

# Sri Lanka - Crop Estimating Survey on Paddy (Maha) - 1998

**Department of Census and Statistics - Ministry of Finance and Planning**

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## Overview

### Identification

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**ID NUMBER**

LKA-DCS-CESPM-1998-v1.0

### Version

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**VERSION DESCRIPTION**

V1.0: Full edited dataset, original version for internal DPD Use

**PRODUCTION DATE**

2008-12-03

### Overview

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**ABSTRACT**

Crop estimating survey on paddy which is popularly known as "Crop Cutting Survey" commenced in the year 1950. It is conducted covering Maha and Yala season with a view to estimate the average yield of paddy and production by District. In a Maha season about 6,000 and in a Yala season about 4,000 experiments are being conducted for this survey and it is the only source to estimate the country's paddy production. Policy Planners are benefited by these data in numerous ways for taking the decisions such as volume of additional rice requirement of the country to be imported in time, evaluation of extension programs undertaken to uplift the average yields of paddy, pricing policies of rice, mobilization of stocks from one place to another and many more. Therefore, it is a great responsibility to estimate paddy production accurately and timely to fulfill the national requirement.

Field staff attached to each District has been entrusted with many responsibilities on various data collection activities and among them, method of data collection for crop cutting is different from the other surveys. This survey is associated with an objective approach; as such crop cutting officers should carry out experiments in the field by themselves. According to the standard procedure, the crop cutting officer must visit the selected paddy field and they should follow a number of steps such as; demarcate the specified plot of land equivalent to 16' " X 16' 1/2" (a paddy land of one perch of an acre), harvest the crop of the plot, thresh the grain, measure the grain using standard set of seers and finally report the results through the prescribed form CC3.

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Concepts, Definitions and Classifications associated with Crop Estimation of Paddy Survey

Seasons - In Sri Lanka there are two major cultivation seasons associated with two monsoons and they are known as Maha season and Yala Season.

Maha Season is the main season associated with North-east monsoons effective during September - April in the following year. When a particular crop is planted and harvested during this period is known to be Maha Crop.

Yala season is the secondary season which is associated with South-west monsoons effective during the period between May to September. When a particular crop is planted and harvested during this period is known to be Yala Crop.

#### Mode of Irrigation

There are three type of irrigations related with paddy cultivation. They are (1). Major Irrigation schemes (2). Minor Irrigation schemes (3). Rain-fed schemes.

Major Irrigation schemes defined to be an irrigated scheme of which water is fed to more than 200 acres otherwise it defines as a Minor Irrigation scheme.

Rain-fed is defined, if the cultivated extent is purely depending on rain water in absence of permanent water tank or reservoir.

Volume of Production is reported in Metric Tons.

Average Yield per acre or Hectare: An Indicator of productivity per area unit (2.471 acres = 1 hectare while 1 hectare is equal to 1,000 square meters) estimated through crop cutting survey. Average yield per acre is reported in Bushels while per hectare is reported in Kgs.

Average yield is expressed in terms of Paddy (grain with the husk form but not in Rice form)

Area Harvested refers to the gross area of which the harvest is gathered excluding the area damaged due to different causes.

Gross Area refers to the extent of which reported by enumerators or respondents based on cultivated extent estimated by seed rates but not based on cadastral surveys while Net Area refers to the extent evolved by deducting the extent set a part for bunds and ridges.

Production for a year should consider to be the sum of the production of Maha season and Yala season. For instance the production of the year 2005 is to be the sum of 2004/05 Maha season and Yala season of 2005.

#### **KIND OF DATA**

Sample survey data [ssd]

#### **UNITS OF ANALYSIS**

Paddy land Parcel 16 1/2" X 16 1/2", Where smaller experimental plot sizes are used in terraced fields.

## Scope

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#### **NOTES**

Geographical information

Paddy parcel information

System of tenure

Method of preparation of land

Variety of seed

Method of sowing

Application of Fertilizer

Weeding

Insects/Fungus control

Adverse affects on crop

Yield

#### **TOPICS**

Topic	Vocabulary	URI
agricultural, forestry and rural industry [2.1]	CESSDA	<a href="http://www.nesstar.org/rdf/common">http://www.nesstar.org/rdf/common</a>

## Coverage

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#### **GEOGRAPHIC COVERAGE**

National Coverage

#### **UNIVERSE**

The survey covered a random sample from all the paddy lands in Sri Lanka

## Producers and Sponsors

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### PRIMARY INVESTIGATOR(S)

Name	Affiliation
Department of Census and Statistics	Ministry of Finance and Planning

### FUNDING

Name	Abbreviation	Role
Government of Sri Lanka	GOSL	

## Metadata Production

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### METADATA PRODUCED BY

Name	Abbreviation	Affiliation	Role
Department of Census and Statistics	DCS	Ministry Of Finance and Planning	Conducting the survey

### DATE OF METADATA PRODUCTION

2008-12-03

### DDI DOCUMENT VERSION

Version 1.0 (2008)

### DDI DOCUMENT ID

DDI-LKA-DCS-CESP[M]-1998-v1.0

# Sampling

## Sampling Procedure

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Sampling Design: The sampling design adopted in the survey is a stratified multistage sampling method where DS Divisions were treated as strata and mode of irrigation schemes namely; Major, Minor, and Rain-fed as sub strata. Number of villages to be selected for crop cutting experiments in each scheme is decided on the basis of the following proportions.

Acreage sown in the previous corresponding season Number of villages to be selected

< 500 Acres 3

500 - <1000 Acres 5

1000 - < 5000 Acres 10

5000 - < 10,000 Acres 15

10,000 - < 15,000 Acres 20

15,000 - < 20,000 Acres 25

20,000 Acres and above 30

Though the recommended design is such, considering the sampling variances occurred during the previous seasons, the number of experimental villages to be selected is being curtailed in order to keep the number of villages within a range of 3,000 for a Maha season and 2,000 for a Yala season in a year. Other reasons for such restrictions were related to practical aspects like cost of the survey and number of personnel that could be deployed to carry out crop cuttings.

In each selected village two crop cutting experiments are conducted. At present the sample villages and the parcels are selected at random. However, prior to 1980, selection of villages as well as parcels was done at random with probability proportional to the area cultivated during the previous corresponding season with replacement. As the procedure was somewhat laborious and time consuming, it was replaced with the present system i.e. both stages at random. Sample villages are selected in the head office while the selections of parcels are done at the respective Districts.

Controlling of Non-sampling Errors: In view of the accuracy of the experimental results, a sample of 1/5 of selected villages are to be supervised by executive officers/District Heads identified from the District such as DS/GA, Divisional Secretary, Director/Deputy Director of Agriculture, Deputy Commissioners of Agrarian Development in addition to the Senior Staff of DCS attached to the District. Spot checks are to be performed by them by visiting the sample villages.

# Questionnaires

## Overview

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The questionnaire is Form C.C.3 printed in Sinhala/English and Tamil/English languages. It has three parts.

Part I is about the geographical and Paddy land parcel information.

Part II includes System of tenure, Method of preparation of land, Variety of seed, Method of sowing, Application of Fertilizer, Weeding, Insecticides, Fungicides, Adverse affects on crop.

Part III Collects yield information.

In the questionnaire the above information is recorded for two parcels selected for the survey. The same Form C.C.3 is used to collect data for both Yala and Maha seasons. Maha Season falls during "North-east monsoon" from September to April in the following year. Yala season is effective during the period from May to end of August.

## Data Collection

### Data Collection Dates

Start	End	Cycle
1997-10-01	1998-04-30	N/A

### Data Collection Mode

Face-to-face [f2f]

#### DATA COLLECTION NOTES

Crop Cutting Officers: Once the list of villages are transmitted to the Statistics Branch of the respective District, the Head of the Division Deputy Director/Senior Statistician/Statistician has to identify the crop cutting officers who are to be suitable for conducting these experiments in the selected villages. Guideline is to choose them preferably out of the field officers attached to the respective DS Divisions who are related to the discipline of agriculture such as Agricultural Officers/Agricultural Instructors of the Ministry of Agriculture, Divisional Officers of Department of Agrarian Development, Colonization Officers, etc. in addition to the Range Statistical Officers of DCS. Range Statistical Officers should undertake at least three experiments in his range. The direction is to discuss this matter in the District Agriculture Committee Meeting (DAC) held once in a month chaired by District Secretary/Government Agent and then assign the villages in concurrence with the DS/GA

The Statistical officer (SO) or the Agriculture Instructor (AI) in the area visits the selected paddy land along with the farmer and cuts the crop in the demarcated area. The crop is measured in Seers then and there and the yield is recorded. Then in the same way yield for the other parcel is recorded. The crop collected for measuring is returned to the farmer. In addition to the yield recorded in this manner, other relevant information requested in the form C.C.3 has to be collected .

Ancillary Information: When crop cuttings are done in the field, in addition to sample fields selected for crop cuttings, an extra set of sample (four parcels) fields are selected to collect ancillary information related to the paddy crop viz. usage inputs, system of tenure, variety of seed, etc. Along with the final estimates on production and average yield the estimated extent related to the above characteristics are being disseminated.

### Data Collectors

Name	Abbreviation	Affiliation

#### SUPERVISION

"Agricultural Research and Production Assistants (ARPO) earlier known as "Govi Sevana Niyamakas" of Agrarian Development Department attached to Agrarian Service Centers do play the role of "Primary Reporters" to report the extent in P1 form which is parcel-wise enumeration of all paddy growing parcels.

They list out the area Asweddumized, Sown and Harvested in Maha and Yala seasons at village/Yaya,Tract/Kandam in the prescribed form. Here the "paddy parcel" is defined to be piece/plot of land cultivated by one individual farmer or group of farmers jointly surrounded by another paddy parcel cultivated by another individual farmer or group of farmers or any land cultivated with crops other than paddy or uncultivated land such as road, stream etc.

The paddy extent thus enumerated is summarized by Village/Yaya/Tract/Kandam and transferred to the form known as P2 which gives the aggregate extent under paddy by above categories and by irrigation modes at GN division level and by DS level. This form is prepared by the Range Statistical Officer attached to a particular DS. During the Yala season the sown and harvested extents are recorded while asweddumized extent is updated, only if there occurs a change.

However, it is to be noted that the Districts where ARPOs are not appointed, Grama Niladaris (GNN) are still acting as primary reporters for the collection of paddy statistics as well as other agricultural statistics. This is specifically true for Northern and Eastern Provinces.

The aggregate extent prepared for DS level leads to the compilation of paddy extent at various higher levels such as District and All Island Level. It is important to note that the extent reported/listed in the P1 form is the "Gross Extent" since the extent of most of the paddy parcels are not based on any cadastral survey or measures, but reported extent are based on seed rates or traditional measurement or guesstimates as per the knowledge of respective farmers. This gross extent is

ultimately converted to net-extent by applying correction factors which were determined at District level through a land measurement survey carried out by means of a sample of paddy parcels with the assistance of the Survey General Department in 1970s.

The list prepared by the primary reporters in the P1 form acts as the basis for the selection of sample of paddy parcels while the list of paddy growing villages compiled in the P2 form acts the basis to select villages for the National Crop Cutting Survey on Paddy conducted by the Agriculture and Environment Statistics Division of DCS.



## Data Processing

### Other Processing

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Average yield per acre/hectare of paddy is estimated at the Head quarters in Colombo, based on the crop cutting sample data received from the Districts using a DBASE program and SPSS software customized for this purpose by the Agriculture and Environment Statistics Division of DCS. Prior to final processing manual coding, verifications of data entries and checking outliers are performed

Data in the Form C.C.3 are entered District-wise by about 10 Data Entry Operators / Coding Clerks into a dBase III database. Then the databases they generate are merged to get the total file for the survey. This file which is in dbase form is imported to SPSS to produce standard tables.

## **Data Appraisal**

### Estimates of Sampling Error

Formulae needed to calculate Avg. Yield & Variance for a given Stratum is available in the External Resource Section.

## File Description

# Variable List

**1997\_98maha**

Content  
Cases 7909  
Variable(s) 26  
Structure Type:  
Keys: ()  
Version  
Producer  
Missing Data

**Variables**

ID	Name	Label	Type	Format	Question
V86	sea	Season	discrete	character	
V87	yr	Year	discrete	numeric	
V88	dist	District	discrete	numeric	
V89	aga	AGA Division	contin	numeric	
V90	irr	Irrigation Type	discrete	numeric	
V91	vil	Village	contin	numeric	
V92	ld	Parcel No	discrete	numeric	
V93	a	Extent sown - acres	discrete	numeric	
V94	r	Extent sown - rood	discrete	numeric	
V95	p	Extent sown - perches	contin	numeric	
V96	lid	Number of Liyaddas in Parcel	contin	numeric	
V97	len	Liyadda - length	contin	numeric	
V98	bre	Liyadda - bredth	contin	numeric	
V99	ten	System of Tenure	discrete	numeric	
V100	pre	Preparation of land	discrete	numeric	
V101	ver	Variety of Seed	discrete	numeric	
V102	sow	Sowing method	discrete	numeric	
V103	fer	Fertilizer application	discrete	numeric	Inquire from the cultivator the total quantity of fertilizer used in the parcel and give the quantity in Kg's.
V104	che	Chemical Fertilizer if applied (KG)	contin	numeric	
V105	org	Organic Fertilizer if applied (KG)	contin	numeric	
V106	wee	Weeding	discrete	numeric	
V107	inc	Insecticides	discrete	numeric	
V108	fun	Fungicides	discrete	numeric	
V109	dam	Adverse affects on Crop	discrete	numeric	
V110	yld	Yield	contin	numeric	
V111	recn	Record No	discrete	numeric	



**Season (sea)**

File: 1997\_98maha

**Overview**

Type: Discrete	Valid cases: 7909
Format: character	Invalid: 0
Width: 1	

**Description**

Maha Season is the main season associated with North-east monsoons effective during September - April in the following year.

**Year (yr)**

File: 1997\_98maha

**Overview**

Type: Discrete	Valid cases: 7909
Format: numeric	Invalid: 0
Width: 2	
Decimals: 0	
Range: 11-99	

**District (dist)**

File: 1997\_98maha

**Overview**

Type: Discrete	Valid cases: 7909
Format: numeric	Invalid: 0
Width: 2	
Decimals: 0	
Range: 1-27	

**AGA Division (aga)**

File: 1997\_98maha

**Overview**

Type: Continuous	Valid cases: 7909
Format: numeric	Invalid: 0
Width: 2	Minimum: 0
Decimals: 0	Maximum: 70
Range: 0-70	Mean: 6.4
	Standard deviation: 4.8

**Irrigation Type (irr)**

File: 1997\_98maha

**Overview**

Type: Discrete	Valid cases: 7909
Format: numeric	Invalid: 0
Width: 1	
Decimals: 0	
Range: 0-5	

**Village (vil)**

File: 1997\_98maha

**Overview**

Type: Continuous	Valid cases: 7907
Format: numeric	Invalid: 2
Width: 2	Minimum: 0
Decimals: 0	Maximum: 54
Range: 0-54	Mean: 5.6
	Standard deviation: 6.1

**Parcel No (ld)**

File: 1997\_98maha

**Overview**

Type: Discrete	Valid cases: 7909
Format: numeric	Invalid: 0
Width: 1	
Decimals: 0	
Range: 0-2	

**Description**

Paddy land Parcel is the land demarcated for the operator to cultivate

**Extent sown - acres (a)**

File: 1997\_98maha

**Overview**

Type: Discrete	Valid cases: 7908
Format: numeric	Invalid: 1
Width: 2	
Decimals: 0	
Range: 0-30	

**Extent sown - rood (r)**

File: 1997\_98maha

**Overview**

Type: Discrete	Valid cases: 7872
Format: numeric	Invalid: 37
Width: 1	
Decimals: 0	
Range: 0-9	

**Extent sown - perches (p)**

File: 1997\_98maha

**Overview**

Type: Continuous	Valid cases: 7835
Format: numeric	Invalid: 74
Width: 2	Minimum: 0
Decimals: 0	Maximum: 51
Range: 0-51	Mean: 4.5
	Standard deviation: 9.1



## Number of Liyaddas in Parcel (lid)

File: 1997\_98maha

### Overview

Type: Continuous	Valid cases: 7502
Format: numeric	Invalid: 407
Width: 3	Minimum: 0
Decimals: 0	Maximum: 260
Range: 0-260	Mean: 9.9
	Standard deviation: 20.2

### Description

Liyadda - major block of cultivation in a parcel

## Liyadda - length (len)

File: 1997\_98maha

### Overview

Type: Continuous	Valid cases: 7452
Format: numeric	Invalid: 457
Width: 3	Minimum: 0
Decimals: 0	Maximum: 750
Range: 0-750	Mean: 29.3
	Standard deviation: 45.6

## Liyadda - bredth (bre)

File: 1997\_98maha

### Overview

Type: Continuous	Valid cases: 7447
Format: numeric	Invalid: 462
Width: 3	Minimum: 0
Decimals: 0	Maximum: 702
Range: 0-702	Mean: 18.1
	Standard deviation: 30.4

## System of Tenure (ten)

File: 1997\_98maha

### Overview

Type: Discrete	Valid cases: 7908
Format: numeric	Invalid: 1
Width: 1	
Decimals: 0	
Range: 0-4	

### Description

System of Tenure could be (1) Singly owned (2)Jointly owned including Thattumaru and Kattimaru. (3) Ande (4) Other

Thattumaru - An accepted cultivation system where a each person claiming ownership of a paddy field cultivates a predetermined area of the field in rotation.

Kattimaru - Cultivating different crops in different seasons.

Ande - Permitting a non-owner to cultivate the paddy field under the condition that the crop produced from that is shared between him and the owner.

**Preparation of land (pre)**

File: 1997\_98maha

**Overview**

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-7

Valid cases: 7909  
 Invalid: 0

**Description**

Predominant method of preparation of land

**Variety of Seed (ver)**

File: 1997\_98maha

**Overview**

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-7

Valid cases: 7908  
 Invalid: 1

**Sowing method (sow)**

File: 1997\_98maha

**Overview**

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-6

Valid cases: 7908  
 Invalid: 1

**Fertilizer application (fer)**

File: 1997\_98maha

**Overview**

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-4

Valid cases: 7908  
 Invalid: 1

**Literal question**

Inquire from the cultivator the total quantity of fertilizer used in the parcel and give the quantity in Kg's.

**Chemical Fertilizer if applied (KG) (che)**

File: 1997\_98maha

**Overview**

**Chemical Fertilizer if applied (KG) (che)**

File: 1997\_98maha

Type: Continuous	Valid cases: 7892
Format: numeric	Invalid: 17
Width: 4	Minimum: 0
Decimals: 0	Maximum: 9080
Range: 0-9080	Mean: 289.7
	Standard deviation: 331.2

**Description**

To be filled if Chemical fertilizer is applied

**Organic Fertilizer if applied (KG) (org)**

File: 1997\_98maha

**Overview**

Type: Continuous	Valid cases: 7181
Format: numeric	Invalid: 728
Width: 4	Minimum: 0
Decimals: 0	Maximum: 8000
Range: 0-8000	Mean: 63.4
	Standard deviation: 455.1

**Description**

To be filled if Organic fertilizer is applied

**Weeding (wee)**

File: 1997\_98maha

**Overview**

Type: Discrete	Valid cases: 7908
Format: numeric	Invalid: 1
Width: 1	
Decimals: 0	
Range: 0-4	

**Insecticides (inc)**

File: 1997\_98maha

**Overview**

Type: Discrete	Valid cases: 7908
Format: numeric	Invalid: 1
Width: 1	
Decimals: 0	
Range: 0-2	

**Fungicides (fun)**

File: 1997\_98maha

**Overview**

Type: Discrete	Valid cases: 7908
Format: numeric	Invalid: 1
Width: 1	
Decimals: 0	
Range: 0-2	

**Adverse affects on Crop (dam)**

File: 1997\_98maha

**Overview**

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-7

Valid cases: 7904  
 Invalid: 5

**Pre question**

Codes 1,2,3,4 or 5 should be encircled only if the parcel was severely affected and it was not harvested.

**Yield (yld)**

File: 1997\_98maha

**Overview**

Type: Continuous  
 Format: numeric  
 Width: 5  
 Decimals: 2  
 Range: 0-98.23

Valid cases: 7403  
 Invalid: 506  
 Minimum: 0  
 Maximum: 98.2  
 Mean: 6.6  
 Standard deviation: 8.6

**Record No (recn)**

File: 1997\_98maha

**Overview**

Type: Discrete  
 Format: numeric  
 Width: 4  
 Decimals: 0  
 Range: 0-9825

Valid cases: 7070  
 Invalid: 839

## Related Materials

### Questionnaires

#### Crop Estimation Survey on Paddy - Survey Schedule

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Title Crop Estimation Survey on Paddy - Survey Schedule  
Filename Documentation/CC3.pdf

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### Technical documents

#### Formulae to Calculate Avg. Yield & Variance for a given Stratum

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Title Formulae to Calculate Avg. Yield & Variance for a given Stratum  
Filename Formulae to Calculate Avg. Yield & Variance for a given Stratum.doc

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### Other materials

#### Crop Estimation Survey on Paddy 2006 - Preliminary Cultivator Information Collecting Form

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Title Crop Estimation Survey on Paddy 2006 - Preliminary Cultivator Information Collecting Form  
Filename Documentation/CC1.pdf

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#### Crop Estimation Survey on Paddy - Cultivators Selected for Survey

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Title Crop Estimation Survey on Paddy - Cultivators Selected for Survey  
Filename Documentation/CC2.pdf

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#### Crop Estimation Survey on Paddy - Quality Checking Report

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Title Crop Estimation Survey on Paddy - Quality Checking Report  
Filename Documentation/CC4.pdf

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#### Study Documentation of CESP(M)98 Project

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Title Study Documentation of CESP(M)98 Project  
Filename Documentation/Study Documentation of CESP(M)98 Project.pdf

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#### Time series data of Extent, Yield and Production 77-08

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Title Time series data of Extent, Yield and Production 77-08  
Filename Time Series Data of Extent, Yield, Production 77-08.xls

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## Time Series of Sown, Harvested, Yield, Production - Maha 1970-2008

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Title Time Series of Sown, Harvested, Yield, Production - Maha 1970-2008

Filename Time Series of Sown, Harvested, Yield, Production - Maha 1970-2008.xls

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## District Codes List for Crop Estimation Survey of Paddy

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Title District Codes List for Crop Estimation Survey of Paddy

Filename Documentation/District Codes List.xls

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