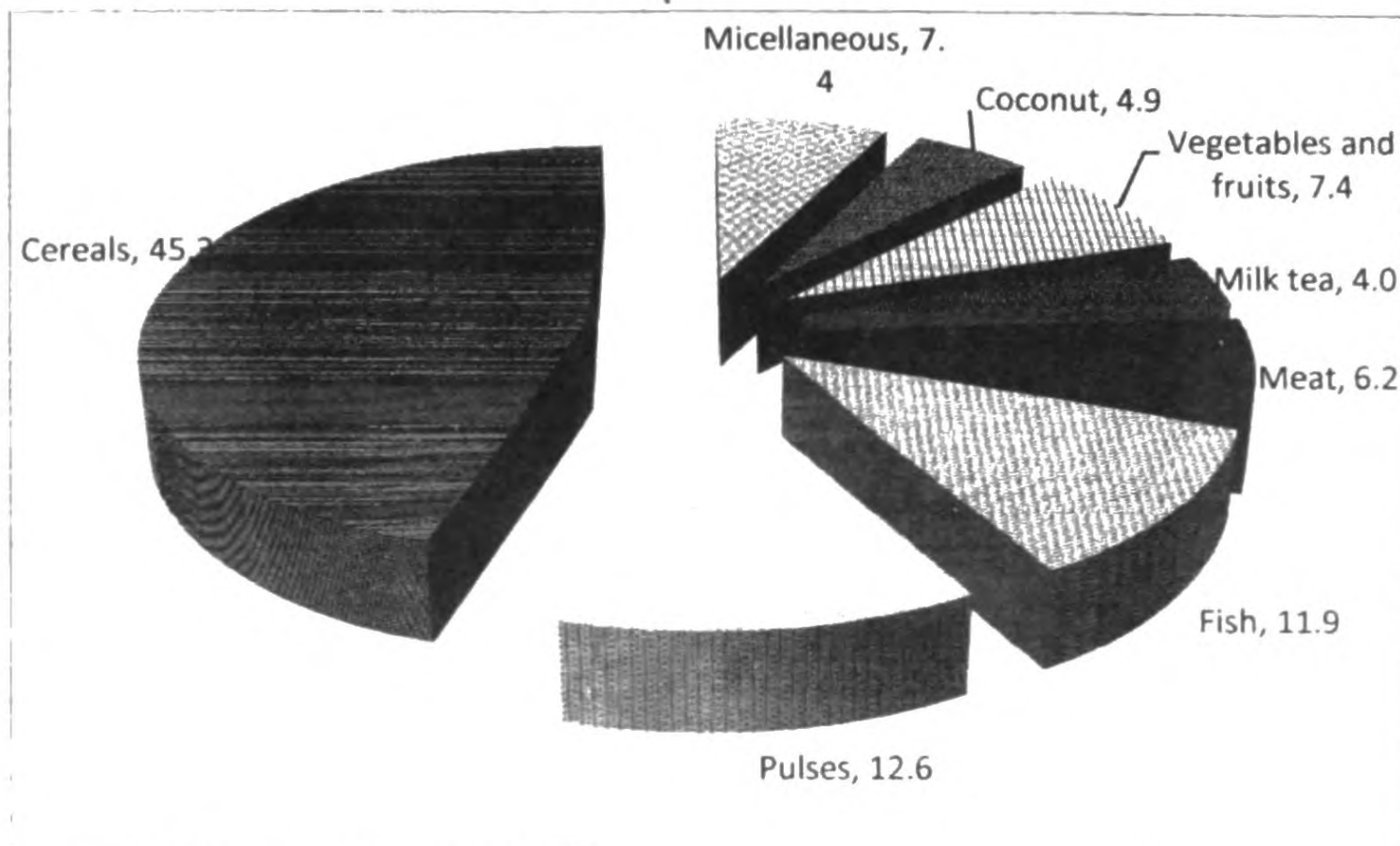
The main source of energy in majority of households was cereals; 56.2% of energy was derived from cereals in Monaragala where 50.7% was supplied by rice; coconut and coconut oil was the next major source (14%). The energy contribution from animal source was 9.8% (meat, fish and milk).



Source: HARTI Survey data 2008/2009

Figure 6.4: Sources of Dietary Energy (%) – Urban – Kaduwela

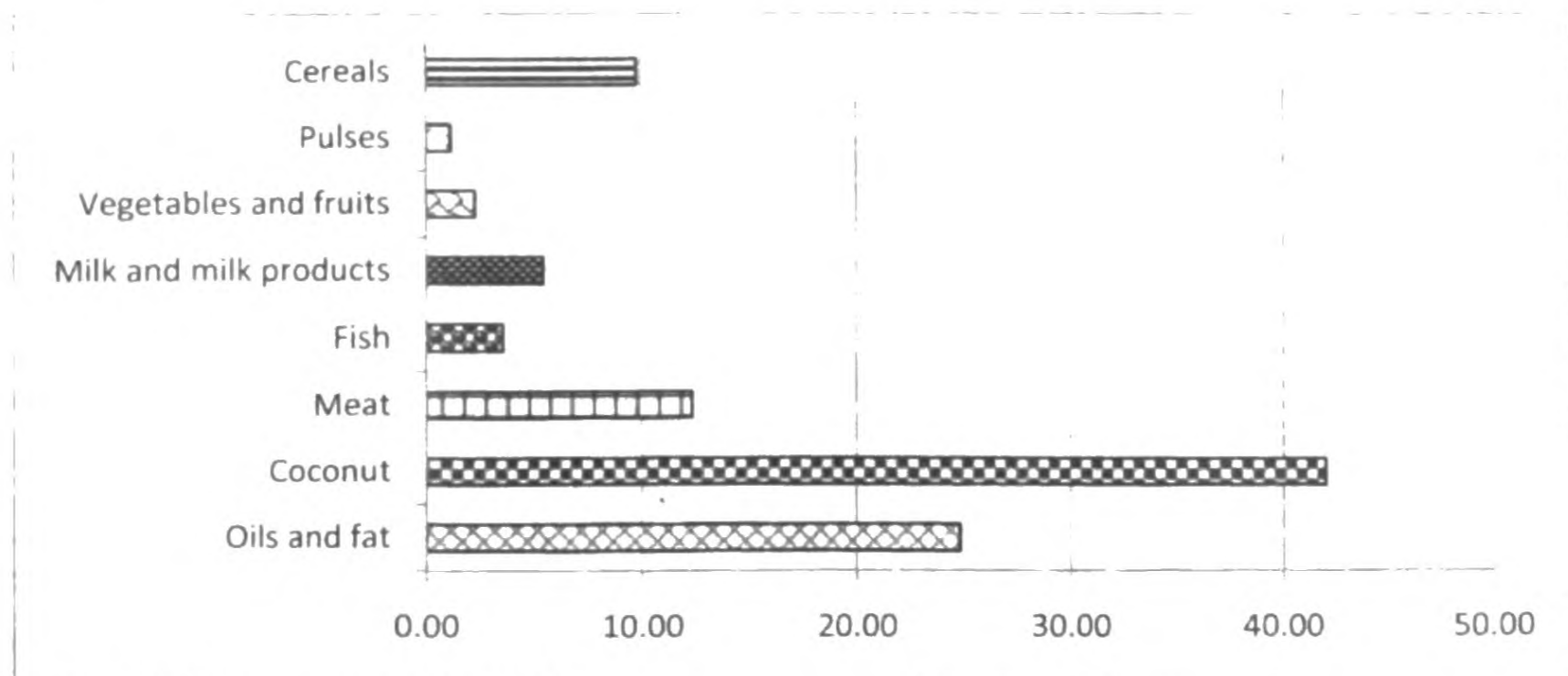
In urban areas people have changed their habits to consume more processed products, but in rural areas such change is very slow. According to changing food consumption pattern in urban Kaduwela, the major contribution was from rice and rice based food products (figure 6.4), but the portions of other sources of energy are different.



Source: HARTI Survey data 2008/2009

**Figure 6.5: Food Sources of Proteins
Rural Monaragala**

Figure 6.5 shows the food sources of protein in the diet of Monaragala community. Those households were able to obtain major portion of protein from cereal group (45.3%) and 12.6% from pulses. Meat and fish provided 18.1% where the intake of meat was 30g and fish was 39g in the households of Monaragala. The communities at Kaduwela have consumed 8 to 10g more meat and fish compared to Monaragala.



Source: HARTI Survey data 2008/2009

Figure 6.6: Food Sources of Fat

Figure 6.6 depicts the source and distribution of fat in the Sri Lankan diet where coconut is the major contributor (42%) of fats in the diet.

6.1.6 Energy and Nutrient Intake According to Diet Diary

The energy and nutrient mean intakes, calculated from the 7 day quantitative diet diary are shown in Table 6.2.

Table 6.2 : Per capita intake of Nutrients (Mean \pm SD)

	Energy Kcal	Prot ein G	Fat G	Carbo G	Calcium mg	Phospo mg	Iron mg	Vita A	Thiam mg	Ribofl mg	Niacin mg	Vita C mg
Monaragala	3286 (1136)	78 (24)	75 (46)	569 (161)	820 (476)	1502 (476)	21.6 (8.3)	965 (896)	1.1 (0.3)	1.1 (0.4)	16.7 (4.3)	130.1 (65.7)
Colombo -	2425. (632)	77 (28)	63 (24)	386 (118)	695 (385)	1357 (478)	22.4 (7.8)	513 (212)	1.2 (0.5)	1.0 (0.4)	16.1 (5.1)	112.2 (62.7)
Kandy	2507 (371)	66 (13)	71 (19)	399 (68)	682 (388)	1074 (241)	16.9 (4.3)	634 (304)	1.1 (0.3)	1.3 (0.4)	13.4 (4.2)	75.3 (36.8)
Polonn- aruwa	2975 (896)	76 (16)	89 (34)	476 (161)	749 (213)	1713 (364)	25.9 (7.5)	618 (293)	3.0 (4.8)	2.2 (2.7)	18.9 (5.2)	119.4 (53.1)
Anuradha -pura	3003 (849)	83 (28)	76 (44)	500 (109)	819 (360)	1654 (535)	27.9 (8.3)	671 (369)	1.5 (0.5)	1.3 (0.4)	19.3 (5.7)	161.0 (104.7)
Kurunegala	2975 (1519)	76 (37)	73 (32)	508 (284)	662 (274)	1635 (793)	23.8 (12.1)	538 (288)	2.8 (5.2)	2.0 (3.3)	19.1 (10.7)	144.9 (101.6)
Nuwara Eliya	3062 (1353)	92 (37)	63 (28)	529 (248)	570 (148)	1685 (689)	27.9 (10.1)	541 (179)	1.8 (0.6)	1.3 (0.4)	23.5 (7.3)	90.1 (34.6)
Kaduwela	2508 (354)	75 (16)	54 (17)	430 (53)	686 (172)	1263 (171)	20.4 (4.1)	667 (173)	1.2 (0.3)	1.1 (0.5)	16.8 (4.8)	112.8 (40.1)
Total sample	2862 (996)	78 (26)	71 (33)	479 (175)	714 (312)	1511 (532)	23.7 (8.6)	645 (417)	1.8 (2.6)	1.4 (1.6)	18.2 (6.6)	121.5 (70.6)

Source: HARTI Survey data 2008/2009

The Districts of Monaragala (3286 ± 1136 kcal), Anuradhapura (3003 ± 849 kcal) and Polonnaruwa (2975 ± 896 kcal) had the highest intake of energy while the average energy intake was 2862 ± 996 kcal. The mean intakes of nutrients such as calcium, iron and vitamin A were less than the RDA for Sri Lanka in majority of households in all districts showing inadequate diversity in their habitual diets.

Adequacy of the diet was assessed using RDA for Sri Lanka and illustrated in Table 6.3.

Table 6.3: Percentage of Population with less than Recommended Nutrient Intake in Different Districts

	Net Energy	Protein	Calcium	Iron	Vitamin A	Thiamin	Ribofl	Niacin	Vita C
Monaragala	10.0	10.0	50.0	60.0	30.0	30.0	40.0	10.0	10.0
Colombo -	10.0	0.0	60.0	50.0	40.0	20.0	40.0	10.0	10.0
Kandy	0.0	0.0	80.0	80.0	40.0	20.0	0.0	40.0	20.0
Polonnaruwa	10.0	0.0	30.0	20.0	11.1	0.0	10.0	0.0	0.0
Anuradhapura	0.0	0.0	20.0	20.0	30.0	10.0	10.0	10.0	0.0
Kurunegala	0.0	0.0	50.0	50.0	22.2	10.0	20.0	10.0	0.0
Nuwara Eliya	30.0	0.0	70.0	20.0	30.0	0.0	20.0	0.0	0.0
Kaduwela	20.0	0.0	50.0	50.0	10.0	20.0	30.0	10.0	0.0
Total sample	10.7	1.3	49.3	41.3	26.0	13.3	22.7	9.3	4.0

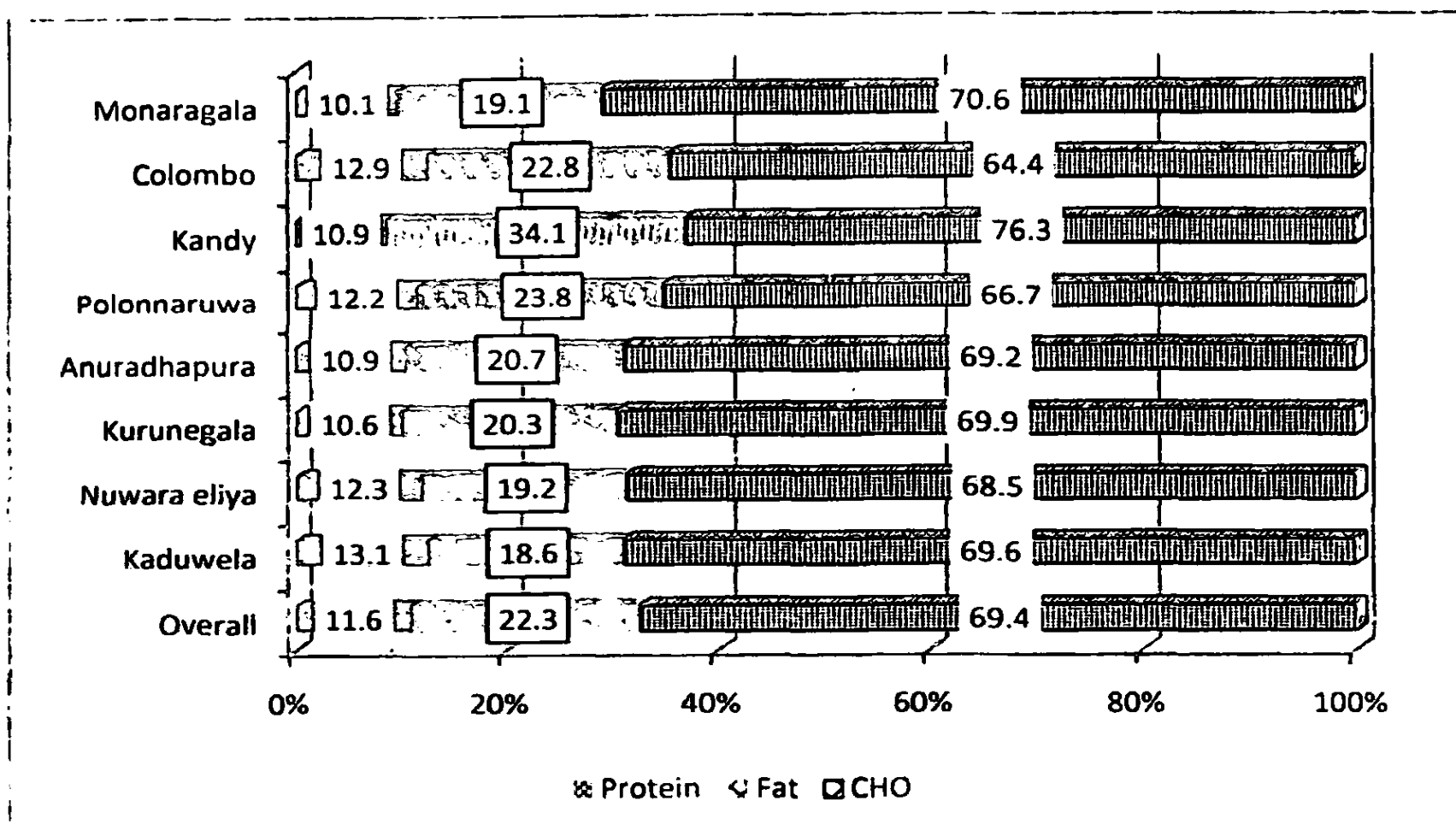
Source: HARTI Survey data 2008/2009

It is worthy to note that overall 10% of the household population had inadequate intake of energy although 30% in the Nuwara Eliya district had below the recommended intake. Per capita energy intake at Nuwara Eliya was 3062+₋1353 kcal. The remarkable variation in intake may explain the 30% of population getting less than the recommended. Availability of dietary energy or the energy intake per capita per day is a key variable used for measuring and evaluating the food situation in a particular area or the country.

Inadequacy of calcium intake was the worst in Kandy (80%) where there was variable intake at certain households. In the Nuwara Eliya district calcium intake was low 570+₋140 mg giving 70% of households having inadequate intake. Overall inadequacy of calcium was 49% of the study population. It is noteworthy that the diet of 80% households studied in Kandy had a very low iron content as well. Vitamin A inadequacy in the diet was 40% in Kandy and Colombo districts. Even though there was a satisfactory overall food intake to obtain adequate amount of energy, poor diversity of the diet in certain districts was more noticeable due to inadequate contribution to meet essential micronutrients.

6.1.7 Dietary Energy Supply

Figure 6.7 shows how the macronutrients – Carbohydrates, fat and protein contribute to the dietary energy supply.



Source: HARTI Survey data 2008/2009

Figure 6.7: Dietary Energy Supply in Different Districts

The main source of energy was carbohydrate in almost all the diets. Overall contributions from different macronutrients were 69.4%. Energy was from carbohydrate while fat provided 22.3% and 11.5% was received from protein in the diet. Dietary energy supply was very satisfactory and well within the WHO recommendations for a healthy diet targeting to prevent diet related chronic diseases. However the Kandy district was an exception where people obtained more than 30% of energy from fat.

6.2 Nutritional Status of Children

6.2.1 Data Analysis and Indicators

The WHO ANTHRO 2005 which was developed for global application of the WHO growth standards in monitoring growth and development in individuals and population was used to determine weight-for-height/ length, height/ length-for-age and weight-for-age indicators of the preschool children in the study population. The prevalence of under nutrition was estimated by identifying undernourished individuals (stunting, wasting, underweight) using cut-off points of $-2Z$ score and $-3Z$ scores according to the recommendations made by WHO (2005).

6.2.2 Stunting (Height- for age)

The height for age index presented in Table 6.4 provides an indicator of linear growth retardation among children. Children who are less than two standard deviations below the median of the WHO standard population in terms of height for age may be considered short for their age ("stunted") or chronically malnourished. Severe linear growth retardation ("stunting") reflects the outcome of a failure to receive adequate nutrition over a number of years and is also affected by recurrent and chronic illness. Height for age, therefore, represents a measure of the long term effects of malnutrition in a population and does not vary appreciably according to the season of data collection.

6.2.3 Wasting (Weight-for-height)

The weight for height index looks at body mass in relation to body length. Children who are less than two standard deviations below the median of the reference population in terms of their weight for height may be considered too thin ("wasted"), i.e., acutely malnourished. Wasting represents the failure to receive adequate nutrition in the period immediately before the survey and may be the result of recent illness episodes, especially diarrhoea, or of seasonal variations in food supply.

6.2.4 Underweight (Weight-for-age)

Weight for age takes into account both chronic and acute malnutrition and is often used to monitor nutritional status on a longitudinal basis. It is useful for comparison with the results of studies or clinic based growth monitoring efforts that employ the weight for age measure. Similar to weight for height, this index is subject to seasonal variation.

Table 6.4 shows the prevalence of under nutrition among the children below five years of the study population comparing with the latest national survey findings (DHS 2007).

Table 6.4: Prevalence of Stunting, Wasting and Underweight of Preschool Children

Nutritional Deficiency	HARTI 2008		DHS 2007		Mean	SD
	<-2SD	<-3SD	<-2SD	<-3SD		
Stunting	18.8	3.1	17.3	3.9	-0.19	1.98
Wasting	12.9	0	14.7	2.8	-0.97	0.94
Underweight	15.2	6.1	21.1	3.7	-1.01	1.34
BMI	12.9	3.2				

(Values are based on WHO standards)

Source: HARTI Survey data 2008/2009

The prevalence of stunting, wasting and underweight was 21.9%, 12.9% and 21.3% respectively for the children who were in the respective households of the survey.

Comparing these prevalence rates of the same age children in the latest Demographic Health Survey (2007) (stunting, wasting and underweight were 21.2%, 17.5% and 24.8% correspondingly), the prevalence rates found in the present study are lower for wasting and underweight than the prevalence rates observed all island in 2007 (Table 6.4), probably indicating an improved nutritional status during the survey period.

6.2.5 Body Mass Index (BMI)

Table 6.5 highlights the mean height, weight and the BMI for the three age groups; under five years, 5 -10 years, 10 – 18 years and the age > 18 years population.

Table 6.5: Mean Height, Weight and Body Mass Index by Age Groups

Age Groups	Age-years		Height- cms		Weight – Kg.		Body Mass Index	
	Mean	Std Devia tion	Mean	Std Deviation	Mean	Std Deviat ion	Mean	Std Deviation
Under 5 years	3	2	92.6	16.5	12.4	4.3	14.04	2.03
5-10 years	7	1	121.1	11.7	22.1	11.1	14.48	3.13
10-18 years	13	2	145.3	12.6	37.5	12.6	17.91	7.45
>18 years	41	16	156.0	14.1	53.1	12.6	21.66	4.31
Total	30	20	144.8	24.6	43.7	18.6	19.66	5.55

Source: HARTI Survey data 2008/2009

There are marked regional variations in child under-nutrition. However, this study shows that despite the substantial advances in child’s survival, child under-nutrition remains a major public health problem in the study population according to the following categorization.

Prevalence (percentage) range used by WHO to categorize the public health significance of different measures of under nutrition (< -2 SD):

Age	Height-for-age	Weight-for-height	Weight-for-
	(Stunted)	(Wasted)	(Underweight)
Low	<20	<5	<10
Medium	20-29	5-9	10-19
High	30-39	10-14	20-29
Very High	40+	15+	30+

6.2.6 Nutrition Profile of Young Children and Adults

Body Mass Index (BMI) was calculated as weight in kilogram divided by height in metres squared (kge/m^2). As measure of relative weight, it is an acceptable proxy for thinness and fatness and has been directly related to health risks in many populations. The age appropriate cut-off levels of BMI was used to categorize the nutritional status of children 5 to 18 years while adults who were below the 18.5 of BMI were considered as underweight and who were above 24.9 of BMI were considered as overweight (WHO, 1995). Table 6.6 shows the percentage of children and adults who were undernourished according to specific BMI cut-offs and also the prevalence of overweight and obesity.

Table 6.6: Nutritional Status

National Status (Body Mass Index) of Children and Adults						
Age Groups	Body Mass Index	National Status				Total
		Thinness	Normal	Overweight	Obese	
		%	%	%	%	
5-10 years	14.48	18.5	74.1		7.4	27
10-18 years	17.91	13.2	84.9		1.9	53
>18 years	21.66	20.4	61.6	14.2	3.8	211
Gender- Male	19.88	15.4	72.6	9.4	2.6	117
- Female	20.60	21.3	63.2	10.9	4.6	174
Total	20.31	18.9	67.0	10.3	3.8	291

Source: HARTI Survey data 2008/2009

The mean body mass index of adult population was 21.6 with 19.9 for males and 20.6 for females. There were 20.4% who were undernourished while 14.2% and 3.8% of the adult population were overweight and obese respectively. There were no overweight children aged 5-18 years but there were obese children (7.4%) in the 5-10 years age group and 10-18 years (1.9%).

In summary, this study reveals that majority of those surveyed population consumed traditional main meals average of 3 a day. Rice was the staple food of most of the households. Snacking was not a common practice in rural areas.

Food consumption has not shown an improvement at every household as expected. Usual practice of high consumption of wheat based foods was seen among estate population may be due to availability of subsidized wheat flour at estate cooperatives. This is an area which needs policy decisions to distribute rice flour and rice based food products to these estate cooperatives.

The average intake of cereal foods and fruits was low in their habitual diet. It is noteworthy that 10% of the households in most of the districts had less than the recommended energy intake. The poor dietary diversity may have resulted in low intake of nutrients such as calcium, iron and vitamin A. The calcium inadequacy (<RDA for Sri Lanka) was 49% and iron intake was less than the RDA in 41% of the population in these study locations. It is required to consume minimum of 400g of fruits and vegetables per day to prevent nutritional deficiencies.

Although the nutritional status of children seems to be improving, especially wasting and underweight at the time of the study, to observe the improvement of overall nutrition, it is required to strengthen the nutrition intervention programs in the area. Availability of fruits and vegetables for every household at an affordable price is very important. Special attention should be paid to appropriate programs like "Gamidiriya" and evaluation and monitoring of these activities must be linked with all the phases to strengthen the program to achieve the objectives.

CHAPTER SEVEN

Findings and Recommendations

Diets evolve over time, influenced by many factors and complex interactions. Income, prices, individual preferences and beliefs, ethnic and cultural traditions, as well as geographical, environmental, social, and economic factors all interact in a complex manner to shape dietary consumption patterns.

Rice is the main food of an average Sri Lankan. Nevertheless, wheat provides 1/4th of his cereal calorie requirement. From very ancient times Sri Lanka was known as a rice consuming country in Asia and the traditional Sri Lankan diet comprised of mainly rice, finger millet (kurakkan), and yams. Several changes had taken place in the Sri Lankan diet over the years that the country had been categorized as a rice-wheat importing country in Asia in the recent history. From the 13th century onwards, our traditional self-sufficient food system started to disintegrate with the collapse of irrigation network due to Indian invasions and many other factors. Then after the European invasions our traditional diet began to change with the introduction of wheat based foods particularly among urban communities. Food shortages during the Second World War let the country depend on heavy imports of wheat mainly from Australia. There were changes occurred to immigrant ethnic groups too.

7.1 Findings

According to the annual per capita, rice consumption is 114.7 kg per person. Annual per capita of wheat consumption is 40.4 kg per person.

The annual rice consumption in paddy and Chena cultivation areas, per capita rice consumption has been high. It is between 128.40 kg to 167.1 kg per person.

The annual per capita rice consumption of estate community is 111.11kg per person.

According to consumption patterns, in the North Central Province and in the North-Western Province, the most popular rice was parboiled and raw white.

In rural low income communities, most popular rice was parboiled and long grain rice. High percentage of per capita consumption of wheat flour is recorded among the estate community. The lowest percentage of milk consumption was also seen among them.

Lowest per capita fruits consumption is recorded among the urban shanty dwellers. In the sample area, the vegetable consumption is significantly low. At the same time coconut consumption has been very high.

Among rice based industries the most popular industry was rice flour production. Based on the rice flour industry, sweets, hoppers, string hoppers, pittu and noodles productions are common.

In biscuits industries using rice flour has been started on an experimental basis.

Among the other field crops, cereals such as green gram, cowpea, maize and finger millet (kurakkan) have been consumed for a less number of days per month.

During the seasonal period of jak, jakfruit and local yams had been consumed for only less than five days per month.

Food consumption routine is totally different in urban shanties compared to other areas. Rice and bread, rice and gram, rice and string hoppers, rice and roti, rice and green gram or cowpea are popular among them.

General Consumption Pattern

In the current food consumption behavior of different communities in Sri Lanka diets are specific to the location and regionalized food consumption patterns are found.

Rice Consumption Pattern among Different Communities in Sri Lanka

Some 78% to 90% of households of the Sinhalese community, 3% to 8% small number of households of estate Tamils, Moors and Colombo shanty dwellers consumed rice for breakfast. Some 88 to 100 percent of households of Sinhalese, estate Tamils and Moor communities consumed rice for lunch. 73% to 92% of households of Sinhalese and estate Tamils community consumed rice for dinner while only 23% of the households of the Moor community consumed rice for dinner.

A high percentage of the households of Sinhalese consumed rice for three meals, while Estate Tamils and Moor community consumed rice only for two meals (lunch and dinner). A high percentage of households of Estate Tamils, Moor and few urban shanties consumed rice for breakfast. Rice is yet a common food in Sri Lanka.

Sri Lanka	grams/day	314.1	102.5
	Kg/year	114.7	37.4

Factors Determining other Food Consumption

The study concentrated on the current food consumption behaviors of traditional subsidiary food crops: tuber roots, pulses and other traditional starchy food crops.

Nutrition level and nutrition deficiencies related to their diet

The study assessed the dietary diversity and nutritional value of different food diets of the Sri Lankan communities, increased diversity of calorie source is associated with increased total calorie intake. The main source of energy and the main source of protein is cereal. Food pattern of the study area is strongly based on factors such as price of food, availability of food, convenience in preparing, employment, living area, health condition, ethnicity and the culture of the consumer.

7.2 Recommendations

- The farmers in the rain fed areas face the problem of water scarcity in cultivating paddy in *yala* season. Hence there is a need to motivate them to cultivate other field crops instead of paddy in *yala* season.
-
- The subsidiary food crops are also as important as paddy. Distributing quality seeds at low rates should be implemented to increase the quality of production. Then the present situation will change to a certain extent and the people will be compelled to eat legumes and pulses more.
- Subsidiary food crops can be cultivated for a third consecutive season.
- Popularizing the consumption of pulses and legumes by increasing the cultivation of OFC and making people aware of consuming more pulses and legumes than now are needed.
- As the vegetable and fruit consumption rate is low, it has to be increased by including more vegetables and fruit in main meals. Awareness programmes should be conducted for the masses in rural, urban and estate sectors.
- Improving the agriculture extension service to increase production and consumption of paddy and subsidiary crops according to the present socio-economic and technical scenarios is necessary.
- Strengthening homegardens under *Divi Naguma* and Department of Agriculture programmes to add more fresh vegetables and fruits into day-to-day meals for each household is a pressing need.
- Increasing the number of outlets to facilitate buying more and more rice flour based foods in the Muslim and Tamil areas to increase consumption of rice flour based food items is recommended.

- The domestic tuber roots, are rarely seen in meals in the urban, semi urban and estate areas. Many tuber roots can be easily grown at a minimum cost. Consuming tuber roots specially for breakfast is very easy and it can be promoted as a consumption pattern by conducting demonstration programmes in public and private organizations such as schools, factories and offices.
- These rare root crops can be cultivated in homegardens under the Divi Naguma programme.
- Educating the present generation (Schoolchildren and youth) about the fact that Sri Lanka is rich enough in so many nutritious foods such as jak, breadfruit which can be eaten as a meal or as a part of a meal is necessary.
- Continuing the maximum retail price of rice (ceiling price) as a national policy is suggested.

7.3 Policy Options for Designing Production, Processing and Marketing Policies to Develop the Local Food Sector for Food Security in Sri Lanka

Agriculture and food sector must be given due importance for promotion of healthy diets for individuals and community groups. Food strategies must not merely be directed at ensuring food security for all, but must also help the consumption of adequate quantities of safe and good quality foods to make up a healthy diet. To explore the potential of the food and agriculture sector to meet the demands and challenges, it is useful to examine trends in consumption patterns in different parts of the country which this report tried to find out.

Economic development should be accompanied by improvements in the country's food supply and the gradual elimination of dietary deficiencies, thus improving the overall nutritional status of the country's population. Furthermore, it should bring about qualitative changes in the production, processing, distribution and marketing of food.

Changes in diets, patterns of work and leisure - often referred to as the "nutrition transition" - are already contributing to the causal factors underlying noncommunicable diseases even in the poorest countries. Moreover, the pace of these changes seems to be rapid, especially in the low-income and middle-income countries.

The dietary changes that characterize the "nutrition transition" include both quantitative and qualitative changes in the diet. Adverse dietary changes include shifts in the structure of the diet towards a higher energy density diet with a greater role for fat and added sugars in foods, greater saturated fat intake (mostly from animal sources), reduced intakes of complex carbohydrates and dietary fibre, and reduced fruit and vegetable intakes (1). These dietary changes are compounded by lifestyle changes that

reflect reduced physical activity at work and during leisure time (2). At the same time, however, poor countries continue to face food shortages and nutrient deficiencies.

The impact that agricultural policies, particularly subsidies have on the structure of production, processing and marketing systems - and ultimately on the availability of foods that support healthy food consumption patterns - should not be overlooked.

7.4 Further Research

This research does not include geographical data from areas such as Southern, Eastern, North, Uva, Sabaragamuwa and Eastern, provinces and on primitive societies and fishing communities. Therefore, it is very important to conduct further research investigating areas which this study did not cover.

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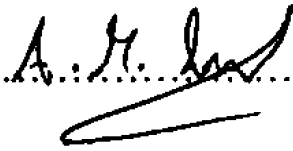
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