Pilot Study for Developing State Level Estimates of Crop Area and Production on the basis of Sample sizes Recommended by Prof. Vaidyanathan Committee Report- Gujarat State

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Part of a research study undertaken in five states of India by

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Foreword

Agriculture with its allied sectors (viz. horticulture, animal husbandry. fishery, forestry etc.) is the largest livelihood provider making significant contribution to the national Gross Domestic Product in India. In this context, agricultural statistics has great importance for the planners for planning of most important economic policies for betterment of the people of the country. Therefore, lack of quality agricultural statistics may lead to misallocation of scarce resources and policy formulations that fail to resolve critical development problems. As such generation of timely, reliable and quality agricultural statistics assumes importance for policy planning and administrative decision making. Reviewing and upgrading mechanism for continuous generation of timely and reliable agricultural statistics therefore is of paramount importance. Two major approaches for development of appropriate methodologies for generation of agricultural statistics are (a) complete enumeration, and (b) sample survey. Sample survey is generally adopted because it provides cost effective, timely, precise and quality output. The two major components of agricultural statistics are the estimate of crop area and crop yield whereas estimates of crop production are obtained by multiplication of area estimates by corresponding yield estimates.

In India, estimates of yield rates of principal food and non-food crops are obtained on the basis of crop cutting experiments (CCEs) conducted in majority of States/Union Territory (UTs) under the National Programme of Crop Estimation Survey (CCEs). At present, over 95 per cent of the production of foodgrains is estimated on the basis of yield rates obtained from the CCE conducted on scientific basis spread over 29 States/UTs. The Directorate of Economics and Statistics (DES) releases the estimates of area, production and yield in respect of principal crops of food grains, oilseeds, sugarcane, fibers and important commercial and horticulture crops. These crops all together account for nearly 87 per cent of agriculture output. The primary responsibility for collection of statistics of land use and area under crops following prescribed procedures rests with the various State authorities. The yield rates of principal crops are estimated through General Crop Estimation survey (GCES) conducted by State agencies following the technique of stratified multi-Stage random sampling.

During past few agricultural years, a total number of approximately 9,00,000 CCEs covering 52 food and 16 non-food crops were planned in different states/Uts as compared to 1,73,097 CCEs planned during 1973-74. The number of CCEs is on the rise and as such different types of non-sampling errors etc. have affected the data quality. In order to overcome this problem, 'Improvement in Crop

Statistics (ICS) Scheme' has been in operation but desired improvement in data quality is not forthcoming.

To overcome this problem, Government of India had constituted a Committee on Improvement of Agricultural Statistics under the chairmanship of Professor A. Vaidyanathan. The Committee recommended to revamp the existing system by setting up of 'National Centre for Crop Statistics (NCSC)' for generating reliable and unbiased estimates of land use, crop area and yield at the State and National level through enumeration of sample crops in a sample of 15,000 villages with 90,000 crop cutting experiments (CCEs). The broader objectives studied were to review the problems in implementing the methodology and procedures prescribed for the collection/estimation of data on land use, cropping and yields and suggest measures to solve them: (ii) assess the potential of remote sensing techniques to collect these data and to indicate how to utilize this potential: and (iii) suggest institutional framework for Improvement of Agricultural Statistics.

In order to implement the Professor Vaidyanathan Committees recommendation to strengthen the existing system, the Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, GOI had decided to conduct a pilot sample survey through IASRI, New Delhi. Accordingly, this project was assigned to IASRI, New Delhi with the specific purpose of examining the reliability of estimates of crop area and crop production at State and National level on the basis of sample sizes recommended by the Vaidyanathan committee report covering five states of India (Assam, Gujarat, Karnataka, Orissa and Uttar Pradesh). Under this study, it was proposed (a) to develop the sampling methodology for estimation of State-wise crop area and crop yields for major food grain crops; (b) to see the adequacy/ feasibility of the sample sizes at different stages of sample selection for obtaining the estimates with suitable precision; (c) to explore the feasibility of using Personal Digital Assistant (PDA) and Global Positioning System (GPS) device in data collection work and (d) to carry out statistical comparison of data collected through Paper and Computer Assisted Personal Interview (i.e. PAPI and CAPI) in few selected tehsils. The study was conducted in the State of Gujarat covering 900 villages and conducted the 5321 CCEs across the villages.

Despite of various constraints faced during the planning and execution of field work, Centre has completed the project within time frame and as per methodology suggested by the IASRI, New Delhi. The study has come out with the suitable policy implications. I hope findings of the study would be useful for policy makers, funding agency and administrators of this programme.

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Abbreviations

AE	Area Enumeration
AERC	Agro Economic Research Centre
AIG	Agricultural Information Group
AWiFS	Advanced Wide Field Sensor
AY	Agricultural Year
CAPE	Crop Acreage and Production Estimation
CAPI	Computer Assisted Personal Interviewing
CCE	Crop Cutting Experiment
CCEs	Crop Cutting Experiments
CES FV	Crop Estimation surveys on Fruits & Vegetables
DES	Directorate of Economics & Statistics
DMI	Directorate of Marketing and Inspection
EARAS	Establishment of an Agency for Reporting Agricultural Statistics
FASAL	Forecasting Agricultural Output using Space Agro meteorology and Land-Based Observations
FOD	Field Operations Division
FS	Field Study
FSU	First Stage Unit
GCA	Gross Cropped Area
GCES	General Crop Estimation Survey
GCESs	General Crop Estimation Surveys
GDP	Gross Domestic Product
GIS	Geographical Information System
GPS	Global Positioning System
IASRI	Indian Agriculture Statistical Research Institute
ICAR	Indian Council of Agricultural Research
ICAR-IASRI	ICAR-Indian Agricultural Statistics Research Institute
ICS	Improvement of Crop Statistics Scheme
IEG	Institute of Economic Growth
IMD	Indian Meteorological Department
INCOIS	Indian National Centre for Ocean Information Services
ISI	Indian Statistical Institute
ISRO	Indian Space Research Organisation
LAI	Leaf Area Index
LUS	Land Use Statistics
MAPI	Mobile Assisted Personal Interview
MoA & FW	Ministry of Agriculture and Farmers Welfare
MoES	Ministry of Earth Sciences

MoU	Memorandum of Understanding
NAIS	National Agricultural Insurance Scheme
NCCF	National Centre for Crop Forecasting
NCFC	National Crop Forecasting Centre
NCSC	National Crop Statistics Centre
NCSC	National Crop Statistics Centre
NHB	National Horticulture Board
NRSACs	National Remote Sensing Application Centres
NRSC	National Remote Sensing Center
NSC	National Statistical Commission
NSS	National Sample Survey
NSSO	National Sample Survey Organization
PAPI	Paper Assisted Personal Interviewing
PC	Personal Computer
PDA	Personal Digital Assistant
PFZ	Potential Fishing Zones
PI	Principal Investigator
PMC	Project Management Committee
PMFBY	Pradhan Mantri Fasal BimaYojna
RS	Remote Sensing
SAC	Space Applications Centre
SAG	Statistical Analysis Group
SAR	Synthetic Aperture Radar
SASA	State Agricultural Statistics Authority
SASPP	Strengthening of Agricultural Statistics and Policy Formulation
SDDS	Special Data Dissemination Standards
SRSACs	State Remote Sensing Application Centres
SRSWOR	Simple Random Sampling Without Replacement
SSU	Second Stage Unit
TRS	Timely Reporting Scheme
TSU	Third Stage Unit
VAO	Village Assessment Officer/ Patwari

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1. Introduction

Agriculture with its allied sectors is the largest livelihood provider making significant contribution to the national Gross Domestic Product in India. Thus, agricultural statistics has great importance for the planners for planning of most important economic policies for betterment of the people of the country. Therefore, lack of quality agricultural statistics may lead to misallocation of scarce resources and policy formulations that fail to resolve critical development problems. As such generation of timely, reliable and quality agricultural statistics assumes importance for policy planning and administrative decision making. Reviewing and upgrading mechanism for continuous generation of timely and reliable agricultural statistics therefore is of paramount importance. Two major approaches for development of appropriate methodologies for generation of agricultural statistics are (a) complete enumeration, and (b) sample survey. Sample survey is generally adopted because it provides cost effective, timely, precise and quality output. The two major components of agricultural statistics are the estimate of crop area and crop yield whereas estimates of crop production are obtained by multiplication of area estimates by corresponding yield estimates.

In India, estimates of yield rates of principal food and non-food crops are obtained on the basis of crop cutting experiments (CCEs) conducted in majority of States/Union Territory (UTs) under the National Programme of Crop Estimation Survey (CCEs), At present, over 95 per cent of the production of food grains is estimated on the basis of yield rates obtained from the CCE conducted on scientific basis spread over 29 States/UTs. The Directorate of Economics and Statistics (DES) release estimates of area, production and yield in respect of principal crops of food grains, oilseeds, sugarcane, fibers and important commercial and horticulture crops. These crops all together account for nearly 87 per cent of agriculture output. The primary responsibility for collection of statistics of land use and area under crops following prescribed procedures rests with the various State authorities. The yield rates of principal crops are estimated through General Crop Estimation survey (GCES) conducted by State agencies following the technique of stratified multi-Stage random sampling.

During past few agricultural years, a total number of approximately 9,00,000 CCEs covering 52 food and 16 non-food crops were planned in different states/Uts as compared to 1,73,097 CCEs planned during 1973-74. The number of CCEs is on the rise and as such different types of non-sampling errors etc. have affected the data quality. In order to overcome this problem, 'Improvement

in Crop Statistics (ICS) Scheme' has been in operation but desired improvement in data quality is not forthcoming.

To overcome this problem, Government of India had constituted a Committee on Improvement of Agricultural Statistics under the chairmanship of Professor A. Vaidyanathan. The Committee recommended to revamp the existing system by setting up of 'National Centre for Crop Statistics (NCSC)' for generating reliable and unbiased estimates of land use, crop area and yield at the State and National level through enumeration of sample crops in a sample of 15,000 villages with 90,000 crop cutting experiments (CCEs). The broader objectives studied were to review the problems in implementing the methodology and procedures prescribed for the collection/estimation of data on land use, cropping and yields and suggest measures to solve them: (ii) assess the potential of remote sensing techniques to collect these data and to indicate how to utilize this potential: and (iii) suggest institutional framework for Improvement of Agricultural Statistics.

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2. Data and Methodology:

The study was conducted in 900 selected villages of Gujarat from all the eight agro-climatic zones and 33 districts of the state and conducted the 5321 CCEs across the villages. For the estimation of average yield, stratified four stage random sampling design was used. Every district in the Gujarat was sampled in the study. Within a district, a suitable number of tehsils were selected by Simple Random Sampling Without Replacement (SRSWOR). From each district, 50 per cent of the tehsils were selected by SRSWOR. This was followed by allocation of the villages to the selected tehsils in proportion to their GCA. Accordingly, total 900 villages from all 33 districts of the state were covered under the experiment. Survey period was agriculture year 2016-17 (June 1, 2016 to May 31, 2017). The six types enumeration schedules were canvased in the selected villages and selected survey numbers. Each selected survey number was visited by the investigator for plot to plot crop area enumeration in kharif and rabi seasons. The irrigation status of the selected crop was recorded at the time of area enumeration. MAPI (Mobile Assisted Personal Interview Version 4.1) provided by the IASRI, New Delhi was used for data collection in 12 villages of Gandhinagar district.

3. Field Observations:

- Though most of the farmers were cooperative, few farmers were not allowing field staff to enter in to the field as they argue that crop gets disturbed/damaged. As there was not substitution permitted for village as well as selected survey numbers, we had to pursue the selected farmer for selected CCEs. After continuous follow- up, somehow field staff managed to conduct the CCEs.

- In few cases, harvest of whole crop on selected plot was done by farmers, thus output of the entire field was recorded and yield for plot size under study was calculated.

- In few cases, respondents were not cooperative to provide the necessary information. So field staff had to pursue the selected respondent for the same.

- Due to some family conflicts, the 5×5 plot demarcations were removed frequently.

- In some selected villages in Saurashtra region of Gujarat, Cotton is the only crop sown during Kharif season by selected 100 survey numbers.

- Selected Village with Sole Crop, Fodder, no crop grown during crop season

- In four selected villages in Kutch region of Gujarat, no agriculture crop was sown during Kharif season of 2016.

- In some villages, only one food grain/oilseed crop was sown by selected 100 survey numbers.

- Farmers expressed hurriedness/ bored due to very large number of questions asked to them. This created difficulties in deriving the key inputs from of them which are relevant for the CCE experiments.

While conducting the field work, data entry and analysis of data for all the districts of Gujarat, several problems are encountered. Few of those major problems and observations are highlighted as followed,

- One of the major problems encountered while conducting the survey as per recommendations lay out by Professor Vaidyanathan Committee Report is major crops. As per committee's recommendation, the pilot project aimed at generating only state and national level estimates but as per request of the sponsoring agency the objective was changed to produce district level area and yield estimates of major crop. The main problem encountered was the major crops at district level may not be the same as major crops at state level. At state level, wheat is treated as major crop but in many districts cotton and groundnut was found occupying most of the selected survey numbers in our study. As per PMC recommendations, only major food grain crops are to be considered in the study so many cash and other major crops at the district level got ignored and also covering all the crops are beyond the scope of the study as the budget is allocated only for 3 crops at state level (2 in Kharif and 1 in Rabi).

- As our staff is mainly involved in field survey for research studies and cost of cultivation surveys, and therefore, to execute the project in proper manner, several training programmes were organised for the staff of the Centre. However, staff of associated institutions could not match up with the same and thus initially faced the problem in conduct of the CCEs.

- One issue frequently raised by the field staff was the difficulties in conducting CCE. CCE requires high level cooperation and coordination between at least three agencies, viz. farmers, state agency like patwaris and data collectors. It requires multiple visits for selection, identification, fixing dates for harvest, harvesting etc. It is always uncertain to fulfil all these engagements. It also requires special equipment and specific skill. Over the years, there are shortcomings in these requirements in general and tremendous reluctance on the part of farmers for some valid reasons in particular. There are other technical problems as well. The plot for CCE is selected randomly and thereby falls anywhere in the field, need not be in the corner or boundary. As a result, it is difficult to keep a small plot separately for harvest. It is also likely to damage nearby crop. It is more difficult with the introduction of mechanization of harvesting, thrashing etc. The number of CCEs is also increasing to a large extent as demand of yield estimates at disaggregate level is also increasing. Therefore, lot of compromise has to be made in the field. These definitely give rise to doubt about its efficacy and quality of data generated through CCEs. It is high time to explore some alternative methodology to generate yield estimates by using modern technology. Although, Remote Sensing technique is being in use for quite some time, results are not very encouraging, especially in the case of yield estimation.

- Though most of the farmers were cooperative, few farmers were not allowing our field staff to enter in to the field as they argue that crop gets disturbed/damaged. After continuous follow-up, somehow field staff managed to conduct the CCEs.

- In few cases, harvest of whole crop on selected plot was done by farmer/s, thus we recorded particular plot output and calculated yield for plot size under study.

- In few cases, respondents were not cooperative to provide the necessary information as well as reluctant to permit us to plot CCE in selected plot area. As there was not substitution permitted for village as well as selected survey number, we had to pursue the selected farmer for selected CCEs.

- For about 35 villages, no land data was available on GOG website (https://anyror.gujarat.gov.in/). Thus, we have used land record available at selected villages, then we selected 100 survey numbers and then done census of same and subsequent crop and plot selection.

- Few selected Survey villages were with less than 100 survey numbers (Ahmedabad region- 04 villages; Vadodara region- 22 villages)

- The data collection is done by the field staff (experiment basis/contract basis) and thus we had to depend on them for accuracy and timeliness of data sets. Despite of training provided to them on field, field staff has tendency to look for another work while conducting present work, which has negative impact on data sets. Therefore, work of CCE should be undertaken from the permanent staff of any research institute or organization so that we can track and get it correct data if any mistake found in later stage in recording data.

- Initially there was wide variation between Longitude and Latitude recorded in MAPI Software and WhatsmyGPS.com. Even same village has reported

different GPS in MAPI software. IASRI noted the submission and provided the solution for data collection though MAPPI.

- Since the survey numbers were not updated in land records of some districts, the records didn't match the field level situation. It was very difficult to trace the actual farmer/s of the selected plot. As a result, we had to put lot of efforts to reach the right plot as per sampling.

- There were a large number of dates mentioned in the schedules which farmers could not recall exactly, at some cases.

- It was felt that information on driage experiment may not be required for this pilot study.

The field staff have reported problems related data entry, which were as follows

- Due to relatively lengthy schedules, the field investigators were confused due to similar information appearing at many places of the schedules. They were of opinion that so many information/options in the schedules are not relevant for the CCE experiments. But they took more time and created confusion.

- In some cases, units of measurement were not mentioned. As a result, multiple units were used by the field staff, which made a difficult situation for supervisors and computer staff to rectify the data set and enter the date correctly.

- Preliminary village level information were repeated in Schedule I and II. Same data were needed to be entered twice. It was suggested to improve the software in such a manner that, once it is entered in one place, it should appear in other required locations.

4. About Selected Household, Crops and Crop Estimates

- The wheat was the major crop got selected for crop cutting experiments covering one fourth of total crop cutting experiments conducted in the State as it was grown by most of the farmers in Gujarat. Groundnut, bajra, tur and paddy were another major crops cultivated by the selected farmers. The other crops cultivated by the farmers were jowar, mung, maize, sesamum, urad, R&M, gram, and moth, while 1.2 per cent of households had not grown any crop on selected survey area.

- The crops sown during the early and late kharif season were paddy, jowar, bajara, maize, tur, moog, urad cotton and fodder crops. Wheat, gram, tobacco, castor and fodder crops were sown during rabi season while summer paddy, bajra and fodder crops were grown.

- On an average the age of the selected farmer household was estimated to be 51 years which was almost same in both the cases. Same the case of average education of cultivators which was estimated to be 6.6 years across crops.

- The crop-wise state level estimates indicate that the yield level of paddy crop was estimated to be 35.86 quintals per hectare, 27.35 quintals per hectare inbajra crop, 19.91 quintals per hectare of groundnut crop, 19 quintals per hectare in tur, 13.12 quintals per hectare for maize and around 8.5-8.5 quintals per hectare in case of mung and sesamum crop.

- While variation in area coverage across crops was estimated to be between 30-40 percent while yield variation was estimated to be highest of between

15-16 per cent in pulse crops (tur and mung) followed by in case of urad crop (9.3%). The lowest range of variation was estimated in groundnut crop.

- The variation in area was estimated to very high as compared to productivity level with exceptions of few cases.

- During the rabi season, wheat was the only crop was grown by the all the selected farmers of the selected sample households of selected villages of Gujarat, while gram crop was grown by selected respondents of only nine districts only. However, maize crop was grown in only three districts, while only one district was reported coverage of mung, rapeseed mustard and sasamum crop. It is very important to see limitation of coverage of crops which further limit the estimation of crop yield at district and state level.

- Professor Vaidyanathan Committee recommended a smaller sample, around 2 per cent of total villages, to generate area, yield & production estimates at state and national level. This project adopted same sample size, but attempted to generate district level estimates as requested by DES.
  - The problem of small sample became more acute as only 100 survey numbers in each selected village was covered instead of complete enumeration of the village.
  - Effectively, sample fraction becomes less than 1 per cent. As a result, many of the crops were either missed or less number of observations was available.
  - This project was also intended to cover only major food grain crops, which created another problem. Except in case of wheat during Rabi in season, no crop was found throughout the states as major.
  - It was also reported that even though particular crop was available in the selected village, but not available in the selected survey number.
  - Thus, many crops are missing and the data may not be proper representative of the crops grown in the district.
  - So, state level estimates could not be generated for most of the crops by simply adding district level estimates.

5. Conclusions & Recommendations

Professor Vaidyanathan Committee reviewed the current Agricultural Statistical System and recommended reduced sample size to generate State and National level crop area and yield estimates of principal crops and to set up an independent agency to collect & process the field data. However, this project, even though constituted on the basis of the recommendations of Professor Vaidyanathan Committee, attempted to generate estimates at district level as requested by the funding agency.

- For area estimation, sample survey approach was considered based on enumeration of 100 survey numbers randomly selected from each selected village instead of complete enumeration of selected villages.

- With the given sample size, the major crops were captured in the selected villages, if it was available. For area enumeration one of the major issues

emerged was selection of 100 survey numbers in place of complete enumeration.

- While some difficulties were faced in executing the same as discussed earlier.

- From the observations of the project, it was therefore suggested that the stratum should be agro-climatic zones instead of districts in each state to generate state as well as national level estimates which was also recommended in the report by Prof. Vaidyanathan Committee and subsequently, district level estimates could be generated by using techniques like small area estimation (SAE).

- Another issue cropped up during survey was the concept of major crop. There was lot of confusions regarding definition of major crop. A crop, which is major at state level, may not be grown by all the districts or at village level. On the other hand, crops grown in the selected field may not be the major crop at district or state level. Due to this confusion coupled with smaller sample and non-coverage of entire village, many a times, important crops were missed or unimportant crops were covered. It is, therefore, advisable to pre-determine the crops to be covered in the survey and data may be collected only on these crops.

- In this project, it was observed that day by day, implementation of CCE is becoming difficult, due to shortage of trained personnel, lack of co-ordination between farmers and primary agencies, reluctance on the part of farmers and many other operational hazards. Further, mechanized harvesting is making it difficult to keep a small plot for separate harvesting.

- There is an increasing need of disaggregate level estimates of yield estimates (e.g. for the purpose of crop insurance etc.). This further requires an increasing number of CCEs to meet this demand to generate the reliable yield estimates at disaggregate level such as village and gram panchayat level. This clearly indicates an urgent need to explore new techniques to estimate yield rates using modern technologies in order to reduce the number of CCEs significantly. It is therefore suggested to explore recent survey estimation methodologies such as integration of data, combining of survey data, small area estimation etc. to meet such demands.

- One of the objectives of this project was to explore the feasibility of using PDA and GPS device in data collection work in few selected tehsils. Accordingly, ICAR-IASRI had developed the MAPI software and selected one district in Gujarat for field data collection using hand held devices like tablets with this software. MAPI can be used in smart phones or tablets and enabled field staff to collect data directly from the field and transmit to his supervisor or to processing center. It was observed that MAPI could reduce the time lag to a considerable extent as it eliminates some activities such as data entry, submission of schedule, table scrutiny, back references etc. As some of the validation like coverage, range etc. is part of this software, many of the mistakes could be detected and rectified at the field level itself. GPS fitted with the devices would enable the software to record the location of the field, which helps in to control and manage the field work more effectively and also ensures validity of the data. The device may also measure the field, if necessary using GPS. Another advantage of this system is to have images of the experimental field and store it. This opens up lot of opportunities. Images of standing

crop along with some auxiliary information could predict yield estimates though image analysis. This software could be customized for all others survey as well. It is, therefore, suggested that hand held devices with MAPI may be used for data collection in every survey in future.

- The major objective of the study was to generate the state level estimate of crop area and yield of the major crops under considerations. But due to change in sampling design to generate district level estimates as requested by the sponsoring agency, there was a problem while selection of major crops as it varies at disaggregate level i.e. districts, village etc. than that of the state. For generation of district level estimates, the stratum was shifted to districts from agro-climatic zones which summoned in the problem of major crops as well as small or no sample size is few districts. Due to this fact, the district level estimates for all the major crops for all the districts are not been generated. For generation of state level estimates from the proposed reduced sample size, we recommend use of Agro-climatic zone as stratum instead of districts.

Chapter I

Introduction

1.1 Introduction

Agricultural sector not only plays an important role in improving the growth of rural economy but also the overall growth of economy in India. This sector promotes economic change and development in India through its causal links with factor and product markets. It employs about half of the work force, but contributes to only about 17.8 per cent of the Gross Domestic Product (GDP) in 2018-19. In the economically weaker states, however, its contribution to state domestic product and to employment is much higher. Relatively low productivity in agriculture led to a concentration of the poor in this sector. Agricultural productivity improvement contributes to growth and provides, thereby, a route for poverty reduction. Therefore, there is requirement for specific set of skills in the field of agriculture. It is also possible to reduce poverty as well as expand domestic market for industry by raising labour productivity in agriculture and spreading its gains among the low-income groups (Radhakrishana, 2019). Therefore, growth and development of agriculture is significant for transformation of Indian economy and for inclusive development (Chand, 2019).

Any kind of decisions about support and investments that are proposed to foster agricultural growth need to be based on comprehensive and accurate information about land use, factors of agricultural production, the prevailing economic and social situations that producers face, and the interaction of these with issues concerning climate change. The impacts of these factors can only be effectively measured and evaluated with appropriate agricultural statistics. However, at present there is a serious paucity of statistical data on

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which to base marketing, investment, or policy decisions, or with which to assess the efficacy of current commitments or policies (World Bank, 2011).

1.2 Agricultural Statistics[1]

The subject of agricultural statistics revolves around crop statistics with crop area, production and yield as its main parameters. Since agriculture is a land based economic activity, the Land Use Statistics (LUS) has a primacy in the agricultural statistics (GOI, 2001). LUS is a comprehensive and systematic account of natural endowment of land spanning over 328.73 million hectares of geographic space of the country, adopting the uniform concept of nine-fold land use classification[2] (GOI, 2020). Crop area statistics is the major segment of LUS. Crop statistics assimilates the diverse agro-climatically influenced crop acreage and production details of numerous crops grown on around 140 million hectares net sown area with about 141.25 percent cropping intensity in 2015-16 (GOI, 2020).

The area statistics broadly covers the utilisation pattern of land with detailed statistics relating to land put to agricultural uses. This includes the area sown under different crops in different seasons. On the other hand, yield statistics deal with productivity of land, in respect of various crops. The estimates of crop production are derived from the product of crop area and the crop yield estimates. The domain of agricultural statistics also covers social and economic aspects of the activities such as land holding pattern, cost of cultivation, whole sale and retail prices and market intelligence. Since the agricultural activities are dependent on the agro-climatic conditions and for a large country like India, these conditions are divergent across its length and the breadth, the collection of data requires large scale sample surveys,

[1] This section is based on 'Report of the Working Group on Agriculture Statistics for the Tenth Five Year Plan, Planning Commission, Government of India, 2001'.
[2] See, Annexure I.

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assimilating the diversities in its coverage. The distinctive feature of crop area and production statistics is that it matured over the past couple of centuries as a part of land revenue record system in most part of the country. It also became the basis for many other ventures for data generation and decision support. It was augmented and supported in the planning process to meet the emerging needs and to ensure its statistical credibility (GOI, 2001).

In recent years, the demand for reliable statistics and forecasts of crop prospects has increased for management of agriculture and food security. The system for forecasting and early warning mechanism for the agricultural scenario using newer technologies such as Remote Sensing and Agro–Meteorology gained importance, particularly in the context of time utility of the forecasts in decision making. The objective assessments so derived using rational and scientific approach also guards the statistics from possible non-sampling errors due to human bias, non-response and other such factors.

The system of area statistics and yield statistics in India is generally dovetailed with a well-established land revenue system having systematic record of each field (survey number) based on periodically updated cadastral survey of the villages. The statistics of land utilization and crop area statistics flow chiefly as a by-product of the land records prepared for different seasons, annually by the revenue agencies on field to field enumeration basis in all States except Kerala, Orissa and West Bengal where these statistics are based on the method of random sample surveys. The primary reporter of the Revenue Department generally known as Patwari maintains for each village a basic register called the *Khasra* (Record) register, which gives information for each survey number (field and field parcels) regarding total area, name of the owner and operator, tenure and tenancy rights, area under different land-uses, and in case the land is cultivated, area under different crops, fruit orchards, irrigated areas under crops,

sources of irrigation, etc. After the entries in the basic village register are completed for a season, the primary reporter prepares a village-wise crop abstract giving area under different crops for every season. Annual abstracts of different land use and of area irrigated from different sources are also prepared. The village totals are aggregated to obtain the figures for successive administrative levels like tehsils, districts, States and for the country as a whole. In order to bridge the data gaps in the North-Eastern States, the initiative of expanding the coverage of 'Establishment of an Agency for Reporting Agricultural Statistics (EARAS)' was taken in the Eight Plan and the EARAS scheme proposal for the Ninth Plan had included four North-Eastern States, namely, Arunachal Pradesh, Nagaland, Sikkim & Tripura.

The Directorate of Economics & Statistics (DES) in the Department of Agriculture & Co-operation under Ministry of Agriculture and Farmers Welfare, Government of India is the nodal official agency for collection, compilation and publication of major agricultural statistics. On the basis of data received from the States, the consolidated all India estimates are generated by the DES and made available to various user ministries/departments of the Government of India as well as States. The estimates are up-dated/revised on regular interval on the basis of data received from the States. Hence the DES has the crucial responsibility of coordination, monitoring and liaison with the federal States for ensuring quality, timeliness, concepts and coverage of agricultural statistics and accordingly, majority of the plan schemes on these aspects are operated through DES. The livestock census is one of the oldest statistics generation exercise in the country and same is also coordinated by the animal statistics division under Ministry of Agriculture and Farmers Welfare, Government of India. The market intelligence generally flows as the by-product of agricultural marketing system and is coordinated by DES as well as Directorate of Marketing and Inspection (DMI). The Agricultural Census, providing

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details of land holding parameters and input statistics is conducted quinquennially under the aegis of Department of Agriculture and Cooperation in collaboration with States.

Though agriculture is a state subject, the statistics is in concurrent list. This enables both Central Government as well as the State Governments to formulate and implement the schemes on Statistics to meet the respective needs of planning and decision making. Various Central Sector/ Centrally Sponsored Schemes for agricultural statistics during 9th Plan are listed below:

i) Timely Reporting Scheme (TRS)

ii) Establishment of an Agency for Reporting Agricultural Statistics (EARAS)

iii) Improvement of Crop Statistics (ICS)

iv) Strengthening of Agricultural Statistics and Policy Formulation

v) Crop Estimation surveys on Fruits and Vegetables (CES FV)

vi) Crop Acreage and Production Estimation (CAPE)

vii) Special Data Dissemination Standards (SDDS)

viii) National Centre for Crop Forecasting (NCCF)

ix) Live Stock Census

x) Estimation of Cost of Cultivation

xi) Agriculture Census

xii) Early Warning System

xiii) Market Intelligence

1.3 Evolution of the Agricultural Statistics System in India[3]

Collection of agricultural statistics in India has long been done by village level officials over most of the country except in the states under the permanent settlement system. In the pre Independence era, when land taxes were the principal source of governments' tax revenue, these officials were mostly permanent, and prominent residents of the

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[3] GOI (2011), Report of the Expert Committee on Agricultural Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture and Cooperation, February.

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village with first-hand knowledge of farmers and farming in their localities. The revenue departments of the provincial governments had put in place a system of standardized format for recording land use and cropping information and periodic inspections by higher level officials to make sure that the records were complete and accurate. The primary purpose of the system was to ensure proper assessment of land taxes – then the dominant source of government revenue. The government also depended heavily on these village records and the village officials' 'eye assessment' of the state of harvest for assessing production changes from year to year around estimates of 'normal yield' made at the time of revenue settlements. These estimates, based on impressionistic judgment rather than systematic measurement of actual yields, were necessarily very rough but adequate to keep track of the impact of droughts and other natural calamities that called for alleviation measures by the state.

The situation changed dramatically in the post-independence era when government policy sought to achieve rapid agricultural growth as part of its overall strategy to promote economic development. As the government's role in formulating and monitoring development programmes and formulating policies regarding pricing, distribution and foreign trade of farm products that constitute the bulk of consumption for most of the population became critical, the need for a system that would provide reliable and timely data on agricultural trends increased. In the early 1940s, statisticians in the Indian Statistical Institute and in government had begun to explore ways to build such a system. A systematic survey in a sample of villages to verify the accuracy of the traditional system of gathering land use and cropping through independent field verification found the *patwari* system to be reasonably reliable. However, since then the system has deteriorated progressively as the interest of State Revenue Departments for proper compilation of village level data and in

following the prescribed supervision and inspection procedures declined with the expansion in the nature, scope and range of their functions. This led to the adoption of sample survey techniques for estimating land use and cropping data at the state and national levels.

It was also clear that the 'annawari' estimate of yield could not meet the needs of planning and development. Professor Mahalanobis' path breaking work in the 1940s had shown that yields of individual crops could be estimated accurately and economically using statistical sampling techniques. This was followed by extensive work in the Indian Statistical Institute on technical aspects of design and conduct of large scale sample surveys to generate reliable data on various aspects of agriculture. The National Sample Survey (NSS), set up as part of Indian Statistical Institute (ISI), was entrusted with the task of conducting integrated sample surveys of land use, cropping and yields.

Around the same time, Statistical Wing of the Indian Council of Agriculture Research (ICAR) which subsequently became Indian Agriculture Statistics Research Institute (IASRI), led by Dr P.V. Sukhatme and Dr. V. G. Panse experimented with crop cutting on randomly sampled plots for estimation of crop yield rates. But they recommended complete enumeration of land use and cultivation for estimation of crop acreages by the revenue agency. The ICAR adopted their approach and over the next few years area estimation based on complete enumeration was extended to cover the major portion of area under food grains in almost the whole of India; and sample crop cutting was used for yield estimation of wheat and rice. This came to be the basis for official estimates.

While National Sample Survey demonstrated the feasibility of using sample surveys as a technique, the differences between its estimates and those generated by the conventional methods used by state governments were a matter of wide debate. States were opposed to leaving the responsibility entirely to a central agency like the NSS.

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There were also controversies over differences in estimates based on different designs and methods of conducting crop cutting experiments. Careful scrutiny of the data by experts showed that, provided the sampling design is statistically sound and experiments and procedures are observed meticulously, different designs and the shape and size of plots chosen for experiments will have little impact on yield estimates.

Eventually the integrated land use and cropping surveys by NSS were given up. NSS itself was taken over and made an autonomous organisation (NSSO) of the Central Government. The entire responsibility for collecting the agricultural data was given to the state governments, which continued to use the traditional patwari system. The scope of crop cutting surveys for estimating yields was however progressively expanded. Earlier experience of NSS and extensive research of experts (in ISI and NSSO) specialising in agricultural sample surveys were used to evolve a common design and methodology for use by all state governments for crop yield estimation. The responsibility for implementing sample surveys for yield estimation through General Crop Estimation Surveys (GCES) was also vested with the states.

However, failure to address the weaknesses of mechanisms for collecting and verifying data at the village level, compounded by inadequate attention given by state governments to take corrective measures, eroded the ability of the system to provide reasonably complete, reliable and timely data on crop area and yields. This led to the introduction of the present system consisting of the Timely Reporting Scheme (TRS)/ Establishment of an Agency for Reporting Area Statistics (EARAS) for area estimation and a revamping of the crop cutting surveys in a 20 per cent rotating sample of villages. It also provided for a centrally funded Improvement of Crop Statistics (ICS) scheme through which the primary data collection and conduct of GCES would be supervised and verified by special staff in an

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independent sample of some 10,000 villages and 30000 experiments.

1.4 The Present System
1.4.1 Area Estimation

The Timely Reporting Scheme (TRS) first introduced in Maharashtra and Uttar Pradesh in 1968-69 was gradually expanded to all temporarily settled areas with central government grants-in-aid as part of a centrally sponsored scheme. Its principal objective was to reduce the time lag in getting reliable and timely estimates of area sown under major crops and to provide the sampling frame for conduct of crop cutting experiments under General Crop Estimation Surveys (GCESs). The scheme envisaged that complete enumeration of crop areas by village patwaris would be done on a priority basis in 20 per cent of the villages and that village crop area statements will be submitted to higher authorities in each state by stipulated dates for preparation of advance estimates of area under major crops. The villages were randomly selected in such a way that all villages will be covered once in five years.

While TRS was used for preparation of advance crop estimates during each season, records of land use, irrigated and un-irrigated crop areas continue to be compiled by village officials in non-TRS villages. These data, which are finalized after some delay, are included in the district-wise statistics of land use and cropping pattern published by the Directorate of Economics and Statistics.

For the permanently settled areas of Kerala, Orissa and West Bengal, a separate scheme called EARAS (Establishment of an Agency for Reporting Agricultural Statistics) was started in the early 1970s and subsequently extended to the North-eastern states. Under this scheme data on land use and cropping were to be collected through sample surveys done by a dedicated group of field staff under the state statistical authority responsible for agricultural statistics with the costs

being fully met by the central government (except in west Bengal). The main features of different area statistics related schemes are set out in Annexure II.

By common agreement between the central and state statisticians, states under both schemes were expected to adopt common design for selection of sample villages, recording formats, supervision mechanisms and reporting procedures. In both segments, the task of collecting and maintaining records of plot by plot data on land use and crop area was entrusted to village level functionaries. The observance of prescribed procedures in collecting, recording, verifying their completeness and meeting time schedules for reporting was to be monitored by higher level officials of the state governments.

The scheme for Improvement of Crop Statistics (ICS) is designed to verify, through first hand inspection by an independent set of officials, the observance of prescribed procedures in collecting and recording, completeness and accuracy of information, and prescribed adoption of time schedules for reporting as well as the conduct of crop cutting experiments. It covers approximately a sub sample of 10000 villages chosen from among the TRS villages. With appropriate stratification using auxiliary information, the sample size of 10000 villages is thought adequate to generate national and state level estimates of both area and yields of major crops within a reasonable margin of (sampling) error.

The responsibility for inspection of selected clusters of sample plots in these villages is divided between Field Operations Division (FOD), NSSO (4949 villages) and state government agencies (5359 villages). The central government undertook to meet the costs of special supervisory staff in each state (at the rate of one for every ten villages) to make sure of proper recording and timely reporting by village patwaris. Each inspector is required to record the nature and extent to which primary agencies in the sample villages had deviated

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from prescribed procedures and protocols. These are being compiled and published in annual reports of the FOD of the NSSO since 1974. These reports provide a useful basis   for assessing the efficacy of TRS in providing reliable and timely data on land use and crop areas.

1.4.2 Yield estimation

During the 1950s, the traditional *annawari* system coexisted with sample crop cutting surveys. Techniques of sample surveys for yield estimation developed by statisticians in the ISI formed the basis for comprehensive national level surveys done by the NSSO, as an independent professional organisation. However, there were divergence between the estimates of NSS and official estimates. The scope and scale of crop cutting surveys were also extended during the period. Given that agriculture is entirely a state subject and that production estimates have a bearing on several sensitive policy issues (pricing, trade, public distribution. assessment and management of production shortfalls) involving centre-state relations, state governments were against leaving the entire responsibility for surveys to the central government or a central agency.

This led to the introduction of the General Crop Estimation Surveys (GCES). Under this scheme, crop cutting experiments are done in a sample of TRS/EARAS villages by one or more state agencies. By common agreement all states follow identical design and procedures for selection of sample villages and plots as well as field procedures for conduct and supervision of CCEs decided by sampling experts. The intention was to generate estimates of per hectare yields of various crops within a reasonable, specified margin of sampling error, at the state and district levels for 14 major crops and at the block level for wheat and rice. In 2004-05 more than 888,000 experiments were conducted to estimate yields for some 14 major crops and a host of minor crops in four main crop seasons (Early Kharif, Late Kharif, Rabi

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and Summer). In order to verify that the CCEs are conducted properly, the scheme provides for inspection of the experiments in a sub sample of 30000 plots in the ICS villages. Half the experiments are inspected by officials of FOD and the other half independently by state officials.

1.4.3 Use of Remote Sensing

Another major initiative is the programme to use remote sensing techniques for estimating area under major crops and forecasting their production by using it in combination with weather data. Initiated in 1988, its scope was gradually expanded to provide multiple in-season forecasts at the national level for major crops. This programme (called FASAL-Forecasting Agricultural Output using Space Agro meteorology and Land-based observations) is being implemented by Space Applications Centre, Ahmedabad and funded entirely by the Ministry of Agriculture. Currently, it provides pre harvest forecasts of (a) acreage and production for rice, wheat and potato at the state level, which are then aggregated into national forecasts; and (b) district level production for wheat, cotton, mustard, sugarcane, rabi sorghum and rabi rice which are then aggregated at the state level. Area forecasts are based on multi-date satellite imagery, which are constantly improving in terms of resolution and detail. Yield forecasts are based on empirical models of their trend relation to technology and of the relation between deviations in yield around the trend and fortnightly variations in mean temperatures. It is understood that the Ministry uses this information, along with information from TRS and other empirical models of yield, in making their advance estimates and forecasts of area and yield.

1.5 Recent Assessments of the System

That TRS/ICS/EARAS have belied expectations of contributing significantly to improvement in the quality of agricultural statistics (in

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terms of reliability, accuracy and timely availability) is well known. The deficiencies in their implementation and suggestions for remedial measures have been widely discussed in academic forums, scholarly articles, numerous seminars and, most recently, in the report of National Statistical Commission. The Commission was of the view that data from a 20 per cent sample of villages covered by TRS villages in the temporarily settled States and EARAS is large enough to estimate crop area with a sufficient degree of precision at the all- India, State and district levels. It recommended that crop area forecasts and final area estimates issued by the Ministry of Agriculture should be based on the data generated by these schemes. However, they recognized the deficiencies in the working of the system and made a number of suggestions to correct them.

- The *patwari* and the supervisors above him should be mandated to accord the highest priority to the work of the *girdawari* and the *patwari* be spared, if necessary, from other duties during the period of *girdawari*.

- The *patwari* and the primary staff employed in Establishment of an Agency for Reporting Agricultural Statistics (EARAS) should be imparted systematic and periodic training and the fieldwork should be subjected to intensive supervision by the higher-level revenue officials as well as by the technical staff.

- For proper and timely conduct of the *girdawari*, the concerned supervisory staff should be made accountable.

- Timely Reporting Scheme (TRS) and Establishment of an Agency for Reporting Agricultural Statistics (EARAS) scheme should be regarded as programmes of national importance and the Government of India at the highest level should prevail upon the State Governments to give due priority to them, deploy adequate resources for the purpose and ensure proper conduct of field operations in time.

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- In view of the importance of reliable estimates of crop production, the States should take all necessary measures to ensure that the crop cutting surveys under the General Crop Estimation Survey (GCES) are carried out strictly according to the prescribed programme.

- Efforts should be made to reduce the diversity of agencies involved in the fieldwork of crop cutting experiments and use as far as possible agricultural and statistical personnel for better control of field operations.

- A statistical study should be carried out to explore the feasibility of using the ICS data for working out a correction or adjustment factor to be applied to official statistics of crop area to generate alternative estimates of the same. Given the past experience of the Land Utilisation Surveys of the NSS and the controversies they created, the Commission is of the view that the objective of redesigning of the ICS, at present, should be restricted to working out a correction factor.

- The two series of experiments conducted under the National Agricultural Insurance Scheme (NAIS) and the General Crop Estimation Survey (GCES) should not be combined for deriving estimates of production as the objectives of the two series are different and their merger will affect the quality of general crop estimate.

- Crop estimates below the level of district are required to meet several needs including those of the National Agricultural Insurance Scheme (NAIS). Special studies should be taken up by the National Statistical Office to develop appropriate 'small area estimation' techniques for this purpose.

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Working Group on Crop Husbandry, Agricultural Inputs, Demand
and Supply Projections and Agricultural Statistics for the Eleventh Five
Year Plan (2007-12) under the Chairmanship of Prof. V.S. Vyas[4] made
the following observations:

- Agricultural Statistics system of the country is evolved over a period
  of time to reflect the complexities in the agrarian economy.
  However, the system has recently come under criticism on counts of
  reliability, timely availability, coverage, and failure to meet the
  emerging demand for statistics. The National Statistical
  Commission had reviewed the system in detail and the 10th Plan
  envisaged the implementation of its recommendations. However, a
  large number of these recommendations still remain unattended.

- Besides ensuring the implementation of these recommendations, a
  review of schemes such as Timely Reporting Scheme (TRS) and
  Improvement of Crop Statistics (ICS) that have been continuing for a
  long time, is necessary to reorient them for contemporary needs.
  The TRS can be affectively oriented to provide estimates of area
  under horticulture crop.

1.6 Recommendations of Prof. Vaidyanathan Committee

The issues concerning the deficiencies in the organization and
functioning of exiting institutional arrangements and measures needed
to remedy them were not addressed by these reviews. The NSC report
merely suggested that the possibilities of using remote sensing as
source for agricultural statistics be explored. At the instance of the
newly constituted National Statistics Commission, the Ministry of
Agriculture constituted 'Committee on Improvement of Agricultural
Statistics under the chairmanship of Professor A. Vaidyanathan' on
February 26, 2009 which was notified in Indian Gazette dated August
11, 2009 for improving agricultural statistics and to examine use of

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[4] for details, please see GOI (2006)

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remote sensing applications in agricultural statistics. The Committee was also mandated to review present schemes of Timely Reporting Scheme (TRS), Establishment of an Agency for Reporting Agricultural Statistics (EARAS) and Improvement of Crop Statistics (ICS).

The Committee has submitted its report in February 2011 and highlighted the deficiencies in current system as present system does not deliver complete, timely and reliable data. The deficiencies in the current system of both area and yield estimation are not due to deficiencies in its design. The selection of sample villages for collecting data on land use and crop area, sampling of plots for crop cutting experiments are based on rigorous and statistically sound principles. Committee recommended to revamp the existing system by setting up of National Centre for Crop Statistics (NCSC) as an autonomous, professional organization in the Ministry of Agriculture of the Government of India for generating reliable and unbiased estimates of land use, crop area and yield at the State and National level through enumeration of sample crops in a sample of 15,000 villages with 90,000 crop cutting experiments (CCEs). They proposed that this sample size will be sufficient to production of estimates at State/National level. Committee also suggested that Reliable village level data on land use and crop area are necessary for micro level planning and policy by state and local governments. The present system of recording these data must continue but steps must be taken to bring the responsibility for collection and supervision under State statistical agencies empowered to function as autonomous professionally managed organisations independent of administrative departments. The central government should support and encourage states to undertake these reforms.

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1.7 Background of Pilot Study

In order to explore the feasibility of implementing the recommendations of Professor Vaidyanathan Committee, the Directorate of Economics and Statistics (DES), Ministry of Agriculture and Farmers Welfare (MOA&FW), Government of India decided to conduct a pilot study and accordingly requested 'Indian Council Agricultural Research (ICAR)-Indian Agricultural Statistical Research Institute (IASRI)' to undertake a project in this regard. Under the pilot study, the project was planned to be executed in 5 states viz. Assam, Gujarat, Odisha, Karnataka, and Uttar Pradesh. The survey implementation was done for 4 states Assam, Odisha, Karnataka, and Uttar Pradesh for the AY 2015-16 and for Gujarat in AY 2016-17 with the following objectives.

1.8 Objectives of the Study,

a) To develop the sampling methodology for estimation of state-wise crop area and crop yields for major food grain crops,

b) To see the adequacy/feasibility of the sample sizes at different stages of sample selection for obtaining the estimates with suitable precision,

c) To explore the feasibility of using Personal Digital Assistant (PDA) and Global Positioning System (GPS) device in data collection work in few selected tehsils,

d) To carry out statistical comparison of data collected through Paper Assisted Personal Interviewing (PAPI) and Computer Assisted Personal Interviewing (CAPI) in few selected tehsils.

1.9 Limitations of the Study

The study is based on primary level of data and hence the accuracy of results depends on the accuracy with which the data were

generated. During the selection of villages/ field survey and field survey data collection, some constraints were faced by our field staff.

- Some of farmers felt that plotting the crop cutting experiment disturbed the operations as well as crop plot, thus they didn't not allow our field staff.
- While in few cases, harvest of whole particular plot was done by farmers without intimation or harvested before due date, thus we had recorded particular plot output and calculated yield for the said plot size.
- In some cases, some of the selected villages has been growing sole crop or fodder crop or even in some cases, no crop was grown.
- Since the survey numbers were not updated in land records of some districts, the records didn't match the field level situation. It was very difficult to trace the actual farmer/s of the selected plot. As a result, we had to put lot of efforts to reach the right plot as per sampling.
- Due to some family conflicts, the 5×5 plot demarcations were removed frequently.
- Some farmers didn't allow entering into the field citing the anticipated crop loss in their fields.
- Some farmers cut the harvested plots without informing the corresponding investigator/field staff.
- In some selected villages in Saurashtra region of Gujarat, Cotton is the only crop sown dung kharif season by selected 100 survey number households.
- In few selected villages in Kuchch region of Gujarat, no agriculture crop was sown in both seasons.
- In some villages, only one food grain/oilseed crop was sown by all selected 100 survey numbers.

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- For about 36 villages, no land data was available on GOG website (https://anyror.gujarat.gov.in/). Thus, we have used land record available at selected villages, then we selected 100 survey numbers and then done census of same and subsequent crop and plot selection.

- Farmers expressed hurriedness/ bored due to very large number of questions asked to them. This created difficulties in deriving the key inputs from of them which are relevant for the CCE experiments.

- There were a large number of dates mentioned in the schedules which farmers could not recall exactly, at some cases.

- It was felt that information on driage experiment may not be required for this pilot study.

1.10 Organization of Report

The present study report is divided into seven chapters including this introductory chapter. The details on methodology adopted for the selection of villages and survey numbers and analytical tools used for the estimation of area and yield at district and state level are presented in Chapter II. Chapter III presents the brief about Gujarat, details on distribution of selected villages across taluka/districts and average number of households, area and soil types in villages. The details on digitization of data collected through the paper based schedules and silent features of software used for the same is presented in Chapter IV. While details on MAPPI software is presented in Chapter V. Some of the observations during field survey and executing the crop cutting experiments are presented and discussed in Chapter VI. The last chapter presents the results and recommendations.

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The next chapter presents the data and methodology used for study.

Data and Methodology

2.1 Introduction

As mentioned earlier, this project was implemented in the State of Gujarat for the agricultural year 2016-17. This chapter presents the details on data sources used, methodology adopted for selection of sample village and fields for CCEs, data collection and analysis of data.

2.2 Project Initiation and Completion Process:

This project was proposed to be undertaken by the Directorate of Agriculture, Government of Gujarat, Gandhinagar (see Annexure III). However, due to staff constraints and pressure of implementation of ongoing schemes, the then Director of Agriculture, Government of Gujarat, Gandhinagar has approached us (vide letter dated 22.09.2015- Annexure IV and V) to act as a Project Coordinator of this study and requested us send a proposal to carry out this work. Madam Ms. Sangeeta Verma, the then Economic and Statistical Adviser, MOA & FS, GOI has also directed us to work as the Project Coordinator.

On the directions of Economic and Statistical Adviser, MOA & FS, GOI and the Director of Agriculture, Government of Gujarat, we undertook this project work with support of field staff of Government of Gujarat, field staff of NSSO, Ahmedabad; staff of local Institutions, field and office staff of CCS and AERC. The monitoring and data imputing was done by staff of the Centre. The details on the meetings[1] attended and organised for this project work is presented in Table 2.1 (Annexure VI & VIII). The representatives of IASRI, NSSO, GOG were invited in each meeting while finalising each step of study for their advice and support.

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[1] Glimpses of meetings are attached at the end of the report

Table 2.1: Details on Pilot Project Meetings Attended/Conducted

Meeting date	Authority	Place	Subject/Remark
09/09/2015	Director (Ag), GOG & Commissioner, Land revenue, GOG	Krishi Bhavan, Gandhinagar	To discuss the work to be undertaken GOG
30/11/2015	Director (Ag), GOG, Gandhinagar	Krishi Bhavan, Gandhinagar	To discuss the work to be undertaken GOG
03/03/2016	IASRI, New Delhi	IASRI, New Delhi	To discuss work to be undertaken in Gujarat
07/07/2016	IASRI; NSSO & Officer of GOG	AERC, VVN	To plan field work with support of NSSO, GOG
08/09/2016	NSSO, Ahmedabad	NSSO, Ahmedabad	About NSSO staff support in conducting CCE
20/09/2016	IASRI, New Delhi; NSSO, Ahmedabad & Officer of GOG	AERC, VVN	To plan field work with support of NSSO, GOG; Training on four Schedules and MAPPI
22/09/2016	NSSO, Ahmedabad	NSSO, Ahmedabad	About NSSO staff support
27/09/2016	Director (Ag), GOG, Gandhinagar	Krishi Bhavan, Gandhinagar	About GOG staff support
08/10/2016	NSSO and CCS Staff	Rajkot	Training and field material
21/12/2016	Joint Director (Ag), GOG, Gandhinagar	Krishi Bhavan, Gandhinagar	Updated him about field work
23/01/2017	IASRI, New Delhi; NSSO, Ahmedabad & Officer of GOG	AERC, VVN	To review the work done and work in progress
23/01/2017 & 25/01/2017	IASRI, New Delhi & Officer of AERC	Villages in Gandhinagar, Junagarh	supervision of field work completed and in progress
01/03/2017	IASRI, New Delhi; NSSO, Ahmedabad & Officer of GOG	AERC, VVN	Training to Staff of the Centre towards field data imputing in IASRI Data Software
17 & 18/03/2018	MOA & FW, GOI; IASRI, New Delhi & State Partners	IASRI, New Delhi	Review meeting
23/04/2018	IASRI, New Delhi & State Partners	AERC, VVN	Review meeting & Meeting of the Project Management Committee

Field Work is being undertaken by

 - ▸ Field and Office Staff of AERC and CCS
 - ▸ Adhoc Staff of NSSO, Regional Office Ahmedabad
 - ▸ Staff of BJVM Commerce College, Vallabh Vidyanagar
 - ▸ Field staff of Department of Agriculture, GOG (Received support at some places)
 - ▸ Unemployed Post Graduates (Economics)

Field Work Supervision was undertaken by

 - ▸ Office Staff of AERC and CCS
 - ▸ Staff of NSSO, Regional Office Ahmedabad

2.3 Study Area

The study was conducted in the State of Gujarat. The study was conducted in 900 selected villages from all the eight agro-climatic zones and 33 districts of the state. The details on study area, selected districts and villages are presented in discussed in detailed in Chapter VI.

Map 2.1: Location map of the Study Area
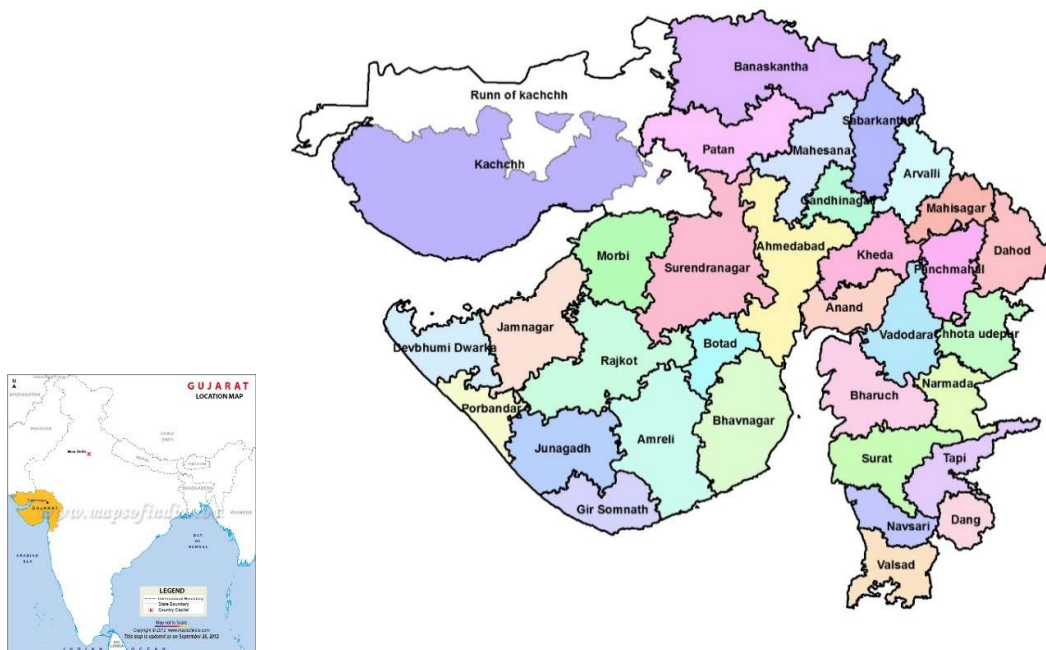
There were 33 districts, 249 Talukas and 18245 villages in Gujarat at the time of sampling. While there was no complete list of villages as per new districts formation. On 15 August 2013, seven new districts were created and shifting of talukas and villages were reported from one district to new/other districts.

- Aravalli was split from Sabarkantha
- Botad was created from parts of Ahmedabad and Bhavanagar districts.
- Chhota Udaipur was split from Vadodara District.
- Devbhoomi Dwarka was split from Jamnagar.
- Mahisagar was created from parts of Kheda and Panchmahal;
- Morbi was created from parts of Rajkot, Surendranagar and Jamnagar districts.
- Gir Somnath was split from Junagadh

As there was no complete updated list of villages available, we first prepared the talukawise list of villages as per Government of Gujarat Resolutions (which were available on website as per new district coverage). Then complete list of 18245 villages was supplied to IASRI New Delhi. Also the data on tehsil/Taluka wise area under major crops collected from the Director (Ag), Government of Gujarat was submitted to IASRI for selection of 900 villages for the study.

2.4 Database:

The study is based on both primary and secondary level statistics.

The secondary level data were compiled from the published sources and related Office websites, viz., Ministry of Agriculture and Farmers Welfare, New Delhi; Department of Agriculture, Government of Gujarat, Gandhinagar; and published reports. The review of the past agricultural statistics system is heavily based on the following reports.

- Report of the Working Group on Agriculture Statistics for the Tenth Five Year Plan, Planning Commission, GOI, 2001.
- Working Group on Crop Husbandry, Agricultural Inputs, Demand and Supply Projections and Agricultural Statistics for the Eleventh Five Year Plan (2007-12), 2006.
- Report of Expert Committee on Agricultural Statistics under the Chairmanship of Prof. Vaidyanathan, Ministry of Agriculture and Farmers Welfare. Government of India, February 2011.
- Pilot Study for Developing State Level Estimates of Crop Area and Production on the Basis of Sample Sizes Recommended by Professor Vaidyanathan Committee Report, ICAR - Indian Agricultural Statistics Research Institute, New Delhi, July 2020.

The primary data were collected from the selected sample respondents on the basis of the sampling design described below.

2.5 Sampling Design:
2.5.1 Selection of Districts and Villages:

For the estimation of average yield, stratified four stage random sampling design was used as given below:

- **Strata** – All the districts within each State
- **PSUs** - Tehsils/Taluks/RI Circles/CD Blocks/Anchals
- **SSUs** - Revenue villages within each Tehsils/Taluks/RI Circles/CD/ Blocks/Anchals
- **TSUs** - Survey numbers/fields within each selected Revenue Village
- **CCE Plot (specific size/shape)**

- Every district in the Gujarat was sampled in the study.
- The number of villages in State were allocated to each of the district in proportion to Gross Cropped Area (major crops) of the district.

- For each district, a suitable minimum sample size was fixed based on the criteria of sample size determination.
- Within a district, a suitable number of tehsils were selected by Simple Random Sampling Without Replacement (SRSWOR). From each district, 50 per cent of the tehsils were selected by SRSWOR.
- This was followed by allocation of the villages to the selected tehsils in proportion to their GCA.
- Accordingly, total 900 villages from all 33 districts of the state were covered under the experiment (Table 2.2 -Annexure IX).

Table 2.2: District-wise No. of Villages Selected to Total Selected Villages in State

District No.	District Name	Total No. of Selected Villages
1	Ahmedabad	37
2	Amreli	62
3	Anand	19
4	Arvalli	23
5	Banaskatha	49
6	Bharuch	22
7	Bhavnagar	41
8	Botad	22
9	Mahisagar	13
10	Dahod	24
11	Dang	10
12	Gandhinagar	12
13	Devbhumi Dwarka	26
14	Jamnagar	42
15	Gir somnath	16
16	Junagadh	40
17	Kheda	26
18	Kuch	47
19	Mehsana GP	24
20	Narmada	15
21	Navsari	12
22	Panchmahal	17
23	Patan	22
24	Porbandar	12
25	Morbi	36
26	Rajkot	63
27	Sabarkantha	28
28	Surat	12
29	Surendranagar	63
30	Tapi	13
31	Chhotaudepur	17
32	Vadodara	23
33	Valsad	12
	Grand Total	900

2.5.2 Selection of Survey Numbers:

- Village data of all 900 villages were collected.

- For each selected village, the list of all survey numbers was downloaded/collected from the website of Revenue Department[2] of Govt. of Gujarat (downloaded from website - https://anyror.gujarat.gov.in/).

- For 35 selected villages, no land data was available on GOG website, thus land record available at selected villages was used or census was conducted in that village/selected village area

- All the survey numbers were included (categories under various use as per Revenue Department)

- For area estimation, out of total survey numbers in village, 100 survey numbers were selected randomly in clusters of 5 survey numbers within a selected village.

- Crop-wise frame for selections of survey number for Crop Cutting Experiments (CCEs) were generated on the basis of 100 survey numbers selected for area enumeration.

- These selected survey numbers were enumerated in both seasons (kharif and rabi) in agriculture year 2016-17.

Fig. 2.1: Details on Website of Department of Land Revenue

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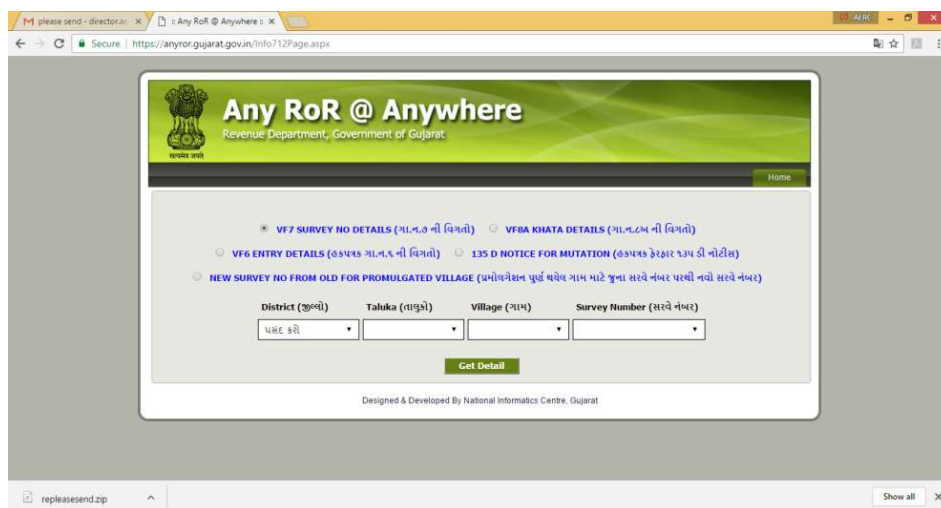
[2] In view of delay in process of selection of villages and suggestion made by Commissioner Land Revenue, GOG (availability of online land data), it was decided to go with village-wise online land records available (website- anyror).

2.6   Survey Period

- Survey Period: Agriculture year 2016-17 (June 1, 2016 to May 31, 2017).

- Each selected survey number was visited by the investigator for plot to plot crop area enumeration in kharif and rabi seasons. The irrigation status of the selected crop was recorded at the time of area enumeration.

▶ Survey was conducted by phase-wise as given below:

- ◦ Kharif Season:
    - Round 1: Information about Village, total survey numbers and Census of randomly selected 100 survey numbers (kharif crops)
    - Round 2: Visiting Selected plots and drawing the plot as per CCE procedure
    - Round 3: Collecting the information about Crop condition and Eye estimate
    - Round 4: Recording the Final Harvesting yield
    - Round 5: Recording the dried yield, if required

- ◦ Rabi Season:
    - Round 1: Census of randomly selected 100 survey numbers (rabi crops)
    - Round 2: Visiting Selected plots and drawing the plot as per CCE procedure
    - Round 3: Collecting the information about Crop condition and Eye estimate
    - Round 4: Recording the Final Harvesting yield
    - Round 5: Recording the dried yield, if required

2.7 Schedules of Enquiry

The following enumeration schedules were canvased in the selected villages and selected survey numbers (Table 2.3) (see, Annexure X & XI). The instruction manual was issued to field staff (Annexure XII and XIII).

Table 2.3: Details on Schedules Canvassed

Sr. No.	Schedule	Details	No.
1	Enumeration schedule-1 (A)	Information on selected village	900
2	Enumeration schedule-1 (B)	Enumeration of 100 survey numbers in each selected village	900
3	CCE Schedule I (Kharif)	Particulars of parcels selected for crop cutting experiments- kharif season crops	4×900
4	CCE Schedule II (Kharif)	Details of produce (wet and dry) obtained from CCE plots -kharif season crops	4×900
5	CCE Schedule III (Rabi)	Particulars of parcels selected for crop cutting experiments- rabi season crops	2×900
6	CCE Schedule IV (Rabi)	Details of produce (wet and dry) obtained from CCE plots - rabi season crops	2×900

Note: The number of CCE were less if no crop from above selected crop group/s is grown either in kharif or rabi season by selected 100 hh of selected village/s

2.8 Selected Crops and Number of CCE

▶ Food grains:
- ◦ Cereals: Paddy, Bajra, Maize, Jowar (grains), Wheat, Barley, etc.
- ◦ Pulses: Moog, Urad, Tur, Gram, other (Moth)

▶ Oilseeds:
- ◦ Edible - Groundnut, Sesamum, Rapeseed Mustard

Total CCE- 5400

- ◦ Kharif Season Crops -
  - · 02 CCE of two crops each (4 CCE) = 4×900
- ◦ Rabi Season Crops -
  - · 02 CCE of one crop (2 CCE) = 2×900

Table 2.4: Details on total number of villages surveyed in both the season with respect to actual allocated villages along with the number of CCE conducted

Districts	Total selected villages	Gujarat- Details of CCEs							
		Village census conducted	Kharif season					Rabi season		CCEs TOTAL
			AE	K-CCE 1	K-CCE 2	K-CCE 3	K-CCE 4	R-CCE 1	R-CCE 2	
Ahmedabad	37	37	37	67	35	22	22	38	38	222
Amreli	62	62	62	78	58	54	54	63	63	370
Anand	19	19	19	23	23	15	15	19	19	114
Arvalli	23	23	23	26	23	20	21	23	23	136
Banaskatha	49	49	49	49	49	49	49	49	49	294
Bharuch	22	22	22	49	29	8	8	19	19	132
Bhavnagar	41	41	39	32	31	31	31	54	54	233
Botad	22	22	22	30	20	19	19	23	19	130
Chhotaudepur	17	17	17	26	26	11	11	14	14	102
Dahod	24	24	24	24	24	24	24	24	24	144
Dang	10	10	10	10	10	10	10	10	10	60
Devbhumi Dwarka	26	26	26	29	29	23	23	26	26	156
Gandhinagar	12	12	12	11	10	11	11	14	14	71
Gir Somnath	16	16	16	27	27	5	5	16	16	96
Jamnagar	42	42	42	42	42	42	42	42	42	252
Junagadh	40	40	40	90	50	10	10	40	40	240
Kheda	26	26	26	42	42	10	10	26	26	156
Kuchch	47	47	43	45	44	37	37	33	33	229
Mahisagar	13	13	13	13	13	13	13	13	13	78
Mehsana	24	24	24	24	24	24	24	24	24	144
Morbi	36	36	36	78	53	6	7	36	36	216
Narmada	15	15	15	29	29	1	1	15	15	90
Navsari	12	12	12	17	17	7	7	12	12	72
Panchmahal	17	17	17	17	17	17	17	17	17	102
Patan	22	22	22	20	20	20	20	26	26	132
Porbandar	12	12	12	12	12	12	12	12	12	72
Rajkot	63	63	63	76	68	65	57	56	56	378
Sabarkantha	28	28	27	31	27	25	25	27	27	162
Surat	12	12	12	12	12	12	12	12	12	72
Surendranagar	63	63	63	72	72	54	54	63	63	378
Tapi	13	13	13	14	14	12	12	13	13	78
Vadodara	23	23	23	42	42	4	4	23	23	138
Valsad	12	12	12	12	12	12	12	12	12	72
Grand Total	900	900	893	1169	1004	685	679	894	890	5321

Notes:
1. Kharif crops includes- Paddy, Bajari, Jowar, Urad, Moog, Tur, Moth, Groundnut, Sesamum, Maize, others
2. Rabi crops includes -Wheat, Gram, Maize, R&M, others
3. Wherever, only one crop is grown in kharif season, attempt was made to select four survey numbers of same crop or we selected additional survey numbers from rabi selected crops
4. If no food grains crops grown in kharif season, we selected additional number of experiments crop grown in Rabi season
5. If no or only one food grains crops grown in kharif season, experiment of oilseed crops grown are included.

The procedure adopted for crop cutting experiments are presented in Chapter III.

2.9 Data in Mobile Assisted Personal Interview (MAPI)

▸ Under this project, third objective was to explore the feasibility of using personal digital assistant (PDA) device/Tablet/Smart phone in data collection (in addition to paper assisted personal interview: PAPI). The details on MAPPI software is presented in Chapter V.

▸ MAPI (Mobile Assisted Personal Interview Version 4.1) provided by the IASRI, New Delhi was used for data collection in 12 villages of Gandhinagar district

  ◦ Mansa Taluka- 05 villages
  ◦ Dehgam Taluka- 07 villages
  ◦ Collected the data related selected plots of kharif crops of Mansa Taluka of Gandhinagar district

Table 2.5: List of Selected Villages for data collection through MAPPI

Sr. No.	District	Tahsil	Village
1	Gandhinagar	Mansa	Lakroda
2	Gandhinagar	Mansa	Vijaynagar
3	Gandhinagar	Mansa	Bapupura
4	Gandhinagar	Mansa	Pratapnagar
5	Gandhinagar	Mansa	Rajpura
6	Gandhinagar	Dehgam	Anguthala
7	Gandhinagar	Dehgam	Bardoli (Bariya)
8	Gandhinagar	Dehgam	Khanpur
9	Gandhinagar	Dehgam	Amrajina Muvada
10	Gandhinagar	Dehgam	Dhamij
11	Gandhinagar	Dehgam	Ahamadpur
12	Gandhinagar	Dehgam	Sagdalpur

Map 2.2: Study Location of Selected district for MAPPI

2.10 Training and Instructions to Field Staff

▸ Collected expression of interest from field investigator for data collection work

▸ Issued a letter addressed to Sarpanch/ Talathi of Village requesting for necessary support along with GOG letter

▸ Staff were asked to get signature and office seal Mantri/Patwari/ Sarpanch on each Village information schedule to authenticate the data collected

▸ Also asked them to get no crop grown letter from the Gram Panchayat/Sarpanch/Patwari

▸ Conducted training to field staff at
  ▸ CCE, GOG, Krishi Bhavan, Gandhinagar
  ▸ AERC CCS Workshop at VVN
  ▸ Rajkot
  ▸ Meetings at AERC

▸ Field Staff were issued instructions with plot selection steps (in Gujarati) and material was provided (Annexure XII & XIII)
  ◦ Demo survey sheet- Hindi
  ◦ List of Survey Numbers in selected village with name and total area

- Village and Census Schedules
- CCE Schedules
- Pencils and Erasers
- GOG letter
- Letter to Sarpanch/Talathi
- Weighing machine

The Directorate of Agriculture, GoG had issued a letter addressed to all the District Agriculture Officer informing them to provide all possible support to field staff of this project (Annexure XIV). AERC has also issued request letter for Village Sarpanch/Talathi for support in field survey work (Annexure XV).

2.11 CCE Field Visit by AERC CCS Staff

The supervision visits were conducted by the staff of the Centre as per details given in Table 2.6. Besides, senior staff of NSSO and associated institutions have also conducted separate supervision visit to monitor data collection and reporting process. The field visit report was noted in prescribed format developed for the same (Annexure XVI).

Table 2.6: Details on Supervision Visits undertaken by the Staff of the Centre

Sr. No.	Districts	No. of Villages	Date of Visit
1	Mahisagar	05	26/11/2016
2.	Panchmahal	03	27/11/2016
3.	Surat	04	27/11/2016
4.	Amreli	02	27/11/2016
5.	Narmada	03	28/11/2016
6.	Surendrnagar	07	28/11/2016
7.	Aravalli	04	28/11/2016
8.	Sabarkantha	04	29/11/2016
9.	Kheda	02	04/12/2016
10.	Ahmedabad	03	10/12/2016
11.	Ahmedabad	03	11/12/2016
12	Banaskantha	07	25/12/2016
13.	Gandhinagar*	01	23/01/2017
14.	Junagarh*	01	24/01/2017
15.	Gir Somnath*	01	25/01/2017
16.	Gandhinagar	05	03/02/2017
17.	Gandhinagar	05	04/02/2017
18.	Gandhinagar	02	08/02/2017

Notes: * Visits with IASRI Team; NSSO & BJVM Field Visits- separately.

2.12 Analytical Tools[3]

2.12.1 Sampling Design Adopted for Crop Yield Estimation

The sampling design adopted for the crop yield estimation is Stratified Four-Stage Random Sampling, with Districts as Strata and selected tehsils/taluks within a stratum as FSUs, revenue villages within a FSU as SSUs, survey numbers/sub-survey numbers within each selected village as TSUs and experimental plots of a specified shape and size as the fourth (ultimate) stage unit of sampling. In each selected TSU, generally two survey numbers/sub-survey numbers growing the particular crop have been selected for conducting CCEs.

District

↓

Tehsil / Taluk

↓

Revenue Village

↓

Survey/sub-survey Number

↓

CCE Plot
(Specified size / shape)
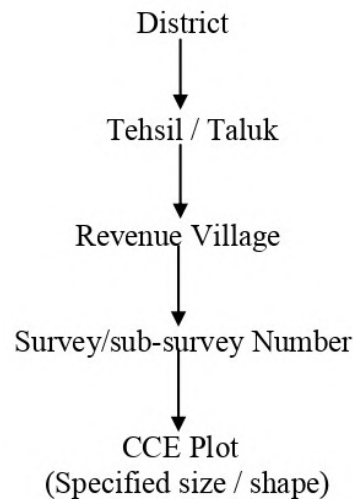
2.12.1.1 Estimation of Average Yield at District Level

Let in a district, there be L tehsil/taluk, out of which l tehsil/taluk (around 50%) were randomly selected.

Further, let

V_i= denote the total number of villages growing the crop under study in the ith tehsil/taluk

v_i = The number of selected villages out of V villages in the ith tehsil/taluk,

N_{ij} = The total number of possible CCEs in the jth village of the ith tehsil/taluk,

---

n_{ij} = The number of CCEs actually done in the jth village of the ith tehsil/taluk,

y_{ijk} = The CCE plot produce of the crop for the kth field of the jth village in the ith tehsil/taluk

A_i : Area under the crop for the ith selected tehsil/taluk,

A' : Sum of area under the crop in the l selected tehsil/taluk,

A_d : Total area under the crop for all the tehsil/taluk in the dth district, and

A : Total area under the crop for all the districts in the state.

In case no ancillary information is available, a simple estimator as given below can be built up. The estimator of average yield of the crop in the dth district is given by

$$\bar{y}_d = \sum_{i=1}^{l} \frac{A_i}{A'} . \bar{y}_{il} = \sum_{i=1}^{l} \frac{A_i}{A'} \{ \frac{1}{v_i} \sum_{j}^{v_i} (\frac{1}{n_{ij}} \sum_{k}^{n_{ij}} y_{ijk}) \}$$

where, $\bar{y}_{il}$ is the average yield of the crop on the basis of selected villages in the ith tehsil/taluk of the dth district.

The sampling variance of the estimator $\bar{y}_d$ is given by

The sampling variance of the estimator $\bar{y}_d$ is given by

$$V(\bar{y}_d) = \sum_{i=1}^{L} (\frac{A_i}{A})^2 . V(\bar{y}_{il})$$

$$V(\bar{y}_d) = \sum_{i=1}^{L} \left[\frac{A_i^2}{A'^2} \{ \left(\frac{1}{v_i} - \frac{1}{V_i} \right) S_{y_i}^2 + \sum_{i=1}^{L} \frac{1}{v_i V_i} \sum_{j=1}^{V_i} N_{ij}^2 \left(\frac{1}{n_{ij}} - \frac{1}{N_{ij}} \right) S_{y_{ij}}^2 \} \right]$$

The estimator of sampling variance of the estimator $\bar{y}_d$ is given by

$$\hat{V}(\bar{y}_d) = \sum_{i=1}^{L} (\frac{A_i}{A})^2 . \hat{V}(\bar{y}_{il}) \quad (3.2.1.4)$$

$$\hat{V}(\bar{y}_d) = \sum_{i=1}^{L} \left[\frac{A_i^2}{A'^2} \{ \left(\frac{1}{v_i} - \frac{1}{V_i} \right) s_{y_i}^2 + \sum_{i=1}^{L} \frac{1}{v_i V_i} \sum_{j=1}^{v_i} N_{ij}^2 \left(\frac{1}{n_{ij}} - \frac{1}{N_{ij}} \right) s_{y_{ij}}^2 \} \right]$$

2.12.1.2 Estimation of Average Yield at State Level

Let there be D districts in the state. A_d be the total area under the crop for the dth district and A be the total area under crop for all the districts in the state, i.e.

$$A = \sum_{d=1}^{D} A_d$$

The estimator of average yield of the crop in the state, is given by

$$\bar{y} = \sum_{d=1}^{D} \frac{A_d}{A} . \bar{y}_d ,$$

and the estimator $\bar{y}$ is unbiased.

The sampling variance of the estimator $\bar{y}$ is given by

$$V(\bar{y}) = \sum_{d=1}^{D} (\frac{A_d}{A})^2 . V(\bar{y}_d)$$

The estimator of sampling variance of the estimator $\bar{y}$ is given by

$$\hat{V}(\bar{y}) = \sum_{d=1}^{D} (\frac{A_d}{A})^2 . \hat{V}(\bar{y}_d)$$

2.12.2.1 Sampling Design Adopted for Area Estimation at District Level

The sampling design adopted for the Crop Area Estimation is Stratified Three-Stage Random Sampling design, with districts as strata and tehsil/taluk within a stratum as FSUs, revenue villages within a FSU as SSUs, survey numbers/sub-survey numbers within each selected village as TSUs of sampling. In each selected TSU i.e. survey numbers/sub-survey number, geographical area of the survey number as well as the area under the crop(s) grown was recorded

District

↓

Tehsil / Taluk

↓

Revenue Village

↓

Survey/sub-survey Number

Let,
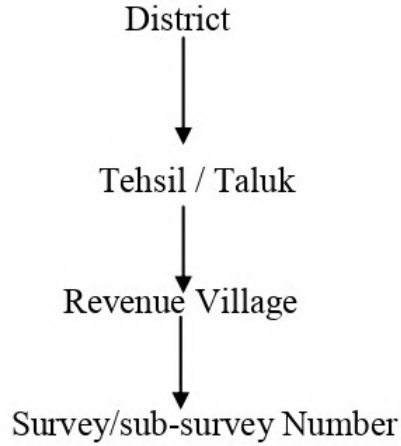
y_{ijk} = area under a particular crop in the kth survey/sub-survey number of jth village in i^{th} tehsil/taluk,

N_{ij} = total survey number/sub-survey in the jth village of ith tehsil/taluk,

n_{ij} = total number of selected survey number/sub-survey in the jth village in i^{th} tehsil/taluk,

V_i = total number of villages in the ith tehsil/taluk,

2.10.2.2 Estimation of Total area at State level

The estimate of the total area under a crop at state level is obtained by summing all the estimated of total area under the crop in each of the districts, i.e.

$$\hat{Y} = \sum_{D=1}^{S} \hat{Y}_D$$

Where

S is the total number of districts in the state

The estimate of variance of the total area under a crop at state level is obtained by summing all the estimated of variances of total area under the crop in each of the districts, i.e

$$\hat{V}(\hat{Y}) = \sum_{D=1}^{S} \hat{V}(\hat{Y}_D)$$

2.13 Chapter Summary:

This chapter has presented in detail the methodology adopted for the selection of villages and survey numbers and analytical tools used for the estimation of area and yield at district and state level.

The next chapter presents the procedure adopted during crop cutting experiments in selected field/land parcel in selected taluka/district.

About Crop Cutting Experiments (CCEs)

3.1 Introduction

As mentioned earlier, the study is based on the data collected from field through conducting the crop cutting experiments on selected land parcels by adopting stipulated procedures. This chapter presents details on CCE procedure adopted in study area.

3.2 About CCE[1]

The crop yield estimation in the country is carried out on the basis of sample survey approach. The estimates of yield rates are obtained on the basis of scientifically designed Crop Cutting Experiments (CCE) conducted under a scheme of the Directorate of Economics and Statistics, Ministry of Agriculture (DESMOA) entitled "General Crop Estimation Surveys" (GCES).

There are various steps involved in the conduct of crop cutting experiments. These steps are:

- selection of field where crop cutting experiment is to be carried out,
- locating and marking of the experimental plot of a given size in the selected field,
- harvesting of the CCE plot,
- threshing of crop harvested from the CCE plot,
- winnowing and weighing of the produce obtained from the CCE plot,
- drying of produce, if the produce contains moisture, and
- weighment of the dry produce.

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[1] CSO (2007, http://mospi.nic.in/sites/default/files/publication_reports/manual_area_crop_production_23july08_1.pdf

3.2.1 Equipment/Material requirement

The CCE technique is conducted with the help of certain equipment's/tools. These essential equipments/tools and related materials are as under:

Fig. 3.1: Equipments/Material requirement for CCE

 Measuring Tape	 **Compass**	 Rope
 Beam Balance with Weights	 **Beam Balance Pan with Weights**	 Pegs
 Spring Balance	 **Set of Weights**	 **Hessian Cloth** **Cloth bag**

3.2.2 Size and shape of the CCE plot

The size and shape of the CCE plot for various crops, in respect of different States are specified. The shapes of the cuts for various crops vary to some extent in different States. In most of the States and for many crops, the plots are either square of size 5 meters x 5 meters, 10 meters x 10 meters or rectangle of size 10 meters x 5 meters. In the State of U.P., the experimental plot is equilateral triangle of side 10 meters for most of the crops and in West Bengal, it is circle of radius 1.7145 meters approximately. For some crops, specially fruits, it consists of either specific number of trees. The plot size adopted for different food and non-food crops is as under.

Table 3.1: Cropwise Size and Shape of Plots

Name of the crop	Shape	Length (Meter)	Breadth (Meter)	Diagonal (Meter)
Paddy, Wheat, Jowar, Bajra, Ragi, Maize, Groundnut, Tobacco, Sugarcane, Korra, Greengram, Chillies, Mesta, Horsegram, Blackgram, Bengalgram, Sunflower	Square	5	5	7.07
Redgram, Sesamum, Caster, Cotton	Square	10	10	14.14

3.2.3 Selection of Field

Field is a distinct piece of land growing the crop under study which is clearly demarcated on all its sides either by bunds or by patch of other crops or left un-cultivated. As per the existing methodology of estimation of yield rates of crops, two fields with one experimental plot of the selected crop has to be conducted from each selected village (Sukhatme and Panse, 1951). For selecting two fields in each selected village, two random numbers are assigned. A selected village has number of fields. Each field has its own number called survey number or Khasra number. The highest survey number in the village may be higher, equal or less than the random number assigned. If the selected random number is equal or less than the highest survey

number, the survey number corresponding to the random number is selected. If the selected random number is higher than the highest survey number, the random number is divided by the highest survey number and the survey number corresponding to the remainder is selected. If the remainder is 0, the highest survey number is selected. If the selected crop is not grown in the selected survey number, the next survey number has to be selected. If the selected survey number is further sub divided into sub-divisions, only one sub-division has to be selected randomly. In case the selected survey/sub-division number contains more than one field growing the crop under question, the field nearest to the south west corner of survey/sub-division number is to be selected.

3.2.4 Marking of the experimental plot in the selected fields

After selection of the field, the south-west corner of the field is to be demarcated. Demarcation of south-west corner of the field is necessary for making the experimental plot in the selected field. Fixing the south-west corner of the field has made mandatory to all to make the similarity and it also helps to locate and verify the experimental plot during supervision of the field work in the absence of primary worker.

The method of marking the experimental plot for conducting the CCE is as under:

3.2.4.1 Measurement of the length and breadth of the field
a) Regular shape of the selected field

After locating the south-west corner of the field, measurements of the length and breadth of the field along the longer and shorter side are taken in steps starting from the south- west corner of the field (Fig. 3.2).

Fig. 3.2: Field in regular shape

70
steps

120 steps
SW
Length = 120 steps   Breadth = 70 steps
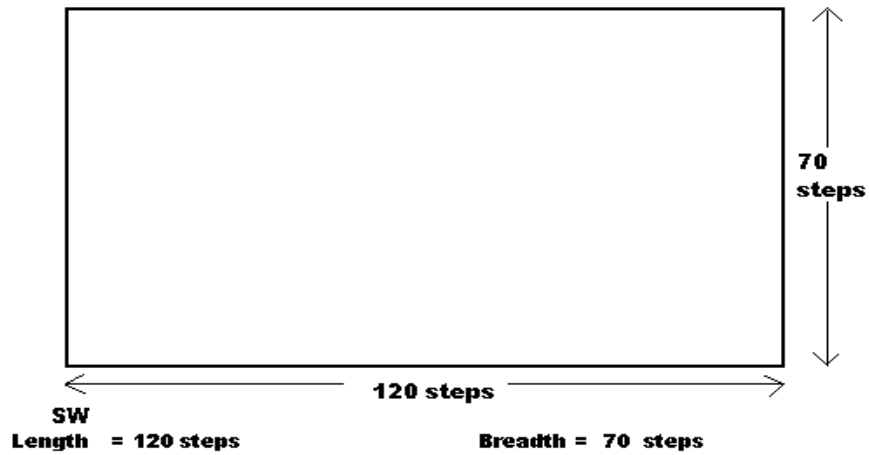
b) Irregular shape of the selected field

In case, the selected field is irregular in shape, enclose the selected field in a regular shape by outer least possible dimensions. Measure the length and breadth of the outer regular shape of the irregular field for the purpose of locating the south-west corner of the experimental plot to be demarcated. The south-west corner of the plot should be fixed with reference to the south-west corner of the outer regular shape of the irregular field (Fig. 2 and 3).

Fig. 3.3: Field in irregular shape (1)

B
R
E
A
D
T
H

SW
LENGTH
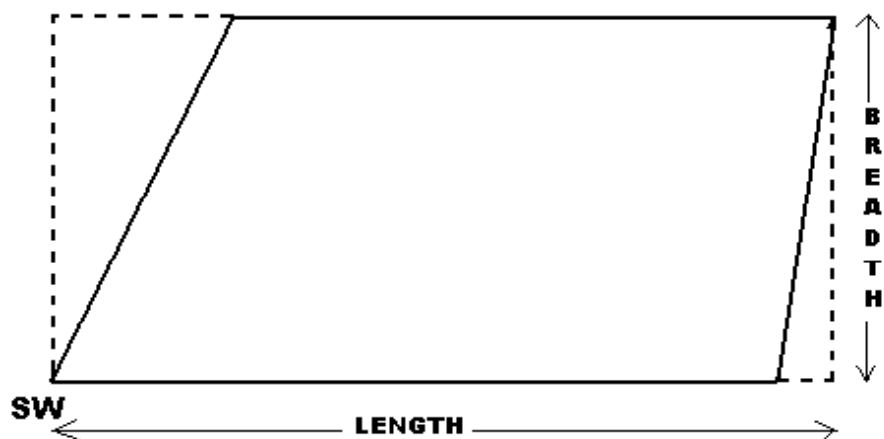
Fig. 3.4: Field in irregular shape (2)
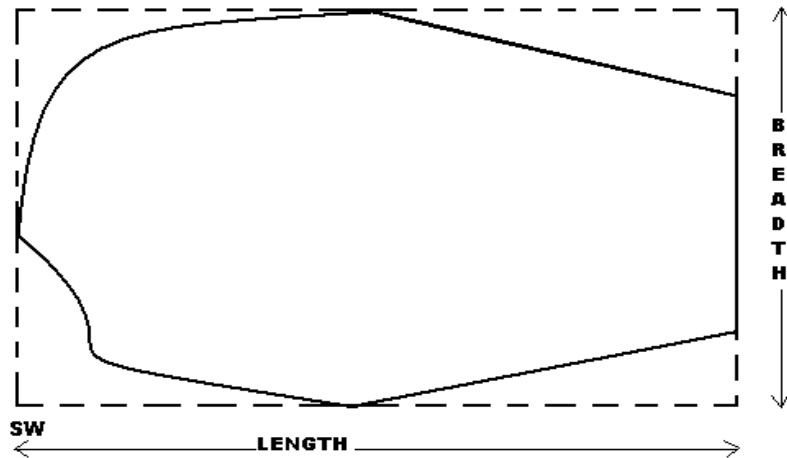
c) Determination of the random number pair

Two random numbers, one for length and the other for breadth have to be selected with the help of a random number table. These random numbers are to be selected using column number assigned to the primary worker. To ensure that the whole experimental plot gets accommodate in the selected field, steps in the length and breadth of the experimental plot have to be deducted from the length and breadth of the selected field, respectively. Suppose, the shape of the experimental plot is square of side 5 meter (generally, 7 steps are equals to 5 meter approximately).

Example:

Length of the selected field	120 Steps
Steps in the length of CCE	007 Steps
Length of the selected field **minus** number of steps in the length of CCE	113 Steps
Breadth of the selected field	70 Steps
Steps in the breadth of CCE	07 Steps
Breadth of the selected field **minus** steps in the breadth of CCE	63 Steps

Let, column number 1 of the random number table is assigned to the primary worker. A random number which is less than or equal to 113 is to be selected for length. Since, 113 comprises of three digits, therefore, by referring column number one of three-digited random number table, random number 058 appeared first which is less than 113. The random number 058 is selected for length. The second random number is to be selected for breadth. It should be less than or equal to 63. Since, 63 comprises of two digits, therefore, by referring column number one of two-digited random number table, random number 51 appeared first. This random number is less than 63. Accordingly, random number 51 is selected for breadth. (58, 51) is the pair of random number selected for locating the south-west corner of the experimental plot in the selected field. If the assigned column of random number table is exhausted during the process of selection of random numbers, the next column on the right hand side will have to be referred. If the whole or part of the experimental plot goes beyond the boundary of the selected field owing to the irregular shape of the selected field, the pair of random number should be rejected and a new pair of random number should be selected till the whole experimental plot is accommodated within the field.

d) **Marking of the experimental plot**

Marking of the experimental plot involves marking of four different corners of the desired experimental plot.

Step 1 - Marking of South-West corner of the experimental plot

In the previous example, (58, 51) is the selected pair of random number for locating the south-west corner of the experimental plot in the selected field. The selected random number for length is 58. Therefore, measure 58 steps along the length of the selected field from its south-west corner and from this point, measure 51 steps perpendicular to the length and parallel to the breadth of the selected field. Thus, the point "A" is the south-west corner of the experimental plot (Figure 3.5). The point "A" is also called as the key point or first corner of the experimental plot. Fix a peg at the key point of the experimental plot.

Figure 3.5: South-west corner of the experimental plot (Step-1)
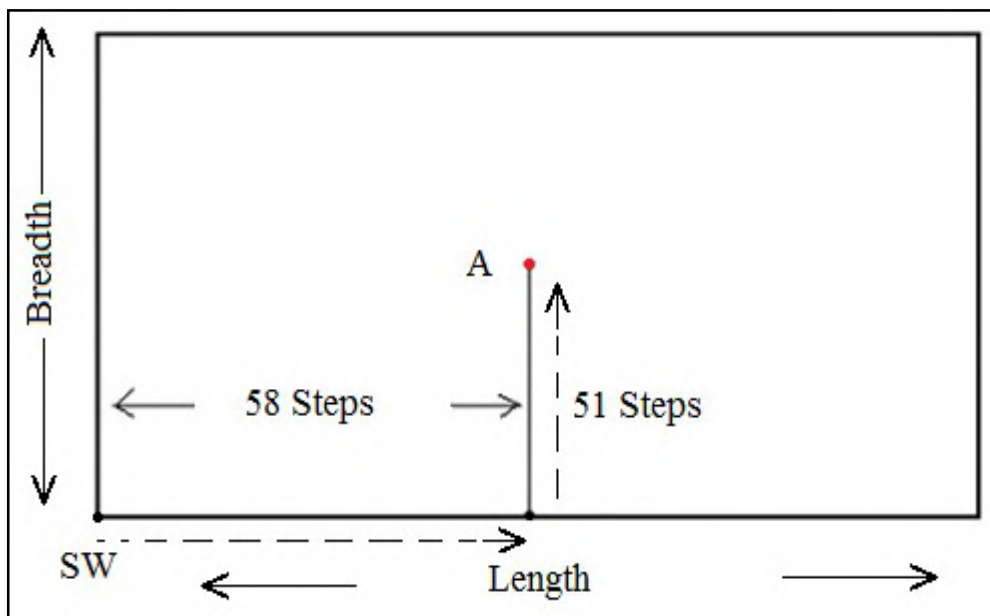
Step 2 - Marking of the second corner of the experimental plot

Five meter is to be measured along the length of the selected field from corner "A". The corner which is 5 meter away from corner "A" is the second corner of the experimental plot i.e. "B". Fix a peg at corner "B" (Figure 3.6). The line joining the point "A" and "B" is the base of the experimental plot.

Figure 3.6: Second corner of the experimental plot (Step-2)
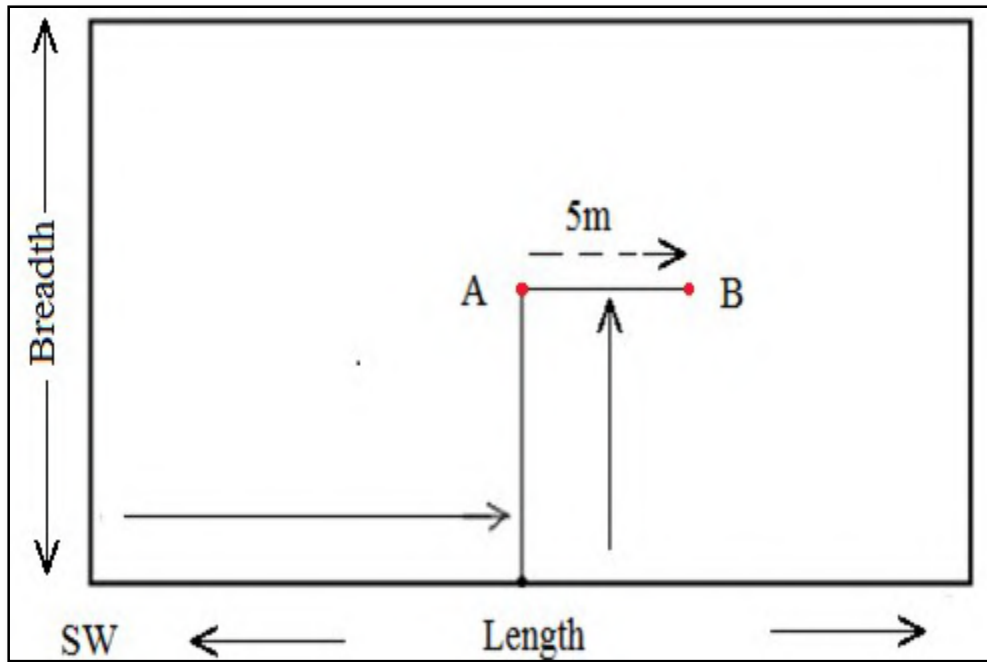
Step 3 - Marking of third corner of the experimental plot

Third and fourth corners of the experimental plot are to be marked with the help of right angle triangle method. To mark the third corner, let the first person stand at corner "A" by holding the measuring tape at 0 meter mark and second person has to stand at corner "B" holding at 12.07 (7.07+5.0) meter mark on the measuring tape. The third person holding at 7.07 [sqrt (5^2+5^2)] meter mark on the measuring tape should stretch the measuring tape in the direction of breadth of the selected field, this point shall be the third corner "C" of the experimental plot. The third corner is 7.07 meter (diagonal) away from corner "A" and 5 meter from corner "B". Fix a peg at corner "C" (Figure 3.7).

Figure 3.7: Third corner of the experimental plot (Step-3)
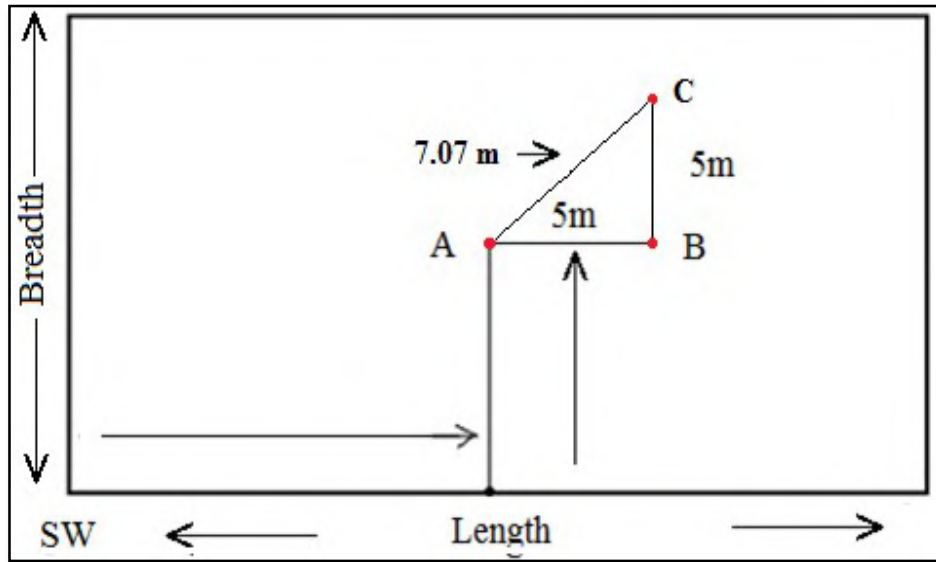
Step 4 - Marking of the fourth corner of the experimental plot

For locating the fourth corner of the experimental plot, the third person standing at corner "C" now will hold the measuring tape on 5.0 meter mark away from corner "A" and 7.07 meter away from corner "B". He should stretch the measuring tape in the direction of breadth of the field. This point is the fourth corner "D" of the experimental plot. Fix a peg at corner "D" (Figure 3.8).
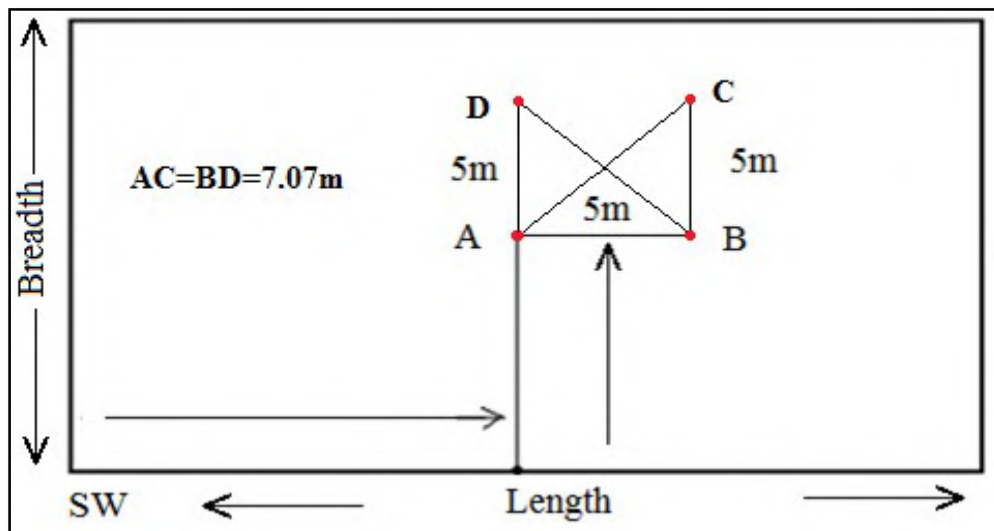
Figure 3.8: Fourth corner of the experimental plot (Step-4)

Step 5 - Marking of Final Experimental CCE plot

A, B, C and D are the four corners of the experimental plot. Check the distance between the corners. The distance between A & B, B & C, C & D and A & D should be 5 meter. The distance between both the diagonals AC and BD should also be checked and it should be 7.07 meter for each diagonal (Figure 3.9).

Figure 3.9: Final experimental plot (Step-5)
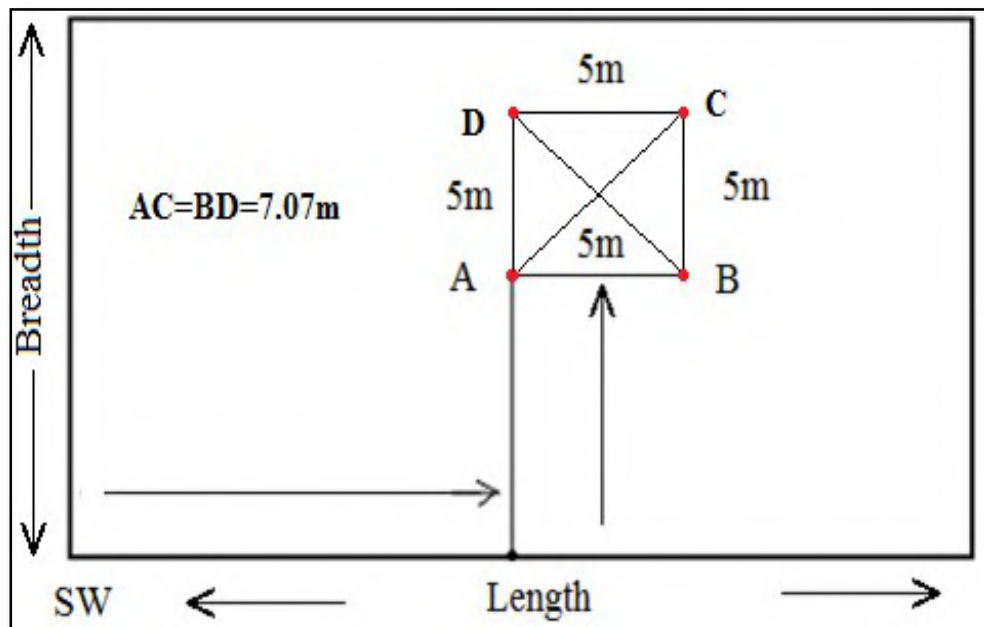
3.2.5 Harvesting of experimental plot

A well stretch string should be tied around the pegs and it should be lowered gradually to the ground level. The position of the string on the ground demarcates the boundary of the experimental plot. The decision about whether or not the plants lie within the experimental plot will be made on the basis of position of their roots. The plants on the boundary of the plot will be harvested only if the roots are more than half inside the experimental plot and will not be harvested if the roots are more than half outside the boundary of the experimental plot. Care should be taken to collect all the harvested plants and no ear head should be left in the experimental plot.

3.2.6 Threshing of the harvested plants

The harvested plants should be gathered on the threshing floor. A piece of cloth or mat should be used at threshing floor for drying and threshing the plants. The plants should be threshed carefully and all the grains should be separated by winnowing. The clean grains should be taken in a gunny bag and weighed to the nearest possible weighing unit.

3.2.7 Driage

It is necessary to carryout driage experiments to obtain estimates of yield in terms of final dried produce. Driage experiments are to be conducted at the district statistical office in respect to different crops. Crop cutting experiments supervised by District Statistical Supervisor must be selected for driage. The driage experiments are conducted in respect of 15 per cent of the experiments planned for the specified crops or subject to a minimum of four experiments per crop.

Generally, one kilogram of harvested produce should be taken at random for drying to the District Statistical Supervisor. When the produce from the experimental plot is less than one kilogram, the entire produce is to be taken. In the case of sugarcane, the final produce is expressed in terms of cane only. In the case of cotton, the final produce is expressed in terms of lint after adopting ginning percentage (kapas to lint) as obtained from the ginning factories.

A required sample of grains has to be taken in a small bag and kept for drying by the usual method for a specified period. The dry weight should be taken to the nearest possible weighing unit after the grains have dried.

The next chapter presents the digitization of data collected using paper schedules.

About Digitisation of PAPI data

4.1 Introduction

As mentioned earlier, data were collected by canvassing the schedules through personal interview survey method. After collection of the data using the paper based schedules, there is a need for analysis of the data for drawing conclusions from the collected data. But for analysis thereof the data collected through the paper based questionnaires, there is a need for digitization of the huge amount of the data to a specific format so that the scrutiny and cleaning of the data can be done easily and it can be processed for analysis. This chapter presents the details on data analysis software developed by the IASRI, New Delhi for this project work.

4.2 Digitization of data

To perform this digitization of primary data collected from the field survey from selected villages and survey numbers, data analysis software was prepared at the ICAR-IASRI and same is implemented under this pilot study in Gujarat. There are some checks and conditions which are kept inbuilt within this software like village, tehsil, district name, age of the farmer, area unit etc. so that few non-sampling errors that are very commonly found in the data can be eradicated. The software is based on .net platform and it is standalone software which works offline.

After the data entry operation is complete, the software produces a MS-Excel file of the entered data as per our required format for analysis. To make the software user friendly, the software was developed by IASRI by using .net, ASP.net and window forms of visual C# were used for designing of the user interface and coding of

business logics in the system. The database of this system contains information about each and every schedule developed under this project. SQL server 2008 has been used for database management system.

The data collection work was initiated in the states and filled-in schedules were obtained at the state headquarters. To draw inference from the collected data from the paper based survey conducted in the proposed States, IASRI developed data entry software was used to digitize the huge amount of primary data collected from the field. The data already filled in the hard copies of the schedules was entered or transferred to this software manually. The data were entered by the data entry operators, who entered each record and also made sure that the entries made are correct. There are some validating conditions in the software that resist the entry of erroneous information into the database. Thus, data entry and reconciliation were combined in this software.

4.3 Salient Features of the Data Entry Software

The data entry software provided by IASRI, New Delhi was uploaded on the desktop in the Centre. The staff of the Centre was trained by the officers of IASRI about the data entry and also attended and solved the queries raised from time to time. Some screenshots of the developed and used software are presented.

The homepage describes the project in brief and has the option to choose the data entry to enter in the software (Fig. 4.1). On clicking the option of entering the software, the choice of schedule page appears on the screen (Figure 4.2). The software contains the provision and capability of entering the data in three schedules; enumeration schedule, Schedule-I and schedule-II.

Figure 4.1: Homepage of the Data Entry Software

Figure 4.2: Choice of Schedule for Data Entry Software
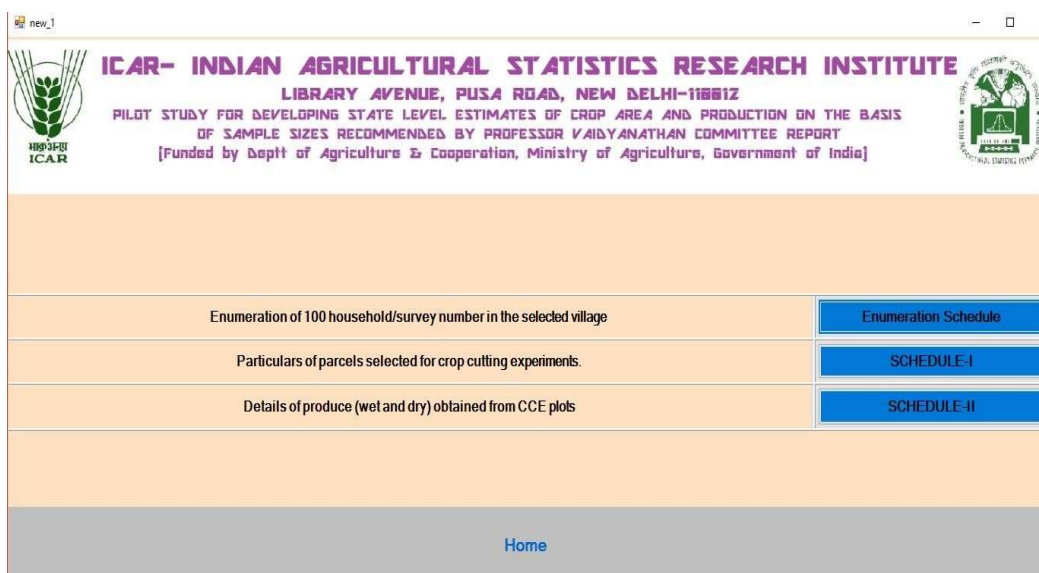
Enumeration schedule is enumeration of 100 household/survey numbers in the selected village (Fig. 4.3). In this schedule, the basic details of the selected village and farmers have been entered. The data entry operator/user can also update the village and farmers' details, if necessary. This function is available in the software. Data once entered has to be submitted so that it gets saved in the database. Once the entered data is submitted, user can view the data

which is entered by him/her. User can also generate an excel sheet of the data which is entered and submitted using the tab "Create Excel".

Figure 4.3: Enumeration of 100 households

In enumeration schedule, user has to enter the village's identification particulars and general information. Figure 4.4 shows the basic information of selected village.

Fig. 4.4: Data sheet for basic information of selected village

Once the village information has been entered into the software, next sheet reflects the details of 100 parcels selected in the village enter the (Figure 4.5). After entering all the required information, user can view the entered data into the software and can generate the excel file (Figure 4.6).

Fig. 4.5: Data sheet for enumeration of 100 survey numbers

Fig. 4.6: Excel sheet for enumeration of 100 survey numbers

Data entry for CCEs are done in phases for specially designed schedules. Enumeration schedule includes the basic details about the farmer, village and the field /parcel selected for the CCE. Once the enumeration schedule is filled up, Schedule-I is to be filled in. Schedule II is filled only after the filling up and submission of Schedule-I. The forms through which Schedule-I is digitized is given in Figure 4.7 to Figure 4.10.

Fig. 4.7: Selection of Data Sheet for Crop Cutting Experiment
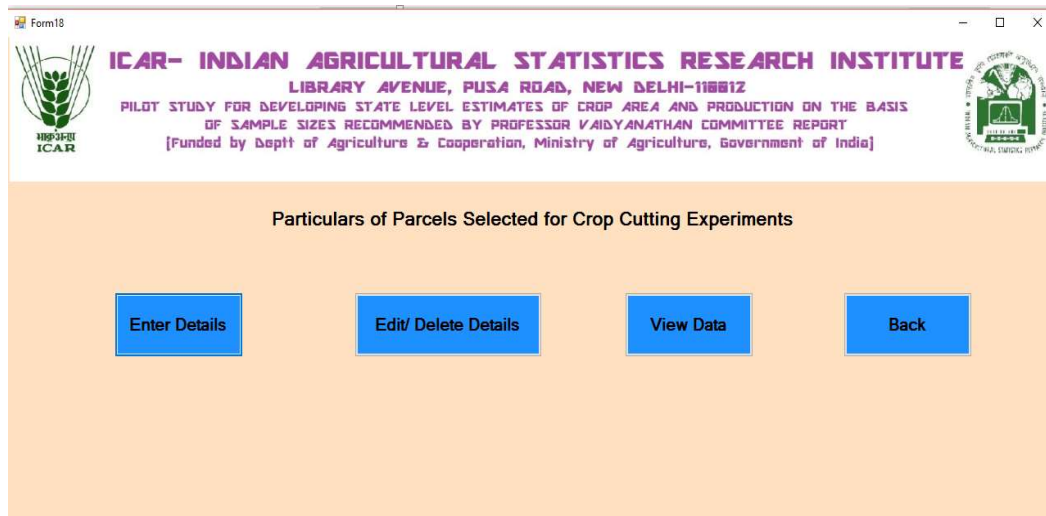
Fig. 4.8: Selection of Crop Cutting Experiment Schedule I

Fig. 4.9: Schedule I of Particular Parcel

Fig. 4.10: Selection of Experimental Plot

The schedule II provides the complete details about the produce obtained from the selected experimental field. It includes particulars of the village and experimental plot selected for the CCE, information about the input applied to the experimental crop after filling-in of schedule I. The forms through which schedule- II is digitized is given in Figure 4.11 to Figure 4.14. The Software has provision to modify and delete information at any stage of the data entry.

Fig. 4.11: Selection of Crop Cutting Experiment Schedule II

Fig. 4.12: Selection of details of Schedule II

Fig. 4.13: Sheet for Details on Inputs applied in CCE plot

Fig. 4.14: Sheet for Details on Harvesting and Threshing in CCE plots

Fig. 4.15: Sheet for Details of Produce obtained from CCE plot

4.4 Chapter Summary

This chapter presented the details on digitization of data collected through the paper based schedules and silent features of software used for the same.

The next chapter presents the details on MAPPI Software used in this study.

About MAPPI Software

5.1 Introduction

In general, data is simply another word for information. But in computing and business (most of what you read about in the news when it comes to data – especially if it's about big data), data refers to information that is machine-readable as opposed to human-readable. Data collected and analyzed in an objective manner and while presented suitably serve as basis for taking policy decisions in different fields of daily life. The important users of statistical data, among others, include Government, Industry, Business, Research Institution, Public Organizations, and International Organizations. The inferences drawn from the data help in determining future needs of the nation and also in tackling social and economic problems of people. For instance, the information on cost of living for different categories of people, living in various parts of the country, is of importance in shaping its policies in respect of wages and price levels. This chapter[1] presents the details on use of MAPPI software used.

5.2 MAPPI Software

The most conventional method of data collection is PAPI method. The PAPI method of data collection requires huge amount of man power and work. However, due to shortage of man power available with survey implementing agencies, quality and timeliness of data becomes questionable. Thus, data collection using paper-based questionnaires can be time consuming and return errors affect data accuracy, completeness, and information quality and therefore

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[1] Fully based on IASRI Report.

automated data collection and processing methods are becoming more widespread in research. Further, occurrence of various non-sampling errors during the survey, data entry and data processing etc. deteriorate the data quality and create problems to the government organizations in formulation of policies for various public sectors. To improve the method of collection of data and solve the issues raised by several government agencies in India, an android application named MAPI software, based on the idea of CAPI (Wikipedia, 2016), was developed. The software is developed based on android platform as more than 90% of Indian smart phone market is occupied by android based smart phones. Both online and offline version of the MAPI software were developed. The software was copy righted under Indian copy right act with reg. no. **SW-9378/2017**. The MAPI was tested and implemented in two Indian states namely Uttar Pradesh and Gujarat under a pilot survey entitled "Pilot study for developing State level estimates of crop area and production on the basis of sample sizes recommended by Professor Vaidyanathan Committee report" conducted by the ICAR- IASRI. In particular, the MAPI was implemented in the Bulandsahar and Pratapgarh district of Uttar Pradesh during Rabi season of AY 2015-16 and in Gandhinagar district of Gujarat during Kharif and Rabi season of AY 2016-17 in India. Three questionnaires were prepared (for both MAPI and PAPI) to collect data on crop area and yield statistics from the selected villages of each district of the two states under the pilot project.

The MAPI software was developed using the Java platform. It is a suite of programs that facilitate developing and running programs written in the Java programming language. In MAPI software the inbuilt Microsoft SQL Server was used for creating the data base while collecting the survey data. The software was developed for android version 4.1 (Jelly bean) which means it is compatible with all available android smart phones available in the market. To develop MAPI

android eclipse software was used which generate .apk (android package kit) file for installation as per the device requirement. The questionnaires are developed at ICAR-IASRI as per the requirement of the pilot project for the PAPI surveys and then it was customized in MAPI for collection of data using smart phones. The software is available online at sample survey resource server of ICAR-IASRI at http://sample.iasri.res.in/ssrs/android.html. For other customized surveys the developed software can be modified based on the request of the registered user.

5.3 Steps for using MAPI software

Steps to access MAPI in android support device:

1. Download the software from
   http://sample.iasri.res.in/ssrs/android.html
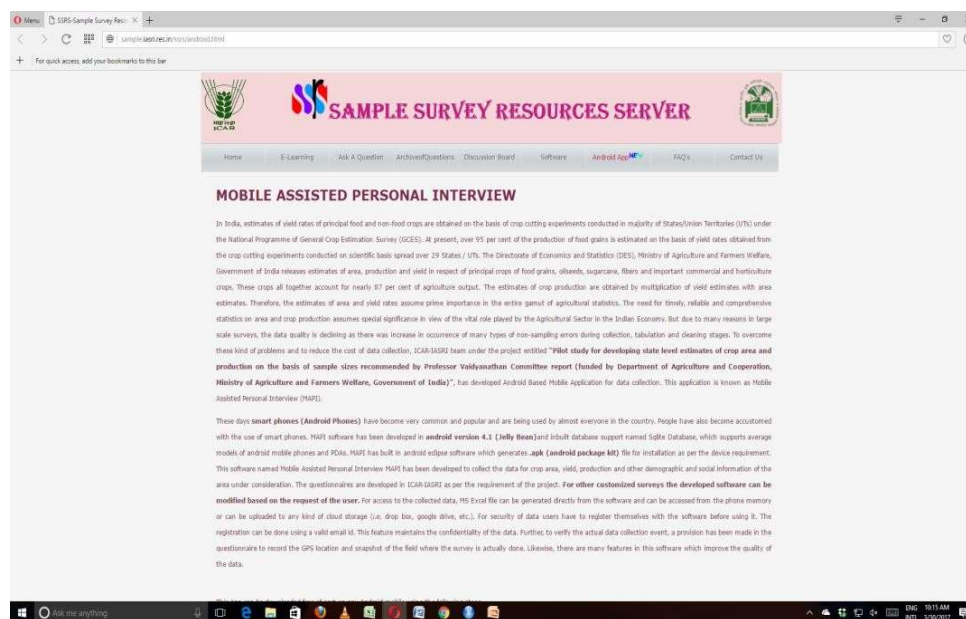
2. Install the setup file named "iasrischedule.apk" in memory of the smart phone or tablet.

3. After installation, MAPI app icon displayed on the main screen of the device, see Figure 5.1.After user click on the icon, app will open the home page. See, Figure 5.2 for home page of MAPI. The "Menu" tab in MAPI is provided for the user for navigation between several questionnaires at the time of survey.

Figure 5.1. MAPI app icon.

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4. As shown in the home screen of the application, user can easily visit the institute's website or our project team with simple click. However to use the questionnaires, user has to signup first with the application as shown in Figure 5.3.

Figure 5.2. Home page of MAPI

6   After filling one time registration form user need to click on create button, user can easily login to the application and access the schedules/questionnaires. The software is built with a remember password tab which helps the user in frequent login to the software without much constrain. The software is made to fit with the questionnaires prepared under the pilot survey planned at the institute for enumeration of crop area and yield under each selected village of each tehsil of each district of the selected 5 states of India.

Figure 5.3. Login and signup page of MAPI

5.4 Schedules in MAPPI

The following questionnaires are prepared in the MAPI software.

(I) Enumeration Schedule for Crop AE (Figure 5.4)

Figure 5.4. Enumeration Schedule

(II) CCE Schedule-1 (For selection of plots for CCE)

Particular of plots selected under each survey number for crop cutting experiment is recorded in CCE schedule-I. This questionnaire consists of questions to record the GPS and pictorial information of the selected plot of CCE as shown in Figure 5.5 & 5.6. These questions were added for verification of the user or field investigators that he actually visited the plot and conducted the selection of plot of the CCE. The users have to complete the whole questionnaire before submitting the data using the "Submit" button in the questionnaire.

Figure 5.5.CCE Schedule I

Figure 5.6: Questionnaire for GPS location and Picture of the plot

(III) CCE Schedule II (For recording the produce obtained from CCE plot)

This questionnaire or schedule-II is formulated to capture the information regarding the outcome of CCE from the farmer's field (Figure 5.7).

Figure 5.7. CCE Schedule II

5.5 Field Survey through MAPPI

The software was implemented in the selected 12 villages of Dehgam and Mansa tahsils of Gandhinagar district of the Gujarat i.e. 7 villages from Dehgam and 5 villages from Mansa tahsil. From each village, information about crop area and yield of the major food grain crops prevailing in that region were collected in this software.

Map 5.1: Taluka Map of Gandhinagar district
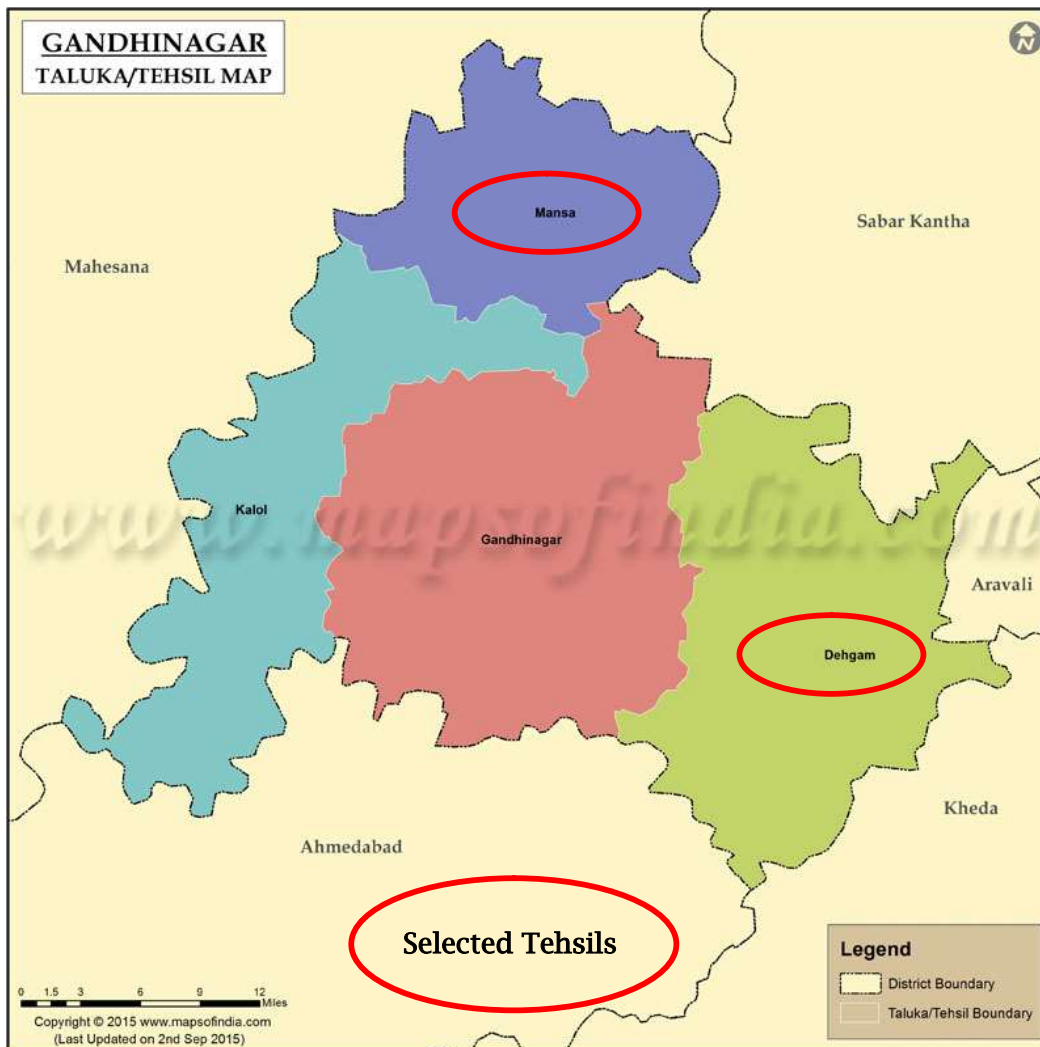
In the study area, the most predominant crop during the rabi season is wheat while few pulses along with few oilseed crops mostly rapeseed and mustard were also cultivated. Almost 90 per cent area is occupied by wheat crop. The software is found to be cost effective, less time consuming and more accurate for collection of primary data. One of the major concerns of development of MAPI is timeliness. In our country, the process of crop estimation survey takes a total of 5 years in which the first three years were spent only for data collection and data entry. To ease this process and reduce the time wasted during the above mentioned process, we have

developed this software with funding from DES, Ministry of Agriculture and Farmers Welfare, Government of India, under the pilot project. We received the data instantly in case of MAPI survey as soon as the data collection is over in ready to analyze format whereas in case of PAPI the traditional method is followed for data collection and data entry. The PAPI data were submitted in the month of in January-February 2018 almost 9 months after completion of the survey as compared to MAPI data which was submitted in May, 2017. This kind of problem prevails where regular surveys are conducted and due to these problems the outcomes of the surveys get delayed further delaying the policy decisions forthcoming out of the survey. Hence, the fact that MAPI is a faster way of data collection than the traditional PAPI surveys can be easily established. Further, MAPI software with inbuilt checks and conditions reduce certain non-sampling errors like, name of state, block, tehsil, villages, crops etc. as they are kept as prefilled and only be selected from the drop down list of names, also there were checks for area of the plot or field which should always be less than total geographical area of the village and many more. Also, there was always a chance for occurrence of error by the contractual data entry staff during the process of data entry. Also if the question is, "What is the area under a crop?" and the answer to be obtained should be certain numerical value with fixed unit of area i.e. hectare (ha) or Acre. But, after receiving the data from PAPI, the unit of area and yield of the villages became the major problem while analyzing the data as some enumerators have put the area in hectare, some in acre and some in other local units and same in case of weight of produce. Due to these problems, the data obtained by PAPI were processed by extensive cleaning and scrutinizing. The bulk of data with these errors of PAPI is almost impossible to scrutinize and clean the data in due time which leads to delay in generation of crop statistics. To solve this

problem in a single go, in MAPI, the area unit is kept fixed with hectare (ha) as standard and weight as Kilogram (kg). In MAPI, if needed the enumerator have to convert the local unit in the standard unit before giving the input. These advantages, checks and restrictions of MAPI eliminate several errors usually appears during large scale surveys making it a more reliable and efficient substitute of PAPI.

Another goal of MAPI is to validate the data i.e. it was actually collected from the field where the survey is planned. It is observed from the past surveys that many a time, surveyors fill the data without visiting the field with their own intuition due to various reasons. For this purpose, we have included a questionnaire in the MAPI for recording the GPS location of the field where the actual survey is taking place. The enumerator has to record the GPS location of the field where the survey is taking place along with the location of the south west corner of the CCE Plot used for crop yield estimation. Along with the GPS location there is also a questionnaire for taking photo of the field under the survey along with the CCE plot to verify that the enumerator actually visited the field. Further, there was a hidden questionnaire that records the date and time of collection of the data along with the email id of the field investigator which gets stored automatically in the data and it would be visible when we access the data.

Attempt was also made to check the GPS location reported on the MAPPI software with WhatsMyGPS.com

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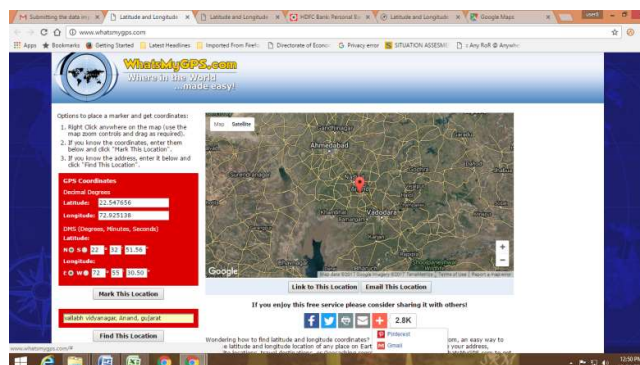
5.6 Chapter Summary:

The data collection using paper-based questionnaires is very time consuming and return errors affect data accuracy, completeness, and information quality and therefore automated data collection and processing method like MAPPI is becoming more widespread in research. This chapter presented the details on use of MAPPI software used in study area and issues related to same.

The next chapter presents the details on study area and sample villages.

About Study Area and Sample Villages

6.1 Introduction

As mentioned earlier, the study was conducted in all 33 districts of Gujarat state. This chapter presents about the study area, distribution of selected villages across the selected districts and coverage in each districts under the study.

6.2 About Study Area

Gujarat has been consistently clocking impressive agricultural growth rates. This has been possible because the government has focused on improving not only irrigation, quality of seeds and power but also subsidiary sectors like animal husbandry. The growth of the animal husbandry sector has resulted not only in increased milk production but has also provided a boost to the overall agro-economy of the state[1]. The livestock sector in Gujarat has achieved a remarkable success during last six decades due to collective efforts of government organisations, non-government organisation and the milk producers. Gujarat is one of the leading states in terms of milk production. The cooperative sector has been the key driver of the tremendous increase in Gujarat's milk production. It is not a surprise that Gujarat, the birthplace of India's white revolution, has a thriving milk cooperative sector. The largest dairy co-operative in India, Amul, is based in Anand, Gujarat. 'Amul' pattern is well known and accepted by all states in India besides some of the countries in the world[2] (Kalamkar, et.al, 2017).

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[1] http://gujaratindia.com/media/news.htm?NewsID=OwAhuSgQW4gO/FwVoIqgsQ==
[2] https://doah.gujarat.gov.in/dairy-development.htm

Gujarat with geographical area of 19,60,924 square kilometres accounts for 6.19 per cent of total geographical area of India. It has 33 districts, including 7 newly carved out districts and 248 talukas. The state is divided in to five administrative regions (see, Map 6.1). It falls in 13th Agro climatic zone of India which is further divided into eight sub-zones (see, Map 6.2). The salient features of agro-climatic zones of Gujarat state are presented in Table 6.1. Gujarat has the longest coastline of 1600 kilometres which is about 20 per cent of country's total coastline. Gujarat has varying topographic features though a major part of the state was dominated by parched and dry region. The average rainfall in the state varies widely from 250 mm to 1500 mm across various zones. Based on soil characterization, rainfall and temperature, eight agro climatic zones in Gujarat have been identified as in the state. Out of 8 agro-climatic zones, five are arid to semi-arid in nature, while remaining three are dry sub-humid in nature. Deep black to medium black soils dominate the soil types in the state. Gujarat is a leading state in India in streamlining the Soil Health Card (SHC) Programme.

Map 6.1: Administrative Regions of Gujarat

Source: http://gujenvis.nic.in/

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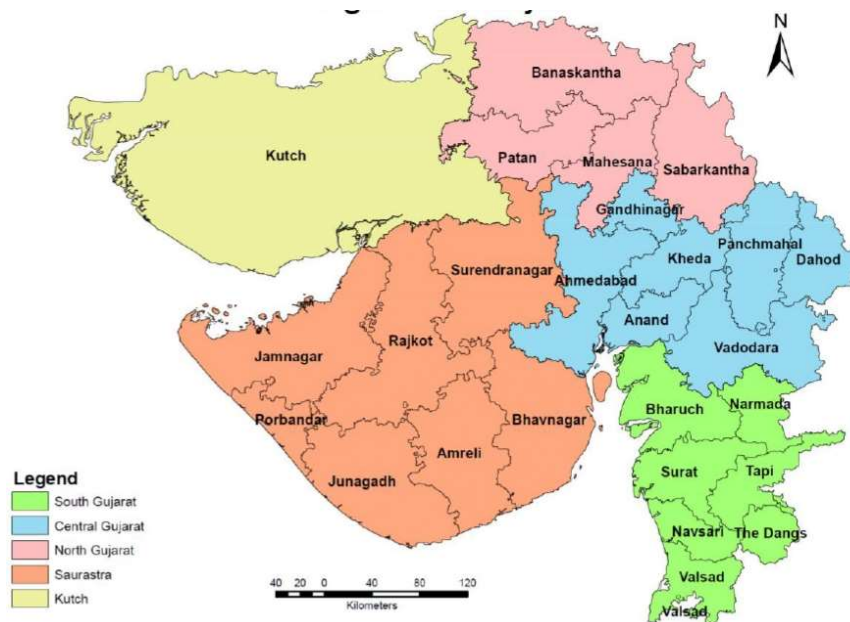
Table 6.1: Salient Features of Agro Climatic Zones of Gujarat State

Zone	Climate	Districts Covered	Rainfall (mm)	Major Crops	Soil
1	2	3	4	5	6
South Gujarat (Heavy Rain Area.)	Semi-arid to dry sub-humid	Navsari, Dang, Valsad and Valod, Vyara, songadh and Mahuva taluks of Surat.	1500 and more	Rice, Sorghum, Ragi, Kodra, Seasamum, Pigeonpea, Groundnut, Cotton, Sugarcane, Chillies, Wheat, Gram	Deep black with few patches of coastal alluvial, laterite and medium black
South Gujarat	Semi-arid to dry sub-humid	Surat and Amod, Ankleshwar, Broach, Dekdopada, Honsot, Jhagadia, Nanded, Sagbara and Valia talukas of Bharuch.	1000-1500	Rice, Wheat, Gram, Pearlmillets, Sorghum, Maize, Kodra, Ragi, Pigeonpea, groundnut, Sesamum, Castor, Cotton, Sugarcane, Chillies,	Deep black clayey
Middle Gujarat	Semi-arid	Panchmahals, Baroda and Anand, Balasinor, Borsad, Kapadvanj, Kheda, Matar, Ahmedabad, Nadiad, Petlad and Thasara and taluks of Kheda.	800-1000	Rice, Wheat, Gram, Perlmillets,Sorghum, Maize, Kodra, Ragi, Pigeonpea, Groundnut, Sesamum, Castor, Cotton, Sugarcane, Potato, Rapeseed & Mustard.	Deep black, medium black to loamy sand
North Gujarat	Arid to semi-arid	Sabarkantha, Gandhinagar, Dehgam, Daskroi, Sanand talukas of Ahmedabad, Deesa, Dhenera, Palanpur, Dandta, Wadgam taluks of Banaskantha and Chanasma, Kadi, Kalol, Kheralu, Mehsana, Patan, Sidhpur, Visnagar, Vijapur taluks and Mehsana.	625-875	Rice, Wheat, Gram, Pearlmillets, Sorghum, Maize, groundnut, Sesamum, Castor, Cotton, Sugarcane, Cumin, Rapeseed & Mustard.	Sandy loam to sandy
Bhal & Coastal Area	Dry sub-humid	Bhavnagar (Vallabhipur, Bhavnagar talukas), Ahmedabad (Dholka, Dhanduka talukas), and Vagra, Jambusa talukas of Bharuch.	625-1000	Rice, Pearl millets.	Medium black, poorly drained and saline

Table 3.1 Continued...

1	2	3	4	5	6
South Saurashtra	Dry sub-humid	Junagadh, Ghodha, Talaja, Mahava taloukas of Bhavnagar Kodinar, Rajula and Jafrabad talukas of Amerli and Dhoraji, Jetpur, Upleta talukas of Rajkot	625-750	Rice, Maize, Sugarcane Wheat, Gram Pearl millets , Sorghum, Groundnut, Seasamum, Cotton, Pulses, rapeseed & mustard	Shallow medium black calcareous
North Saurashtra	Dry sub-humid	Jamnagar, Rajkot, Chotila, Limdi, Lakhtar, Muli, Sayla, Wadhwan talukas of Surendranagar and Gadheda, Umrala, Botad, Kundla, Dihor, Garidhar, Palitana talukas of Bhavnagar and Amreli, Babra, Lathi, Lalia, Kunkavav, Khamba, Dhari taluks of Amreli	400-700	Pearl millets, Sorghum, Groundnut, Seasamum, Castor, Cotton, Pulses.	Shallow medium black
North West Zone	Arid to semi-arid	Kutch, Rajkot, Malia Halvad, Dhrangdhra, Dasada taluks of Surendranagar, Sami and Harij taluks of Mahsana, Santhalpur, Radhanpur, Kankrej, Deodar, Vav, Tharad taluks of Banaskantha and Viramgam taluka of Ahmedabad.	250	Rice, Wheat, Gram, Pearlmillets, Sorghum, Maize, Pigeon pea, groundnut, Sesamum, Castor, Cotton, Rapeseed & Mustard , barley.	Sandy and saline

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Govt. of Gujarat, Gandhinagar

Map 6.2: Agro-Climatic Zones in Gujarat
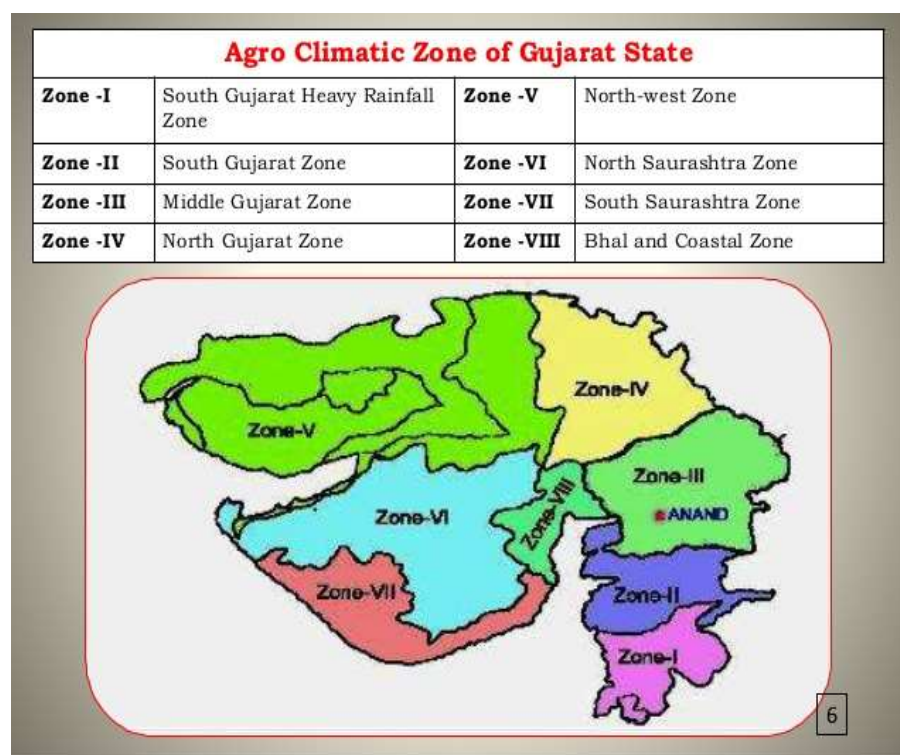
6.3 Agro-Climatic Zone-wise distribution of villages

The study was conducted in 900 selected villages. The agro-climatic wise distribution of selected villages is presented in Table 6.2. It can be seen from the table that one fourth of total selected villages were from north Saurashtra zone followed by almost 17 per cent from North Gujarat zone, 15 per cent from North West zones and more than 10 per cent from Central Zone.

Table 6.2: Agro-Climatic Zone-wise distribution of Selected villages

Zone No.	Name of zone	No. villages in zone	Percentage share in total villages
I	South Gujarat (Heavy rain)	47	5.22
II	South Gujarat	49	5.44
III	Centre Gujarat	94	10.44
IV	North Gujarat	151	16.78
V	North-West Area	135	15.00
VI	North Saurashtra	225	25.00
VII	South Saurashtra	169	18.78
VIII	Bhal and Coastal Area	30	3.33
	Gujarat State	900	100.00

6.4 District-wise distribution of villages

As per the proportion of gross cropped area under major crops, major districts having large number of villages in state total were Rajkot, Surendranagar, Amreli, Banaskantha, Kutch, Bhavnagar, Jamnagar, Junagadh and Morbi (Fig. 6.1). While out of the total villages in the district, proportion of selected villages was significant in the district of Botad, Amreli, Gandhinagar, Navsari, Sabarkantha and Tapi (Fig. 6.1 and 6.2).

Table 6.3: District-wise No. of Villages Selected to Total Selected/ Villages in State

District No.	District Name	Total No. of Selected Villages	% to State total	% to total villages in district
1	Ahmedabad	37	4.11	7.54
2	Amreli	62	6.89	10.02
3	Anand	19	2.11	5.37
4	Arvalli	23	2.56	3.40
5	Banaskantha	49	5.44	3.91
6	Bharuch	22	2.44	3.30
7	Bhavnagar	41	4.56	5.96
8	Botad	22	2.44	11.58
9	Mahisagar	13	1.44	2.94
10	Dahod	24	2.67	3.32
11	Dang	10	1.11	3.22
12	Gandhinagar	12	1.33	10.57
13	Devbhumi Dwarka	26	2.89	3.87
14	Jamnagar	42	4.67	4.86
15	Gir somnath	16	1.78	9.98
16	Junagadh	40	4.44	7.80
17	Kheda	26	2.89	5.02
18	Kuchch	47	5.22	4.59
19	Mehsana GP	24	2.67	1.84
20	Narmada	15	1.67	3.53
21	Navsari	12	1.33	10.03
22	Panchmahal	17	1.89	2.68
23	Patan	22	2.44	3.05
24	Porbandar	12	1.33	2.73
25	Morbi	36	4.00	4.07
26	Rajkot	63	7.00	8.05
27	Sabarkantha	28	3.11	10.62
28	Surat	12	1.33	3.95
29	Surendranagar	63	7.00	1.68
30	Tapi	13	1.44	11.03
31	Chhotaudepur	17	1.89	2.52
32	Vadodara	23	2.56	3.07
33	Valsad	12	1.33	2.54
	Grand Total	900	100.00	4.93

Fig. 6.1: District-wise Number of Selected Villages & Share in total selected villages in Gujarat (n= 900)

Fig.6.2: Share of Selected Villages in total villages in district
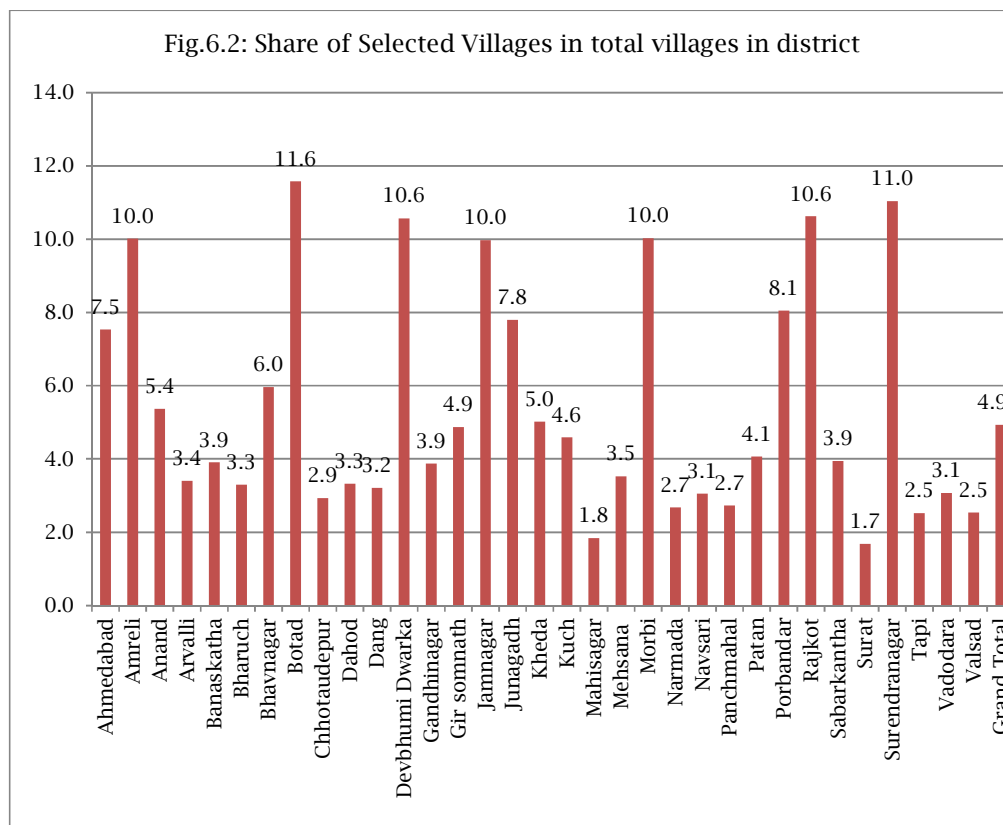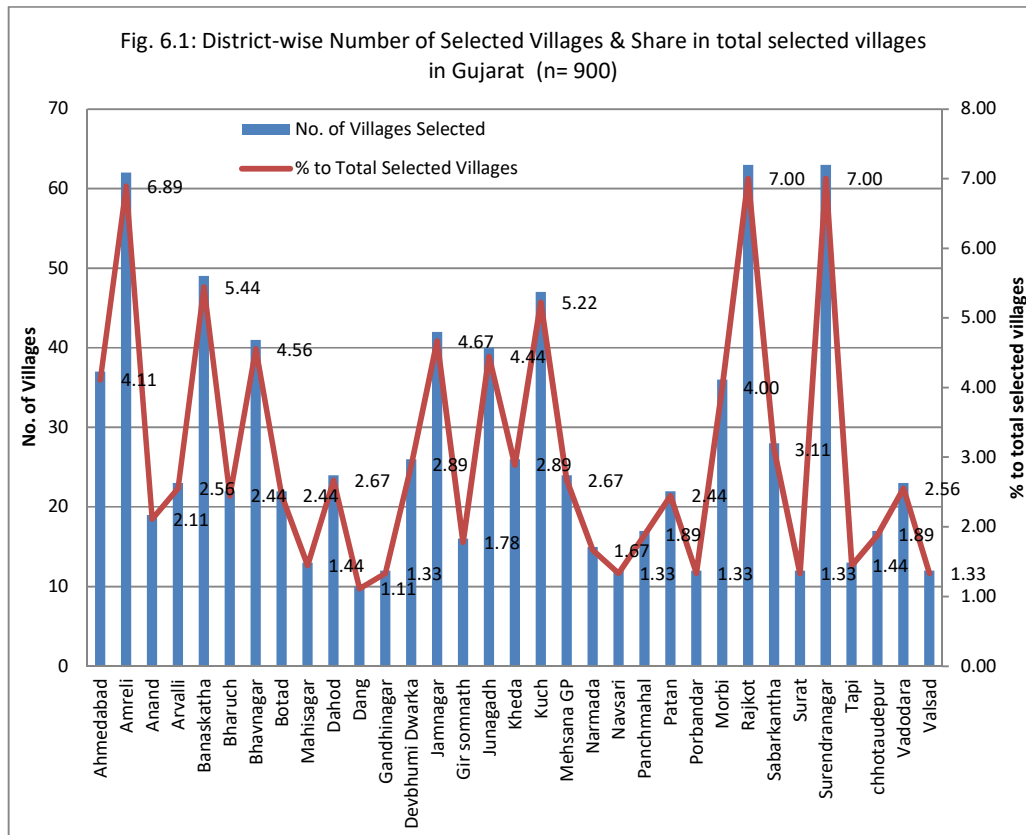
Fig. 6.3 : District-wise Number of Selected Villages & Share in total no of villages in selected district
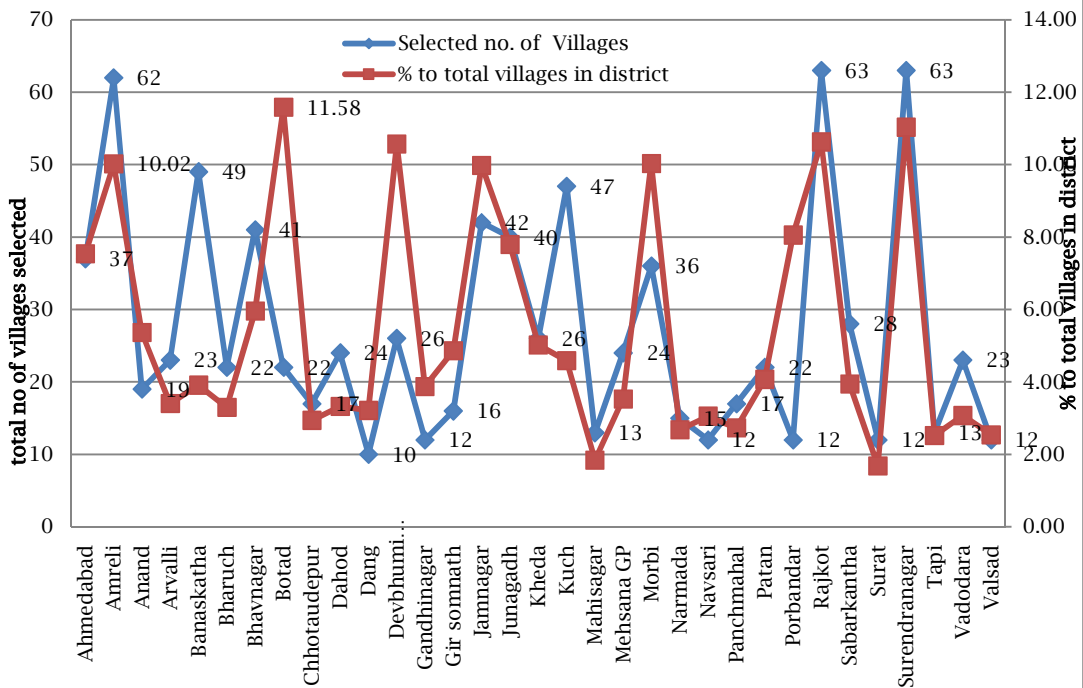
Fig 6.4.: Share of Selected tahsils in total tahsils in district
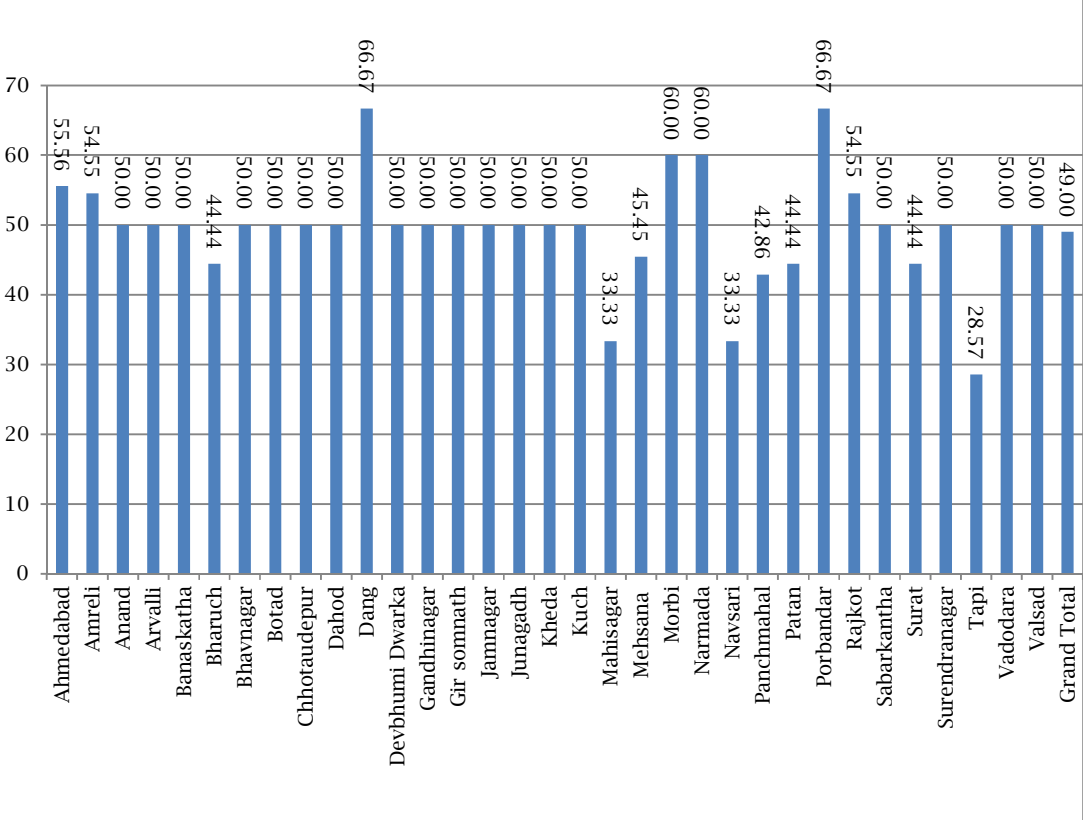
The share of selected tehsils in total number of tehsils selected in each districts are presented in Figure 6.4. It can be seen from the figure that except Tapi, in all other districts, more than one third of the tehsils were got selected in sample. In majority of the cases, half or more than half of total tehsils were got selected. In case of Dang and Porbandar districts, more than two third of the total number of tehsils were selected in sample list, which may be because of less number of tehsils in these districts.

6.5 Average Number of households, Area Cultivated & Soil Type

It can be seen from the Table 6.4 that on average, the number of households in the selected villages was estimated to be 342 households indicates the proper selection of the villages as per methodology adopted having small villages of having area of 1075 hectares and heavily engagement in the agriculture activities. The average number of survey numbers in each village were estimated to be 659 indicates the some of the households have more than one piece of land recorded in land record which may be due to fragmentation of landholding as per Hindu law to the family members. On an average, almost two third of the village land area was under net cultivation.

It can be seen from the table 6.5 that out of 900 villages, majority of the villages had shallow medium black calcareous soils followed by villages having Shallow medium black soils, Sandy and Saline Soils, Deep black, medium black to loamy sand (Goradu) and Sandy loam to sandy soils. The major soil types in districts of Gujarat is presented in Map 6.3.

Table 6.4: Average Number of households and Area Cultivated

Districts	No. of Selected Villages	Average of Total Number of households	Average of Area of village (in hectares/village)	Average of Total Survey No. In Village (Nos./village)	Average of Net Cultivated Area (ha/village)	% of net cultivated area to Area of village
Ahmedabad	37	365	1457	738	1128	77.4
Amreli	62	308	1123	691	882	78.6
Anand	19	891	778	1079	546	70.2
Arvalli	23	144	299	270	214	71.4
Banaskatha	49	287	891	533	641	71.9
Bharuch	22	410	1002	1064	771	76.9
Bhavnagar	41	286	947	516	611	64.5
Botad	22	357	1195	580	848	70.9
Chhotaudepur	17	290	549	316	279	50.7
Dahod	24	298	556	286	260	46.7
Dang	10	132	798	229	284	35.6
Devbhumi Dwarka	26	438	1740	633	1029	59.1
Gandhinagar	12	403	685	780	543	79.2
Gir somnath	16	424	692	609	475	68.6
Jamnagar	42	231	1033	534	632	61.2
Junagadh	40	375	921	583	745	80.8
Kheda	26	578	676	912	477	70.6
Kuch	47	251	2647	495	837	31.6
Mahisagar	13	165	272	270	159	58.4
Mehsana	24	468	797	1097	579	72.7
Morbi	36	306	1414	777	892	63.1
Narmada	15	149	451	271	246	54.6
Navsari	12	394	504	598	300	59.6
Panchmahal	17	463	739	735	333	45.0
Patan	22	307	605	666	470	77.7
Porbandar	12	298	1321	724	819	62.0
Rajkot	63	397	1335	704	994	74.4
Sabarkantha	28	255	519	569	364	70.2
Surat	12	211	695	389	359	51.7
Surendranagar	63	410	1947	1044	1316	67.6
Tapi	13	232	747	301	215	28.8
Vadodara	23	353	598	778	508	85.0
Valsad	12	509	649	1039	410	63.2
Grand Total	900	342	1075	659	697	64.9

Table 6.5: Distribution of Villages as per Soil Type

Soil Type	% of selected villages
Deep black clayey soils	2.9
Deep black poorly drained soils	0.3
Deep black with few parches of coastal alluvial, laterite and medium black soils	3.9
Deep black, medium black to loamy sand (Goradu)	14.0
Medium Black poorly drained soils	4.6
Medium Black soil	0.4
Sandy and Saline Soils	15.8
Sandy loam and sandy soils	5.8
Sandy loam to sandy soils	12.6
Shallow medium black calcareous soils	21.8
Shallow medium black soils	18.0

Map 6.3: Soil Map of Gujarat
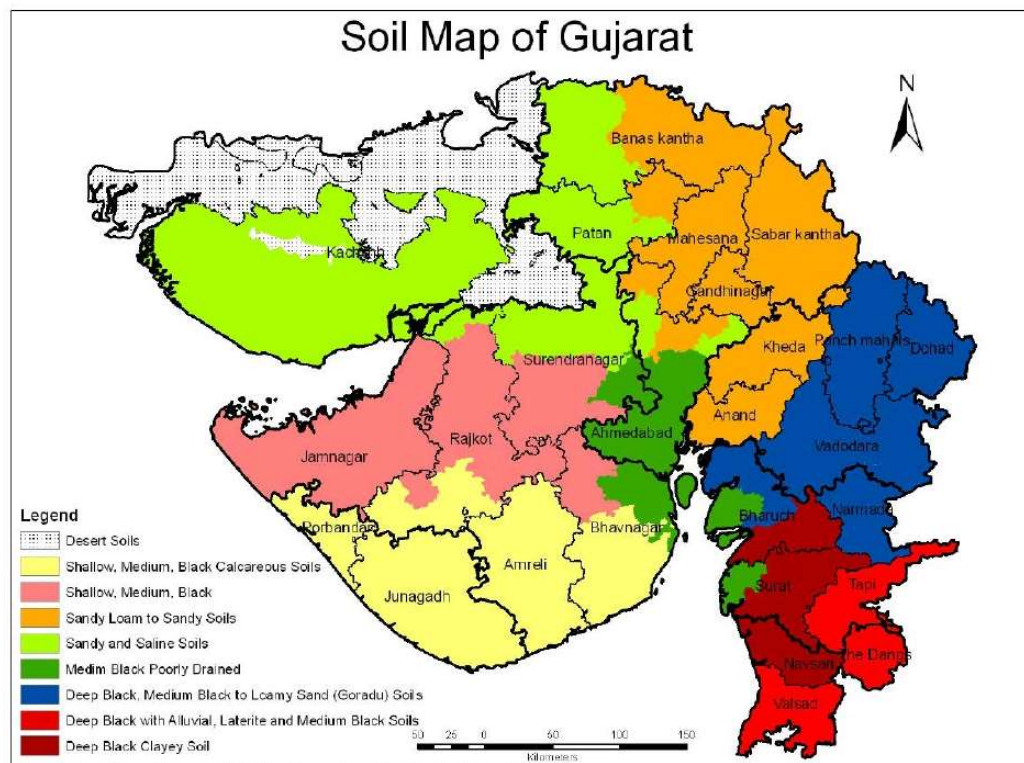
Source: Based on data provided by Department of Agriculture, Gujarat

6.6 Facilities Available in and around Village:

The details on facilities available in and around the villages are presented in Table 6.6. It can be seen from the table that as was

expected that the majority of the selected villages in Gujarat were connected with the pacca road having electricity connection in the villages. While easy approachable bank availability was also another feature of most of the selected villages. Mix picture was observed in case of input market and output marketing facility available for sale of produce in or around the village, particularly selected villages in tribal area were not having such facilities close to their village.

Table 6.6: Details on Facilities Available in Villages

Sr. No.	District	Pacca road connected to main road (Yes)	Electricity in the village (Yes)	Bank in or around (easily approachable) the village (Yes)	Marketing facility for sale of produce in or around (easily approachable) the village (yes)	Agricultural input facility in or around the village (seed, fertilizer, insecticide, pesticide etc.) (Yes)
1	Ahmedabad	97.30	100.00	78.38	62.16	59.46
2	Amreli	96.77	98.39	85.48	85.48	90.32
3	Anand	94.74	94.74	84.21	84.21	89.47
4	Arvalli	100.00	100.00	100.00	100.00	95.45
5	Banaskantha	95.92	95.92	67.35	63.27	67.35
6	Bharuch	100.00	100.00	100.00	100.00	95.45
7	Bhavnagar	95.12	100.00	97.56	80.49	80.49
8	Botad	100.00	100.00	90.91	90.91	90.91
9	Chhotaudepur	82.35	100.00	52.94	58.82	64.71
10	Dahod	100.00	100.00	91.67	83.33	83.33
11	Dang	100.00	100.00	10.00	10.00	0.00
12	Devbhumi Dwarka	100.00	100.00	61.54	38.46	65.38
13	Gandhinagar	100.00	100.00	66.67	50.00	50.00
14	Gir somnath	93.75	100.00	81.25	56.25	87.50
15	Jamnagar	83.33	100.00	52.38	38.10	42.86
16	Junagadh	100.00	100.00	72.50	45.00	50.00
17	Kheda	96.15	96.15	80.77	69.23	65.38
18	Kuch	89.36	97.87	74.47	74.47	78.72
19	Mahisagar	100.00	100.00	100.00	100.00	100.00
20	Mehsana GP	100.00	100.00	95.83	95.83	95.83
21	Morbi	97.22	100.00	36.11	16.67	25.00
22	Narmada	86.67	86.67	66.67	73.33	66.67
23	Navsari	83.33	100.00	58.33	41.67	41.67
24	Panchmahal	88.24	88.24	70.59	82.35	70.59
25	Patan	95.45	100.00	59.09	59.09	59.09
26	Porbandar	91.67	91.67	33.33	25.00	41.67
27	Rajkot	100.00	100.00	87.30	84.13	90.48
28	Sabarkantha	100.00	92.86	82.14	78.57	78.57
29	Surat	95.24	100.00	63.49	20.63	44.44
30	Surendranagar	76.92	84.62	38.46	38.46	38.46
31	Tapi	66.67	100.00	25.00	33.33	33.33
32	Vadodara	100.00	100.00	83.33	91.67	91.67
33	Valsad	100.00	100.00	86.96	78.26	82.61

Except the selected villages from Bharuch, Dang, Mahisagar and Kuchch districts, villages in other districts were relatively close to block/tehsil place (table 6.7).

Table 6.7: Distance of Selected Villages from nearby Block/District

Sr. No.	District	Distance and direction from CD block to village and mode of transport /	Distance from Taluk/Tehsil/Circle to village and mode of transport	Distance from district head quarter to village and mode of transport
1	Ahmedabad	17.93	18.73	75.81
2	Amreli	14.80	17.13	36.32
3	Anand	15.72	16.05	30.53
4	Arvalli	13.10	13.52	19.19
5	Banaskatha	13.61	13.90	38.16
6	Bharuch	86.00	144.00	253.00
7	Bhavnagar	16.22	16.41	48.32
8	Botad	15.91	15.95	24.05
9	Chhotaudepur	14.41	14.41	44.65
10	Dahod	13.42	13.50	50.88
11	Dang	22.40	22.40	43.40
12	Devbhumi Dwarka	18.65	18.65	36.38
13	Gandhinagar	10.33	11.25	37.00
14	Gir somnath	14.00	13.88	58.94
15	Jamnagar	20.00	21.21	50.10
16	Junagadh	12.85	12.30	42.48
17	Kheda	13.65	14.00	25.92
18	Kuch	38.23	40.81	105.79
19	Mahisagar	24.38	24.23	35.62
20	Mehsana GP	15.13	15.13	33.54
21	Morbi	17.14	17.69	34.22
22	Narmada	12.47	14.67	32.20
23	Navsari	11.17	11.17	60.83
24	Panchmahal	6.59	10.88	21.88
25	Patan	14.18	14.18	24.05
26	Porbandar	10.67	18.50	35.58
27	Rajkot	14.02	14.02	58.98
28	Sabarkantha	11.75	18.00	30.36
29	Surat	16.24	16.65	34.98
30	Surendranagar	11.15	10.69	38.62
31	Tapi	15.83	19.00	40.50
32	Vadodara	13.50	13.67	63.67
33	Valsad	14.78	15.22	37.04

The next chapter presents the observations during field survey and executing the crop cutting experiments.

Observations during Field Survey & Executing CCEs

7.1 Introduction

As mentioned in earlier chapters, survey was conducted in 900 villages for area estimated for 2 seasons and 5400 CCEs during AY 2016-17, though survey was conducted 900 villages surveyed in both seasons, total 5321 CCEs were conducted. Some of the observations during field survey and executing the crop cutting experiments are presented and discussed in this chapter.

7.2 Field Observations:

As the state agency was unable to carry out the project work due to staff shortage and other commitment and therefore field work could not be started in Gujarat during AY 2015-16. Then the work was assigned to our AERC and the work was carried out during AY 2016-17. Since for the first time, AERC has been engaged in AE and CCE, several trainings were organized with the help of Agriculture Department of Gujarat and NSSO. Due to paucity of staff, we had engaged local persons for data collection at village level. However, entire supervision, co-ordination, data entry etc. were done by the regular staff of the Centre.

Few observations from field:

- Though most of the farmers were cooperative, few farmers were not allowing field staff to enter in to the field as they argue that crop gets disturbed/damaged. As there was not substitution permitted for village as well as selected survey numbers, we had to pursue the selected farmer for selected CCEs. After continuous follow- up, somehow field staff managed to conduct the CCEs.

- In few cases, harvest of whole crop on selected plot was done by farmers, thus output of the entire field was recorded and yield for plot size under study was calculated.
- In few cases, respondents were not cooperative to provide the necessary information. So field staff had to pursue the selected respondent for the same.
- Due to some family conflicts, the 5×5 plot demarcations were removed frequently.
- In some selected villages in Saurashtra region of Gujarat, Cotton is the only crop sown during Kharif season by selected 100 survey numbers.
- Selected Village with Sole Crop, Fodder, no crop grown during crop season
- In four selected villages in Kutch region of Gujarat, no agriculture crop was sown during Kharif season of 2016.
- In some villages, only one food grain/oilseed crop was sown by selected 100 survey numbers.
- Farmers expressed hurriedness/ bored due to very large number of questions asked to them. This created difficulties in deriving the key inputs from of them which are relevant for the CCE experiments.

7.3 Problems encountered:

While conducting the field work, data entry and analysis of data for all the districts of Gujarat, several problems are encountered. Few of those major problems and observations are highlighted as followed,

- One of the major problems encountered while conducting the survey as per recommendations lay out by Professor Vaidyanathan Committee Report is major crops. As per committee's recommendation, the pilot project aimed at

generating only state and national level estimates but as per request of the sponsoring agency the objective was changed to produce district level area and yield estimates of major crop. The main problem encountered was the major crops at district level may not be the same as major crops at state level. At state level, wheat is treated as major crop but in many districts cotton and groundnut was found occupying most of the selected survey numbers in our study. As per PMC recommendations, only major food grain crops are to be considered in the study so many cash and other major crops at the district level got ignored and also covering all the crops are beyond the scope of the study as the budget is allocated only for 3 crops at state level (2 in Kharif and 1 in Rabi).

- As our staff is mainly involved in field survey for research studies and cost of cultivation surveys, and therefore, to execute the project in proper manner, several training programmes were organised for the staff of the Centre. However, staff of associated institutions could not match up with the same and thus initially faced the problem in conduct of the CCEs.

- One issue frequently raised by the field staff was the difficulties in conducting CCE. CCE requires high level cooperation and coordination between at least three agencies, viz. farmers, state agency like patwaris and data collectors. It requires multiple visits for selection, identification, fixing dates for harvest, harvesting etc. It is always uncertain to fulfil all these engagements. It also requires special equipment and specific skill. Over the years, there are shortcomings in these requirements in general and tremendous reluctance on the part of farmers for some valid reasons in particular. There are other technical problems as well. The plot for CCE is selected

randomly and thereby falls anywhere in the field, need not be in the corner or boundary. As a result, it is difficult to keep a small plot separately for harvest. It is also likely to damage nearby crop. It is more difficult with the introduction of mechanization of harvesting, thrashing etc. The number of CCEs is also increasing to a large extent as demand of yield estimates at disaggregate level is also increasing. Therefore, lot of compromise has to be made in the field. These definitely give rise to doubt about its efficacy and quality of data generated through CCEs. It is high time to explore some alternative methodology to generate yield estimates by using modern technology. Although, Remote Sensing technique is being in use for quite some time, results are not very encouraging, especially in the case of yield estimation.

▸ Though most of the farmers were cooperative, few farmers were not allowing our field staff to enter in to the field as they argue that crop gets disturbed/damaged. After continuous follow-up, somehow field staff managed to conduct the CCEs.

▸ In few cases, harvest of whole crop on selected plot was done by farmer/s, thus we recorded particular plot output and calculated yield for plot size under study.

▸ In few cases, respondents were not cooperative to provide the necessary information as well as reluctant to permit us to plot CCE in selected plot area. As there was not substitution permitted for village as well as selected survey number, we had to pursue the selected farmer for selected CCEs.

▸ For about 35 villages, no land data was available on GOG website (https://anyror.gujarat.gov.in/). Thus, we have used land record available at selected villages, then we selected 100 survey numbers and then done census of same and subsequent crop and plot selection.

- ➢ Few selected Survey villages were with less than 100 survey numbers (Ahmedabad region- 04 villages; Vadodara region- 22 villages)

- ‣ The data collection is done by the field staff (experiment basis/contract basis) and thus we had to depend on them for accuracy and timeliness of data sets. Despite of training provided to them on field, field staff has tendency to look for another work while conducting present work, which has negative impact on data sets. Therefore, work of CCE should be undertaken from the permanent staff of any research institute or organization so that we can track and get it correct data if any mistake found in later stage in recording data.

- ‣ Initially there was wide variation between Longitude and Latitude recorded in MAPI Software and WhatsmyGPS.com. Even same village has reported different GPS in MAPI software. IASRI noted the submission and provided the solution for data collection though MAPPI.

- ‣ Since the survey numbers were not updated in land records of some districts, the records didn't match the field level situation. It was very difficult to trace the actual farmer/s of the selected plot. As a result, we had to put lot of efforts to reach the right plot as per sampling.

- ‣ There were a large number of dates mentioned in the schedules which farmers could not recall exactly, at some cases.

- ‣ It was felt that information on driage experiment may not be required for this pilot study.

(a) Data entry problems, if any

i) Due to relatively lengthy schedules, the field investigators were confused due to similar information appearing at many places of the schedules. They were of opinion that so many

information/options in the schedules are not relevant for the CCE experiments. But they took more time and created confusion.

ii) In some cases, units of measurement were not mentioned. As a result, multiple units were used by the field staff, which made a difficult situation for supervisors and computer staff to rectify the data set and enter the date correctly.

iii) Preliminary village level information were repeated in Schedule I and II. Same data were needed to be entered twice. It was suggested to improve the software in such a manner that, once it is entered in one place, it should appear in other required locations.

7.4 Chapter Summary:

The field observations experienced during the field survey and executing the crop cutting experiments are presented in this chapter. All the issues related to schedules, data imputing, MAPPI software were solved by the IASRI, New Delhi on the discussion with them, while issues related to on field were handled and settled by the field staff in consultation with project coordinators at the Centre.

Results and Recommendations

8.1 Introduction

The data collected were analyzed and are presented in this chapter and suitable policy implications are drawn from the results and discussions. The estimates generated by IASRI are presented and discussed in this chapter.

8.2 Distribution of Selected Crops

The details on distribution of crops in total CCEs are presented in Table 8.1. It can be seen from the table that wheat was the major crop got selected for crop cutting experiments covering one fourth of total crop cutting experiments conducted in the State as it was grown by most of the farmers in Gujarat. Groundnut, bajra, tur and paddy were another major crops cultivated by the selected farmers. The other crops cultivated by the farmers were jowar, mung, maize, sesamum, urad, R&M, gram, and moth, while 1.2 per cent of households had not grown any crop on selected survey area.

Table 8.1: Distribution of Selection of Crops

Row Labels	No. of CCEs	% to Total
Bajra	605	11.2
Gram	170	3.1
Groundnut	828	15.3
Jowar	107	2.0
Maize	241	4.5
Moth	8	0.1
Mung	319	5.9
No Crop	64	1.2
Paddy	441	8.2
R & M	70	1.3
Sesamum	335	6.2
Sorghum	18	0.3
Tur	522	9.7
Urad	253	4.7
Wheat	1419	26.3
Grand Total	5400	100.0

The districtwise details on crops grown in selected villages are presented in table 8.2. The crops sown during the early and late kharif season were paddy, jowar, bajara, maize, tur, moog, urad cotton and fodder crops. Wheat, gram, tobacco, castor and fodder crops were sown during rabi season while summer paddy, bajra and fodder crops were grown.

Table 8.2: District-wise Season-wise details on Crops Grown

Sr. No.	District	Early Kharif crop	Late Kharif crop	Rabi (Winter) crop	Zaid (Summer) crop
1	Ahmedabad	Urad, Mung, Bajra, Cotton	Paddy, Mung, Sesamum, Fodder, Castor, Cotton, Tur	Wheat, Gram, Cumin	Bajra
2	Amreli	Sesamum, Groundnut, Bajra, Tur	Ground Nut, Jowar, Sesamum, Cotton, Tur	Gram Wheat Cumin	Bajra
3	Anand	Paddy ,Bajra	Paddy, Bajra, Fodder, Vegetables	Wheat, Tabaco	Paddy, Bajra
4	Arvalli	Bajra, Jowar, Urad, Cotton, Tur	Bajra, Urad, Maize, Cotton, Tur	Wheat, Rapeseed & Mustard	Bajra
5	Banaskantha	Bajra, Sesamum, G. Nut	Groundnut, Bajra, Sesamum, Potato, Urad, Tur, Moong	Mustard, Wheat, Castor, Gram	Bajra
6	Bharuch	Tur, Cotton, Sugarcane, Moong	Cotton, Tur, Sorghum	Wheat, Mustard, Moong, Sorghum	
7	Bhavnagar	Cotton, Sorghum Fodder	Groundnut, Sesamum, Mung, Cotton, Fodder, Vegetables, Bajra	Wheat, Gram, Fodder	Fodder
8	Botad	Sesamum, Sorghum	Cotton, Sesamum, Groundnut, Moong, Bajra	Wheat, Gram	Sorghum
9	Chhotaudepur	Maize, Cotton, Fodder, Tur	Maize, Tur, Paddy	Maize, Rapeseed Mustard	Fodder
10	Dahod		Maize, Paddy, Tur	Maize, Wheat	
11	Dang	Paddy, Tur, Nagli, Urad	Tur, Urad	Gram	Paddy
12	Devbhumi Dwarka	Groundnut, Mung, Sesamum	Groundnut, Mung, Sesamum	Wheat, Cumin, Fodder	
13	Gandhinagar	Cotton, Moong, Urad, Groundnut	Sesamum, Jowar, Cotton, Urad, Castor, Bajra, Groundnut	Wheat, Gram	
14	Gir somnath	Bajra, Jowar, Urad, Sesamum	Bajra, Cotton, Groundnut	Wheat, Gram	
15	Jamnagar	Groundnut, Moong, Jowar, Cotton	Ground Nut, Sesamum, Urad, Tur	Wheat, Gram, Cumin	
16	Junagadh	Groundnut, Tur, Sorghum, Soybean	Groundnut, Cotton, Tur	Wheat, Gram, Coriander	Sorghum

Table 8.2 continues….

Sr. No.	District	Early Kharif crop	Late Kharif crop	Rabi (Winter) crop	Zaid (Summer) crop
17	Kheda	Paddy, Bajra	Bajra, Paddy, Jowar, Vegetable, Fodder	Wheat, Jowar, Bajra, Tabaco	Paddy
18	Kuch	moong, Sesamum, Groundnut, bajra, Jowar	Bajra, Jowar, Mung, Urad, Mod, Groundnut, Sesamum, Castor, R & M, Black gram, Guar, Cotton, Vegetable, Fodder	Wheat, R & M, Cumin, Fodder	bajra, Jowar
19	Mahisagar	Fodder	Paddy, Maize Fodder, Groundnut, Soybean, Moong, Fodder	Wheat, Maize, Gram, Fodder Maize	Fodder
20	Mehsana GP		Bajra, Mung, Urad, Cotton, Vegetables, Castor, Fodder	Wheat, Rape & Mustard, Fennel	
21	Morbi		Bajra, Sesamum, Tur, Groundnut, Urad, Cotton	Wheat, Gram, Coriander, Cumin	
22	Narmada	Tur	Bajra, Tur	Wheat, Maize	Tur
23	Navsari	Paddy Seedling	Paddy, Tur, Jowar, Sugarcane, Jowar Fodder	Wheat, Gram	Paddy Seedling
24	Panchmahal	Maize, Paddy, Tur, Urad, Groundnut, Bajra	Paddy, Maize, Bajra, Fodder, Tur	Wheat, Gram, Maize, Fodder	Paddy, Bajra
25	Patan	Bajra, Urad, Moong, Groundnut, Guwar		Wheat, Rapeseed-Mustard, Cumin	Bajra
26	Porbandar		Groundnut, Urad, Moong, Tur, Jowar	Wheat, R & M, Tur, Moong, Sesamum,	
27	Rajkot	Groundnut, Tur	Groundnut, Tur, Urad, Cotton, Sesamum, Black gram, Vegetable,	Wheat, Gram, Coriander, Cumin	
28	Sabarkantha	Tur, Cotton	Bajra, Maize, Tur, Urad, Jowar, Groundnut	wheat, rapeseed mustard	
29	Surat	Urad, Jowar, Cotton, Castor, Sesamum, G. nut	Sesamum, Jowar, Urad, Moong, Paddy, Bajra,	Wheat, Cumin, Sesamum, Mustard	Jowar
30	Surendranagar	Paddy , Tur , Jowar	Paddy, Groundnut, Tur, Jowar, Cotton, Moong,	Wheat, Sugarcane	Paddy
31	Tapi	Paddy, Tur, Sugarcane	Paddy, Tur, Sugarcane	Wheat, Gram	Paddy
32	Vadodara	Jowar, Paddy, Urad, Tur, Cotton, Groundnut, Sugarcane	Wheat, Sugarcane	Sugarcane, Wheat, Gram, Urad	Jowar, Paddy
33	Valsad	Sugarcane, Paddy Seedling, Fodder	Paddy, Bajra, Tur, Cotton, Sugarcane, Castor, Fodder, Vegetable	Wheat, Maize, Sugarcane, Tabacco	Paddy Seedling, Fodder

Source: Field survey data.

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8.3 Average age and Education of Selected Respondents

The details on average age and education of selected respondents are presented in Tables 7.3 which indicates that on an average the age of the selected farmer household was estimated to be 51 years which was almost same in both the cases. Same the case of average education of cultivators which was estimated to be 6.6 years across crops.

Table 8.3: Details on Average Age and Education of Selected Paddy Growers

Sr. No.	District	Age (years)			Education (years)		
		Average	Male	Female	Overall	Male	Female
1	Paddy	52.1	52.7	51.1	6.2	6.1	6.3
2	Bajra	49.5	49.6	50.4	6.9	6.9	6.2
3	Jowar	55.0	55.1	52.7	6.8	7.0	6.5
4	Maize	47.8	48.6	52.7	6.7	7.1	6.8
5	Moong	47.5	48.8	47.6	6.7	6.7	6.6
6	Urad	51.7	51.9	52.9	6.3	6.4	6.1
7	Tur	51.0	50.9	50.7	7.2	7.2	6.1
8	Groundnut	50.4	52.2	48.9	6.7	6.9	6.8
9	Sesamum	50.6	51.4	49.6	7.1	7.0	6.7
10	Wheat	51.6	52.4	50.1	6.7	6.9	5.7
11	Gram	51.6	52.2	49.5	6.2	6.4	6.2
12	Rapeseed Mustard	54.7	56.1	53.5	5.1	5.2	5.0
	Av.	**51.1**	**51.8**	**50.8**	**6.6**	**6.6**	**6.3**

Source: Field survey data.

Table 8.4: District-wise sample household Age and Education

Sr. No.	District	Age (years)			Education (years)		
		Male	Female	Overall	Male	Female	Overall
1	Ahmedabad	50.29	49.03	50.13	7.82	6.93	7.7
2	Amreli	50.13	50.03	50.12	5.25	4.03	5.11
3	Anand	52.99	49.03	51.84	8.43	8.13	8.37
4	Araveli	50.10	46.55	49.59	8.1	6.89	7.91
5	Banaskantha	53.82	52.29	53.67	6.3	5.81	6.25
6	Baruch	52.88	59.23	53.51	9.26	6	8.98
7	Bhavnagar	49.47	54.56	50.41	8.12	7.67	8.07
8	Botad	54.13	55.67	54.34	6.84	6.71	6.83
9	Chhota Udepur	54.64	57.5	55.37	7.24	5.6	7.11
10	Dahod	51.45	46	51.42	7.59	8.0	7.59
11	Dang	54.06	52.83	53.57	8.0	8.0	8.0
12	Devbhumi Dwarka	50.37	48.31	50.03	7.43	8.2	7.47
13	Gandhinagar	49.17	35	42.08	8.08	10	9.03
14	Gir Somnath	48.78	43.58	47.75	7.46	7.67	7.49
15	Jamnagar	54.02	52.33	53.86	9.67	10.8	9.75
16	Junagadh	51.62	55.24	52.13	7.8	8	7.82
17	Katch	50.6	49.89	50.49	7.52	7.9	7.57
18	Kheda	56.17	50.23	54.88	9.33	8.23	9.08
19	Mahisagar	58.44	68.33	59.21	9.49	8.2	9.39
20	Mahsana	52.67	51.55	52.44	6.41	5.76	6.29
21	Morbi	53.41	56.86	53.99	6.15	8.25	6.36
22	Narmada	51.7	51.19	51.61	8.52	6.5	8.19
23	Navsari	49.5	43	47.33	7.58	8	7.7
24	Panchmahal	56.3	52.5	56.08	8.35	9.5	8.41
25	Patan	52.63	53.11	52.7	6.03	5	6
26	Porbander	45.76	47	45.93	8.18	8.75	8.25
27	Rajkot	57.12	56.38	57.02	8.59	7.4	8.44
28	Sabarkantha	46.27	47.73	46.59	9.28	8.86	9.18
29	Surat	52.83	46.37	51.13	8.8	8.75	8.8
30	Surendranagar	43.25	40.5	42.77	8.67	9.24	8.77
31	Tapi	53.96	53.11	53.65	6.07	8.67	6.85
32	Vadodara	52.68	51.39	52.34	7.69	9.21	8.05
33	Valsad	47.96	45.27	47.4	8.0	8.0	8.0

Source: Field survey data.

8.4 District-wise Estimates of Total Area & Yield (IASRI estimates)

The crop-wise state level estimates are presented in Fig. 8.1 which indicate that the yield level of paddy crop was estimated to be 35.86 quintals per hectare, 27.35 quintals per hectare inbajra crop, 19.91 quintals per hectare of groundnut crop, 19 quintals per hectare in tur, 13.12 quintals per hectare for maize and around 8.5-8.5 quintals per hectare in case of mung and sesamum crop. While variation in area coverage across crops was estimated to be between 30-40 percent while yield variation was estimated to be highest of between 15-16 per cent in pulse crops (tur and mung) followed by in case of urad crop (9.3%). The lowest range of variation was estimated in groundnut crop.

Fig. 8.1: State level Estimates
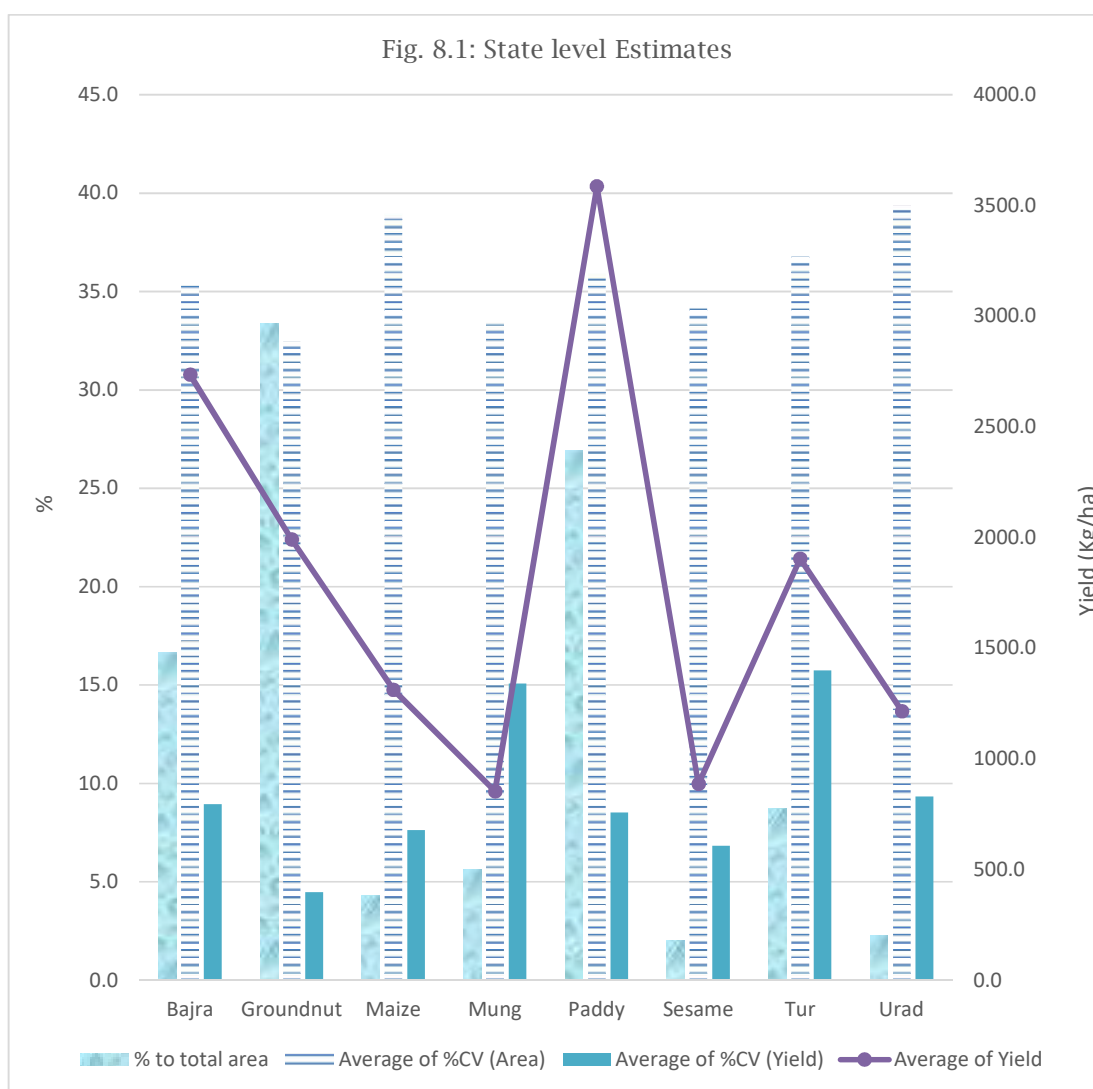
The district-wise estimates of total area and yield under different major food grain crops in Gujarat were calculated along with CV and are presented in Tables 8.5 and 8.12 for kharif crops and in Tables 8.13 to 8.18 for rabi crops. It can be seen from the tables that the variation in area was estimated to very high as compared to productivity level with exceptions of few cases.

Table 8.5: Districtwise Area and Yield Estimates of Paddy Crop

Sr. No.	District	Crop	Area	%CV (Area)	Yield	%CV (Yield)
1	Ahmedabad	Paddy	245	29.74	4459	7.51
2	Anand	Paddy	189	24.75	3559	3.3
3	Chhotaudepur	Paddy	22	64.56	2259	14.11
4	Dahod	Paddy	54	12.05	2189	1.59
5	Dang	Paddy	24	28.07	2118	12.17
6	Gandhinagar	Paddy	17	70.91	3683	11.7
7	Kheda	Paddy	127	33.75	5113	2.60
8	Mahisagar	Paddy	129	42.27	2948	6.49
9	Navsari	Paddy	56	34.64	3065	8.42
10	Panchmahal	Paddy	9	37.70	2858	5.17
11	Surat	Paddy	89	53.81	7713	38.89
12	Tapi	Paddy	87	28.57	3217	1.85
13	Vadodara	Paddy	63	27.79	3574	1.93
14	Valsad	Paddy	95	13.75	3451	3.63

Table 8.6: Districtwise Area and Yield Estimates of Bajra Crop

Sr. No.	District	Crop	Area	%CV (Area)	Yield	%CV (Yield)
1	Anand	Bajra	73	62.78	2806	2.5
2	Arvalli	Bajra	96	25.67	3128	1.71
3	Banaskantha	Bajra	154	20.44	3824	41.22
4	Bhavnagar	Bajra	33	26.06	2368	1.91
5	Botad	Bajra	12	57.94	2387	2.08
6	Gandhinagar	Bajra	11	85.03	2225	12.95
7	Gir Somnath	Bajra	26	15.95	4025	1.94
8	Mehsana	Bajra	230	20.96	3207	6.79
9	Patan	Bajra	43	33.61	1721	13.61
10	Sabarkantha	Bajra	43	27.03	2457	2.97
11	Surendranagar	Bajra	25	13.11	1938	10.61

Table 8.7: Districtwise Area and Yield Estimates of Maize Crop

Sr. No.	District	Crop	Area	%CV (Area)	Yield	% CV (Yield)
1	Chhotaudepur	Maize	23	33.67	1269	7.41
2	Dahod	Maize	103	11.13	1452	6.75
3	Mahisagar	Maize	52	20.8	1099	7.53
4	Panchmahal	Maize	15	90.19	1429	8.87

Table 8.8: Districtwise Area and Yield Estimates of Mung Crop

Sr. No.	District	Crop	Area	%CV (Area)	Yield	% CV (Yield)
1	Ahmedabad	Mung	39	34.06	908	51.05
2	Devbhumi Dwarka	Mung	46	45.88	643	3.28
3	Mehsana	Mung	159	28.92	801	2.67
4	Surendranagar	Mung	9	24.87	1061	3.31

Table 8.9: Districtwise Area and Yield Estimates of Urad Crop

Sr. No.	District	Crop	Area	%CV (Area)	Yield	% CV (Yield)
1	Devbhumi Dwarka	Urad	22	54.92	650	7.6
2	Jamnagar	Urad	5	63.86	855	4.31
3	Jamnagar	Tur	13	55.31	1110	6.98
4	Morbi	Urad	22	34.52	1355	4.92
5	Patan	Urad	40	13.11	1458	5.21
6	Surendranagar	Urad	13	30.42	1761	24.62

Table 8.10: Districtwise Area and Yield Estimates of Tur Crop

Sr. No.	District	Crop	Area	%CV (Area)	Yield	% CV (Yield)
1	Bharuch	Tur	140	20.61	1201	2.68
2	Chhotaudepur	Tur	24	28.07	1006	5.29
3	Dang	Tur	2	39.46	1377	2.2
4	Jamnagar	Tur	13	55.31	1110	6.98
5	Narmada	Tur	25	48.33	1016	2.9
6	Sabarkantha	Tur	60	34.72	1302	47.22
7	Surat	Tur	53	35.93	6991	56.37
8	Vadodara	Tur	75	31.82	1229	2.3

Table 8.11: Districtwise Area and Yield Estimates of Groundnut Crop

Sr. No.	District	Crop	Area	%CV (Area)	Yield	%CV (Yield)
1	Amreli	Groundnut	131	37.93	1610	5.23
2	Banaskantha	Groundnut	143	31.12	2497	7.85
3	Bhavnagar	Groundnut	44	38.81	2637	2.38
4	Botad	Groundnut	10	56.78	1542	1.42
5	Devbhumi Dwarka	Groundnut	216	11.36	3752	2.03
6	Gandhinagar	Groundnut	6	80.67	1907	13.15
7	Jamnagar	Groundnut	147	11.97	1647	2.67
8	Junagadh	Groundnut	319	9.05	1694	1.99
9	Kachchh	Groundnut	253	29.78	1645	4.85
10	Porbandar	Groundnut	71	30.18	2246	4.53
11	Rajkot	Groundnut	146	17.51	1007	3.97
12	Surendranagar	Groundnut	9	34.45	1711	3.47

Table 8.12: Districtwise Area and Yield Estimates of Sesamum Crop

Sr.No.	District	Crop	Area	%CV (Area)	Yield	%CV (Yield)
1	Ahmedabad	Sesame	4	65.72	706	2.06
2	Bhavnagar	Sesame	26	15.95	956	8.04
3	Botad	Sesame	15	25.78	765	5.31
4	Jamnagar	Sesame	4	54.34	800	19.69
5	Surendranagar	Sesame	27	19.68	1093	4.15

During the rabi season, wheat was the only crop was grown by the all the selected farmers of the selected sample households of selected villages of Gujarat, while gram crop was grown by selected respondents of only nine districts only. However, maize crop was grown in only three districts, while only one district was reported coverage of mung, rapeseed mustard and sasamum crop. It is very important to see limitation of coverage of crops which further limit the estimation of crop yield at district and state level.

Table 8.13: Districtwise Area and Yield Estimates of Wheat Crop

Sr. No.	District	Crop	Area	%CV (Area)	Yield	%CV (Yield)
1	Ahmedabad	Wheat	187	33.34	3254	5.63
2	Amreli	Wheat	72	19.91	3224	4.6
3	Anand	Wheat	132	37.13	3376	3.58
4	Arvalli	Wheat	88	25.05	3300	1.71
5	Banaskantha	Wheat	174	22.12	3580	4.23
6	Bharuch	Wheat	10	25.47	1756	7.73
7	Bhavnagar	Wheat	61	17.09	2976	2.17
8	Botad	Wheat	24	9.54	3312	1.37
10	Dahod	Wheat	72	21.75	2240	6.04
12	DevbhumiDwarka	Wheat	68	16.37	10464	5.5
13	Gandhinagar	Wheat	55	19.54	2676	5.97
14	GirSomnath	Wheat	43	21.41	4560	2.11
15	Jamnagar	Wheat	35	34.52	2144	12.39
16	Junagadh	Wheat	167	22.4	4600	2.94
17	Kheda	Wheat	154	22.59	4480	2.33
18	Kachchh	Wheat	37	22.2	3220	6.14
19	Mahisagar	Wheat	115	36.75	3080	0.94
20	Mehsana	Wheat	290	23.26	3960	2.39
21	Morbi	Wheat	102	31.72	3760	5.77
22	Narmada	Wheat	31	75.96		
23	Navsari	Wheat	34	21.24	2996	1.84
24	Panchmahal	Wheat	85	44.86	2304	14.08
25	Patan	Wheat	56	16.64	3940	2.83
26	Porbandar	Wheat	19	19.38	2428	10.13
27	Rajkot	Wheat	43	27.2	4435	5.38
28	Sabarkantha	Wheat	179	27.76	3156	2.87
29	Surat	Wheat	19	29.84	9528	41.22
30	Surendranagar	Wheat	92	13.02	3032	1.68
31	Tapi	Wheat	16	35.32	4152	2.79
32	Vadodara	Wheat	38	34.09	3957	15.05
33	Valsad	Wheat	65	19.06	2985	1.13

Table 8.14: Districtwise Area and Yield Estimates of Gram Crop

Sr. No.	District	Crop	Area	%CV	Yield	%CV
1	Amreli	Gram	32	36.36	1536	
2	Bhavnagar	Gram	15	25.07		
3	Dahod	Gram	40	20.18		
4	Dang	Gram	15	31.52	1332	9.02
5	Jamnagar	Gram	37	28.55	1876	7.9
6	Mahisagar	Gram	39	25		
7	Morbi	Gram	27	41.49	2024	26.3
7	Navsari	Gram	22	43.08		
8	Porbandar	Gram	10	58.29	1876	
9	Rajkot	Gram	56	44.48	1822	10.07

Table 8.15: Districtwise Area and Yield Estimates of R&M Crop

Sr. No.	District	Crop	Area	%CV	Yield	%CV
1	Banaskantha	Rape &Mustard	73	20.63	1442	14.9

Table 8.16: Districtwise Area and Yield Estimates of Maize Crop

Sr. No.	District	Crop	Area	%CV	Yield	%CV
1	Chhotaudepur	Maize	27	42.27	2304	5.68
2	Narmada	Maize	13	28.61	2356	5.95
3	Vadodara	Maize	76	34.93	4140	19.34

Table 8.17: Districtwise Area and Yield Estimates of Sesamum Crop

Sr. No.	District	Crop	Area	%CV	Yield	%CV
1	Kheda	Sesame	55	66.14		

Table 8.18: Districtwise Area and Yield Estimates of Mung Crop

Sr. No.	District	Crop	Area	%CV	Yield	%CV
1	Porbandar	Mung	48	67.85	#	#

#No data received

Professor Vaidyanathan Committee recommended a smaller sample, around 2 per cent of total villages, to generate area, yield & production estimates at state and national level. This project adopted same sample size, but attempted to generate district level estimates as requested by DES.

- The problem of small sample became more acute as only 100 survey numbers in each selected village was covered instead of complete enumeration of the village.
- Effectively, sample fraction becomes less than 1 per cent. As a result, many of the crops were either missed or less number of observations was available.

- This project was also intended to cover only major food grain crops, which created another problem. Except in case of wheat during Rabi in season, no crop was found throughout the states as major.
- It was also reported that even though particular crop was available in the selected village, but not available in the selected survey number.
- Thus, many crops are missing and the data may not be proper representative of the crops grown in the district.
- So, state level estimates could not be generated for most of the crops by simply adding district level estimates.

8.5 Conclusions & Recommendations

Professor Vaidyanathan Committee reviewed the current Agricultural Statistical System and recommended reduced sample size to generate State and National level crop area and yield estimates of principal crops and to set up an independent agency to collect & process the field data. However, this project, even though constituted on the basis of the recommendations of Professor Vaidyanathan Committee, attempted to generate estimates at district level as requested by the funding agency.

- For area estimation, sample survey approach was considered based on enumeration of 100 survey numbers randomly selected from each selected village instead of complete enumeration of selected villages.
- With the given sample size, the major crops were captured in the selected villages, if it was available. For area enumeration one of the major issues emerged was selection of 100 survey numbers in place of complete enumeration.

- While some difficulties were faced in executing the same as discussed earlier.

- From the observations of the project, it was therefore suggested that the stratum should be agro-climatic zones instead of districts in each state to generate state as well as national level estimates which was also recommended in the report by Prof. Vaidyanathan Committee and subsequently, district level estimates could be generated by using techniques like small area estimation (SAE).

- Another issue cropped up during survey was the concept of major crop. There was lot of confusions regarding definition of major crop. A crop, which is major at state level, may not be grown by all the districts or at village level. On the other hand, crops grown in the selected field may not be the major crop at district or state level. Due to this confusion coupled with smaller sample and non-coverage of entire village, many a times, important crops were missed or unimportant crops were covered. It is, therefore, advisable to pre-determine the crops to be covered in the survey and data may be collected only on these crops.

- In this project, it was observed that day by day, implementation of CCE is becoming difficult, due to shortage of trained personnel, lack of co-ordination between farmers and primary agencies, reluctance on the part of farmers and many other operational hazards. Further, mechanized harvesting is making it difficult to keep a small plot for separate harvesting.

- There is an increasing need of disaggregate level estimates of yield estimates (e.g. for the purpose of crop insurance etc.). This further requires an increasing number of CCEs to meet this demand to generate the reliable yield estimates at disaggregate

level such as village and gram panchayat level. This clearly indicates an urgent need to explore new techniques to estimate yield rates using modern technologies in order to reduce the number of CCEs significantly. It is therefore suggested to explore recent survey estimation methodologies such as integration of data, combining of survey data, small area estimation etc. to meet such demands.

- One of the objectives of this project was to explore the feasibility of using PDA and GPS device in data collection work in few selected tehsils. Accordingly, ICAR-IASRI had developed the MAPI software and selected one district in Gujarat for field data collection using hand held devices like tablets with this software. MAPI can be used in smart phones or tablets and enabled field staff to collect data directly from the field and transmit to his supervisor or to processing center. It was observed that MAPI could reduce the time lag to a considerable extent as it eliminates some activities such as data entry, submission of schedule, table scrutiny, back references etc. As some of the validation like coverage, range etc. is part of this software, many of the mistakes could be detected and rectified at the field level itself. GPS fitted with the devices would enable the software to record the location of the field, which helps in to control and manage the field work more effectively and also ensures validity of the data. The device may also measure the field, if necessary using GPS. Another advantage of this system is to have images of the experimental field and store it. This opens up lot of opportunities. Images of standing crop along with some auxiliary information could predict yield estimates though image analysis. This software could be customized for all others survey as well. It is, therefore, suggested that hand held devices

with MAPI may be used for data collection in every survey in future.

- The major objective of the study was to generate the state level estimate of crop area and yield of the major crops under considerations. But due to change in sampling design to generate district level estimates as requested by the sponsoring agency, there was a problem while selection of major crops as it varies at disaggregate level i.e. districts, village etc. than that of the state. For generation of district level estimates, the stratum was shifted to districts from agro-climatic zones which summoned in the problem of major crops as well as small or no sample size is few districts. Due to this fact, the district level estimates for all the major crops for all the districts are not been generated. For generation of state level estimates from the proposed reduced sample size, we recommend use of Agro-climatic zone as stratum instead of districts.

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Glimpses of Meetings and Field Survey

Meeting at IASRI, New Delhi on March 3, 2016

Meeting at IASRI, New Delhi on March 3, 2016

CCE Meeting with IASRI Officers at the Director Officer on September 20, 2016

CCE Meeting with IASRI Officers and Centre staff on September 20, 2016

Meeting with MoA & FW (GoI) and IASRI Officers with Centre staff on April 23, 2018

CCE Training to Field Staff at Rajkot on October 8, 2016

CCE Training to Field Staff at Rajkot on October 8, 2016

CCE field visit and discussion with sample farmers at Rajkot on October 8, 2016

CCE field survey by AERC & CCS staff at Panchmalas districts

CCE conducted of Groundnut plot by GoG staff in Rajkot

CCE conducted of Groundnut plot by GoG staff in Rajkot

Threshring of Paddy (Gujari variety) by household at Panchmahal district

Threshring of Paddy (Gujari variety) by household at Panchmahal district

Paddy harvest- Gujari variety- Mahisagar district

CCE plot for Kharif season at Gandhinagar district

CCE plot for Rabi season at Gandhinagar district

CCE plot visit by Centre staff for Rabi season (Wheat Plot)

CCE plot visit by Centre staff for Rabi season

CCE plot visit by Centre staff for Rabi season

CCE Kharif plot selection at Gandhinagar (Bajara Plot)

CCE plot visit by IASRI, New Delhi Officers at Gandhinagar (Kharif Bajra)

CCE Kharif plot selection at Gandhinagar for Mapi

CCE Kharif plot selection at Gandhinagar for Mapi

CCE plot visit by IASRI, New Delhi Officers at Gandhinagar (Kharif Bajra)

CCE plot visit by IASRI, New Delhi Officers at Gandhinagar

CCE plot visit by IASRI, New Delhi Officers at Junagdh district

CCE plot visit by IASRI, New Delhi Officers at Junagadh district

CCE plot visit and verification of field data by IASRI, New Delhi
Officers at Junagadh district

CCE plot visit by IASRI, New Delhi Officers at Junagdh district

CCE plot visit and verification of field data by IASRI, New Delhi
Officers at Junagdh district

Weighing Machines

Annexures

Annexure 1 - Nine-fold classification of Land Use[1]

Statistics on land use are collected at present, in the form of a nine-fold classification on a yearly basis.

Out of a geographical area of 329 million hectares (reporting area) statistics are available only from 305 million hectares (non-reporting area), which makes some areas to the extent of 7% still not covered or classifiable under the nine-fold classification.

The reporting area is classified into the following nine categories:

o   Forests: This includes all lands classed as forest under any legal enactment dealing with forests or administered as forests, whether state-owned or private, and whether wooded or maintained as potential forest land. The area of crops raised in the forest and grazing lands or areas open for grazing within the forests should remain included under the forest area.

o   Area under Non-agricultural Uses: This includes all lands occupied by buildings, roads and railways or under water, e.g. rivers and canals and other lands put to uses other than agriculture.

o   Barren and Un-culturable Land: includes all barren and unculturable land like mountains, deserts, etc. Land which cannot be brought under cultivation except at an exorbitant cost, should be classed as unculturable whether such land is in isolated blocks or within cultivated holdings.

o   Permanent Pastures and other Grazing Lands: includes all grazing lands whether they are permanent pastures and meadows or not. Village common grazing land is included under this head.

o   Land under Miscellaneous Tree Crops, etc. : This includes all cultivable land which is not included in 'Net area sown' but is put to some agricultural uses. Lands under Casurina trees, thatching grasses, bamboo bushes and other groves for fuel, etc. which are not included under 'Orchards' should be classed under this category.

o   Culturable Waste Land: This includes lands available for cultivation, whether not taken up for cultivation or taken up for cultivation once but not cultivated during the current year and the last five years or more in succession for one reason or other. Such lands may be either fallow or covered with shrubs and jungles, which are not put to any use. They may be assessed or unassessed and may lie in isolated blocks or within cultivated holdings. Land once cultivated but not cultivated for five years in succession should also be included in this category at the end of the five years.

o   Fallow Lands other than Current Fallows: This includes all lands, which were taken up for cultivation but are temporarily out of cultivation for a period of not less than one year and not more than five years.

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[1] http://mospi.nic.in/45-nine-fold-classification-land-use

- ○ Current Fallows: This represents cropped area, which are kept fallow during the current year. For example, if any seeding area is not cropped against the same year it may be treated as current fallow.

- ○ Net area Sown: This represents the total area sown with crops and orchards. Area sown more than once in the same year is counted only once.

Annexure II- Main features of the components of the Scheme "Improvement of Agriculture Statistics"

TRS Timely Reporting Scheme	EARAS Establishment of an Agency for Reporting Agricultural Statistics	ICS Improvement of Crop Statistics
1. Commencement Started in 1968-69	Started in 1975-76	Started in 1973-74
2. Coverage Covers 19 temporarily settled States where revenue agencies maintain records of land utilisation statistics namely, Andhra Pradesh, Assam, Bihar, Chattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh, Uttarakhand, Puducherry and Delhi.	Covers 3 permanently settled States of Kerala, Orissa, West Bengal and 4 North Eastern States namely, Arunachal Pradesh, Nagaland, Sikkim and Tripura.	Covers 22 States/UTs of Andhra Pradesh, Assam, Bihar, Chattisgarh, Gujrat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh, Uttarakhand, Delhi and Puducherry and Kerala, Orissa & West Bengal
3. Pattern of assistance 100% by Government of India Budget for 2007-2008 Rs. 928.00 lakh Budget for 2008-2009 Rs. 1042.60 lakh Budget for 2009-2010 Rs. 1323.60 lakh Budget for 2010-2011 Rs. 1490.00 lakh	100% by Government of India Rs. 2991.00 lakh Rs. 3217.00 lakh Rs. 4145.00 lakh Rs. 4050.00 lakh	100% by Government of India Rs. 668.00 lakh Rs. 718.40 lakh Rs. 1007.90 lakh Rs. 1070.00 lakh
4. Regular Manpower Statistical staff: 602 Secretarial Assistance: 47 Peons: 69 Total: 718	Supervisory Staff: 52 Field Staff: 2499 Secretarial Assistance:127 Peons: 70 Total: 2748	Supervisors of Supervisory Staff: 23 Supervisory Staff:320 Secretarial Assistance:40 Peons:79 Total:462

TRS Timely Reporting Scheme	EARAS Establishment of an Agency for Reporting Agricultural Statistics	ICS Improvement of Crop Statistics
Andhra Pradesh Assam Bihar Chattisgarh Gujarat Haryana Himachal Pradesh Jammu & Kashmir Jharkhand Karnataka Madhya Pradesh Maharashtra Rajasthan Tamilnadu Uttar Pradesh Uttarkhand Delhi Puducherry	Kerala Orissa West Bengal Arunachal Pradesh Nagaland Tripura Sikkim (There are 138 staff on honorarium basis in Sikkim)	Andhra Pradesh Assam Bihar Chattisgarh Gujarat Haryana Himachal Pradesh Jammu & Kashmir Jharkhand Karnataka Madhya Pradesh Maharashtra Rajasthan Tamilnadu Uttar Pradesh Uttarkhand Puducherry
5. Main Objective To obtain reliable and timely estimates of area under principal crops in each season with break up of area under irrigated/ un-irrigated, traditional and high yielding varieties of crops and land utilisation statistics, which is used to design crop estimation survey by conducting priority Girdawari in 20% of villages every year. Villages are selected in such a way that all the villages are covered in a state in five years. The scheme is implemented in the States that are cadastrally surveyed.	To generate estimates of area and production of principal crops in each season through surveys in 20% selected villages through staff recruited for this purpose only. Villages are selected in such a way that all the villages are covered in a state in five years. In the sample village, crop area is to be reported based on complete enumeration of all fields/survey numbers. Surveys are specially required as no agency in these States is engaged in updating land use statistics.	The objective of this scheme is locating through joint efforts of the Central and State Agencies, deficiencies in the system of collection of crop statistics and suggests remedial measures for effecting lasting improvement in the system. The scheme accomplishes its objective by conducting sample checks on the primary field work through: a) physical verification of the crop enumeration done by the primary workers in a sample about 10,000 villages in each season b) Checking of the aggregation of crop-wise area in the khasra register of these villages and c) Supervision of about 30,000 crop cutting experiments at harvest stage in a year.

TRS Timely Reporting Scheme	EARAS Establishment of an Agency for Reporting Agricultural Statistics	ICS Improvement of Crop Statistics
6. Data collection at Grass-root level Government of India does not fund primary data collection by Patwari under TRS. It covers sampling design of TRS for priority data collection, timely completion of consolidation at district and State level.	Primary data collection and its supervision by Revenue Inspectors under Directorate of Land Records in West-Bengal and staff engaged under the EARAS scheme in other States and its consolidation at district and State level.	1) Central agency – NSSO (not funded) 2) State – Supervisory Staff engaged by States under the Scheme.
7.Need for Scheme Land Record Manual in different States contains instructions on period of crop enumeration and procedure for compilation of crop area at village and successive higher levels with the expectation that crop abstract would become available by the time the final forecast for different crops become due. Experience has shown that there has been considerable time lag in the availability of reliable and correct statistics of area sown under different crops. This has greatly handicapped catering to the needs of monitoring the plans and timely policy formulations. TRS provide for consolidation of area statistics through advance enumeration of adequate number (20%) of villages selected at random.	In the non-land record States, the State agencies do not update land utilisation records and therefore there exist gap in the data. The scheme provides for setting up of a full fledged agency to cover a sample of 20% of the villages every year, to generate basic land use statistics. In each sample village complete enumeration is done to record areas under crops. Supervision is also done under the scheme.	The scheme is needed to locate lacuna, if any, in the State system of collection of agricultural statistics and suggest measures to effect lasting improvements in this system, through joint efforts of the Central and State authorities. The joint efforts are in the form of sample check on (I) area enumeration, (ii) page totaling of khasra registers and (iii) conduct of crop cutting experiments.

TRS Timely Reporting Scheme	EARAS Establishment of an Agency for Reporting Agricultural Statistics	ICS Improvement of Crop Statistics
8.Methodology/ Procedure The basic approach of the scheme is to organise selection of 20% villages and to complete on top priority the crop area enumeration in selected villages by the primary workers in tune with the sowing season of different crops and by suitably advancing the same, when needed. The crop enumeration organised through TRS facilitates the frame for Crop Estimation. The special emphasis on timeliness and accuracy of crop area enumeration in a large sample of villages bring about the improvement in the system of collection and compilation of statistics of area under crops.	In West Bengal and Orissa, the crop wise area enumeration work is done in all Mouzas/Villages selected under EARAS. Besides area statistics, EARAS provides frame to select plots for conduct of crop cutting experiments to estimate yield rates. In Kerala, for collection of area statistics, the State is divided into 811 investigator zone. A sample of 100 key plots is selected from each investigator zone. With respect to each key plot a cluster consisting of 5 sub survey division numbers is formed and land utilisation statistics are collected from these 100 clusters of 5 sub survey division numbers.	The sample check on area enumeration consist of selecting and locating a sample of 20 survey/sub-survey numbers within each selected village with the help of Khasra register and village maps and then recording the actual utilisation by the supervisor. The sample check on preparation of crop abstract consists of checking of page wise totals of area figures recorded under crops and utilisation in the khasra register and recording the totals of crop areas and utilisation. Supervision on crop cutting experiments at harvest stage covers specified major crops and consist of examining whether the State primary worker conducts the experiments conforming to the procedure laid down under the General Crop Estimation Surveys of the State. The aspect of check includes the selection of survey numbers/ sub-survey numbers, fields and random coordinates, marking of plots and harvesting and weighing of produce.

डॉ. उमेश चन्दर सूद
निदेशक

Dr. Umesh Chander Sud
Director

D.O. No.DIR/SS/VC/SLECAP/2015
Dated the 08 April, 2015

Dear Sh. Shah,

This has a reference to my letter D.O.No.DIR/SS/LW/NSP/2015 dated the 05 March, 2015 inviting you to participate in the **LAUNCH WORKSHOP** organised at the Institute during **23-24 March, 2015** pertaining to the three Externally funded projects. The proceedings of the Workshop are being sent to you for your information.
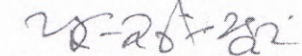
The Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India has given a project entitled **Pilot Study for Developing State Level Estimates of Crop Area and Production on the basis of Sample Sizes Recommended by Professor Vaidyanathan Committee Report**, to the Institute under which a pilot sample survey has to be carried out in 5 States namely **Assam, Gujarat, Karnataka, Orissa and Uttar Pradesh** during **Agricultural Year 2015-16**. A brief note pertaining to the project along with the budgetary provisions for the purpose is attached herewith for your kind perusal.

I am to kindly request you to give your concurrence for undertaking the field data collection work etc. so that adequate funds may be transferred to your department. If needed, I shall be deputing the concerned scientists to your department for further discussion.

Kindly get the receipt of this letter acknowledged. An early action in this regard shall be highly solicited.

With regards,

Yours sincerely,

(U.C. Sud)

Sh. B.R. Shah,
Director, Directorate of Economics & Statistics,
Government of Gujarat,
2nd floor, Sector 10A, Krishi Bhawan,
Gandhinagar-380 051
(Gujarat)

Pilot Study for Developing State level Estimates of Crop Area and Production on the basis of Sample Sizes recommended by Professor Vaidyanathan Committee report (funded by Deptt of Agriculture & Cooperation, Ministry of Agriculture, Government of India)

Agriculture with its allied sectors viz. horticulture, animal husbandry, fishery, forestry etc. is the largest livelihood provider making significant contribution to the national Gross Domestic Product in India. Lack of quality agricultural statistics may lead to misallocation of scarce resources and policy formulations that fail to resolve critical development problems. As such generation of timely, reliable and quality agricultural statistics assumes importance for policy planning and administrative decision making. Reviewing and upgrading mechanism for continuous generation of timely and reliable agricultural statistics therefore is of paramount importance. Two major approaches for development of appropriate methodologies for generation of agricultural statistics are (a) complete enumeration, and (b) sample survey. Sample survey is generally adopted because it provides cost effective, timely, precise and quality output. The **two major components of agricultural statistics** are the **estimate of crop area and crop yield whereas estimates of crop production are obtained by multiplication of area estimates by corresponding yield estimates**. In agricultural statistics the **concept of yield** has been generally used to represent the **average amount of produce obtained per unit of crop area** while **crop area** can be defined as **the horizontal projection of a particular extent of earth's surface** which corresponds to the area shown on cadastral maps.

From the point of view of collection of area statistics, the States in the country are divided into three broader categories: i) States and Union Territories (UTs) which have been cadastrally surveyed and where area and land use statistics are built up as part of the land records maintained by the revenue agencies (referred to as **Land Record States** or **Temporarily Settled States**). The system of land record is being followed in large number of States and UTs. **These States/UTs account for about 86% of reporting area**; ii) the states where area statistics are collected on the basis of sample surveys (normally known as **Non-land Record States** or **Permanently Settled States** viz. **Kerala, Orissa and West Bengal**). A scheme for **Establishment of Agency for Reporting of Agricultural Statistics (EARAS)** has been introduced in these three States which envisages, inter-alia, either the estimation of area by complete enumeration or through sample surveys in a sufficiently large sample of **20% villages/ investigators zones. These States accounts for about 9% of reporting area**; and iii) in **hilly districts of Assam, the rest of the states in North-Eastern Region, Sikkim, Goa, UTs of Andaman & Nicobar Islands, Daman & Diu and Lakshadweep** where no reporting agency had been functioning, the work of collection of Agricultural Statistics is entrusted with the village headmen **(5%)**.

In India, **estimates of yield rates of principal food and non-food crops are obtained on the basis of crop cutting experiments (CCEs) conducted in majority of States/Union Territory (UTs)** under the National Programme of Crop Estimation Survey (CES). At present, over 95 per cent of the production of food grains is estimated on the basis of yield rates obtained from the CCEs conducted on scientific basis spread over 29 States /UTs. The **Directorate of Economics and Statistics (DES) releases estimates of area, production and yield in respect of principal crops** of food grains, oilseeds, sugarcane, fibers and important commercial and horticulture crops. These crops all together account for nearly 87 per cent of agriculture output. The primary

responsibility for collection of statistics of land use and area under crops following prescribed procedures rests with the various State authorities. **The yield rates of principal crops are estimated through General Crop Estimation Survey (GCES) conducted by State agencies following the technique of stratified multi-stage random sampling.**

During past few agricultural years, a total number of approximately **9,00,000 CCEs covering 52 food and 16 non-food crops** were planned in different States/UTs as compared to **1,73,097 CCEs planned during 1973-74**. The **number of CCEs is on the rise and as such different types of non-sampling errors etc. have affected the data quality**. In order to overcome this problem, **Improvement in Crop Statistics (ICS) scheme** has been in operation but desired improvement in data quality is not forthcoming.

To overcome this problem, Government of India had constituted a **Committee on Improvement of Agricultural Statistics under the chairmanship of Professor A. Vaidyanathan**. The Committee recommended to revamp the existing system by setting up of **National Centre for Crop Statistics (NCSC)** for generating reliable and unbiased estimates of land use, crop area and yield at the State and National level through enumeration of sample crops in a **sample of 15,000 villages with 90,000 crop cutting experiments (CCEs)**. The broader objectives studied were to (i) review the problems in implementing the methodology and procedures prescribed for the collection/estimation of data on land use, cropping and yields and suggest measures to solve them; (ii) assess the potential of remote sensing techniques to collect these data and to indicate how to utilize this potential; and (iii) suggest institutional framework for Improvement of Agricultural Statistics.

In order to implement the Professor Vaidyanathan Committee's recommendations to strengthen the existing system, the DoAC, MoA, GoI has decided to conduct a **pilot sample survey through IASRI, New Delhi**. Accordingly, this project proposal was prepared with the specific purpose of examining the reliability of estimates of crop area and crop production at State and National level on the basis of sample sizes recommended by the Vaidyanathan committee report. **Under this study, it is proposed to develop the sampling methodology for estimation of State-wise crop area and crop yields for major food grain crops, to see the adequacy/feasibility of the sample sizes at different stages of sample selection for obtaining the estimates with suitable precision**, to explore the feasibility of using **Personal Digital Assistant (PDA)** and **Global Positioning System (GPS)** device in data collection work and to carry out statistical comparison of data collected through **Paper and Computer Assisted Personal Interview (i.e. PAPI and CAPI) in few selected tehsils.**

The **pilot survey is proposed to be conducted in 5 States, namely, Assam, Gujarat, Karnataka, Orissa and Uttar Pradesh**. Prof. Vaidyanathan Committee has recommended a sample of **15,000 villages** to be canvassed. Accordingly, on the basis of Gross Cropped Area of States, a **sample of size 4,700 villages has been allocated to these 5 States**. As per Prof. Vaidyanathan Committee recommendations, **for estimation of area under major food grain crops, a sample of 100 Survey Numbers/Fields in each of the randomly selected village** has to be taken while **for estimation of average yield, 6 CCEs on 3 crops (@ 2 CCEs per crop)** are to be conducted in each village during AY 2015-16. Accordingly, **for area estimation, 4,70,000 Survey Numbers/Fields (= 4700 V x 100 Survey Numbers/Fields) have to be randomly selected and their area under crop recorded**. For **yield estimation, a total of 4,700 V x 6 CCEs = 28,200 CCEs** is proposed to be conducted in these **5 States (Assam: 300**

Villages, Gujarat: 900 Villages, Karnataka: 1,000 Villages, Orissa: 500 Villages and Uttar Pradesh: 2,000 Villages).

For the estimation of average yield, the sampling design will be **stratified four stage random sampling**. Within each State, district wise list of Tehsils/Taluks/RI Circles/CD Blocks/Anchals etc. (sampling frame) will be prepared. Out of this frame, a random sample of Tehsils/Taluks/RI Circles/CD Blocks/Anchals etc. will be selected. This will be the primary stage sampling unit (PSUs). At the secondary stage, list of villages among the selected Tehsils/Taluks/RI Circles/CD Blocks/Anchals etc. will be prepared and a sample of revenue villages will be selected.

Ecostate/CES-FORECAST/Pilot Study/23022-23/2015

Directorate of Agriculture, Gujarat State.
Krushibhavan, Sector-10 A
'Ch' road, Gandhinagar.
Date: 18 / 11 / 2015

To,
Dr. Umeshchandra Sud
Director, ICAR - IASRI
Library Avenue, Pusa,
New Delhi-110 012

Subject: Pilot Study Project Recommended by Professor Vaidyanath Committee Report.

Reference: Your Email dated 10h November 2015.

Sir,

With reference to above referred letter and your visit to Gujarat on 09.09.2015 discussion held regarding the information required from your side for pilot project, were taluka wise area and village list planned for crop cutting experiments for Kharif Paddy, Kharif Tur, Kharif Cotton, Kharif Groundnut, Summer Groundnut, Kharif Maize, Castor, Sesamum, Wheat Irrigated, Kharif Bajara, Gram, Mustard crops. We have sent a complete village list of crop cutting experiments planned for 33 district for the above crops on dated 18th September, 2015 via Email. Similarly we have also sent talukas wise cropped area for the year 2011-12, 2012-13, and 2013-14 on 24th September as per our telephonic discussion with Dr. Kaustav Aditya, Scientist, ICAR-IASRI. We would like to inform you that from the year 2014-15 newly carved 7 districts came into existence for which tentative data of cropped area is available with us which we have sent you by email dated 17th November 2015. Village wise cropped area is not available with us because this work is carried out by Revenue department at Office of TDO and tehsildar, thus we have provided you taluka wise gross cropped area. This is for your kind information and necessary action please.

With kind Regards,

Yours faithfully

For, Director of Agriculture
Gujarat State, Gandhinagar.

Copy to.: Dr. S.S. kalamkar, Director, Agro Economic Research Centre, Sardar Patel University ,Vallabh Vidhyanagar-388120, Dist-Anand.

Ecostate/CES-FORECAST/Pilot Study/27 अपि7/2015

Directorate of Agriculture, Gujarat State.
Krushibhavan, Sector-10 A
'Ch' road, Gandhinagar.
Date: 31/12/2015

To,
Dr. S. S. Kalamkar,
Director, Agro Economic Research Centre Library Avenue,
Sardar Patel University
Vallabh Vidhyanagar-388120,
Dist-Anand.

Subject: Pilot Study for Developing State Level Estimates of Crop Area and production on the basis of Sample Sizes Recommended by Professor Vaidyanath Committee Report.
Reference: 1) Your Letter No. AERC/1.40.6/529/2015 dated: 31/10/2015
2) Meeting regarding pilot study project dated 30/11/2015

Sir,

With reference to above subject and reference we would like to inform you that for the Pilot Study for Developing State Level Estimates of Crop Area and production on the basis of Sample Sizes Recommended by Professor Vaidyanath Committee Report for the work of yield estimation through crop cutting experiments on your part we would like to request you to please furnish the details of account and banks for the disbursement of the fund required to carry out the project part. detail

With kind Regards,

Yours faithfully

Director of Agriculture
Gujarat State, Gandhinagar.

Copy to.: Dr. Umeshchandra Sud, Director, ICAR – IASRI, Library Avenue, Pusa, New Delhi-110 012

भाकृअनुप - भारतीय कृषि सांख्यिकी अनुसंधान संस्थान

लाइब्रेरी एवेन्यू, पूसा, नई दिल्ली-110 012

ICAR – Indian Agricultural Statistics Research Institute
Library Avenue, Pusa, New Delhi-110 012

डॉ. उमेश चन्दर सूद
निदेशक

Dr. Umesh Chander Sud
Director

D.O. No.DIR/SS/VC/Workshop/2017
Dated the 21 February, 2017

Dear Dr. Kalamkar,

This has a reference to the project entitled **Pilot study for Developing State Level Estimates of Crop Area and Production on the basis of Sample Sizes Recommended by Professor Vaidyanathan Committee Report (funded by Deptt of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India).**

As you are aware that under the project, the field data collection work during AY 2015-16 has been completed and the data entry work is in progress in four States namely Assam, Karnataka, Odisha & Uttar Pradesh. Most of the data has been received at the Institute and is under the process of scrutiny, checking and analysis.

For reviewing the progress and discussing various technical, operational and administrative issues etc. being faced by different States in the field data collection, data entry work etc., a **WORKSHOP** is going to be organized during **17-18 March, 2017** (Friday-Saturday) at ICAR-IASRI campus. In this Workshop, officials from different participating States, officials from the Directorate of Economics & Statistics (DES), DACFW, MoAFW, GoI and other organizations shall participate.

The Inaugural Session of the Workshop shall commence on 17th March, 2017 (Friday) at 10.00 AM at ICAR-IASRI, followed by other technical sessions.

I request you to kindly make it convenient to participate in the workshop along with one or two officials involved in the project work. The detailed programme of the Workshop will be communicated to you shortly. Please bring along one ppt presentation (for about 30 minutes) regarding the issues and problems faced during the field data collection work etc. pertaining to the project.

A line in confirmation shall be highly appreciated.

Further, I would like to mention that because of non-receipt of complete data from various participating States and on-going field work in Gujarat State, the date of completion has been extended upto 31 August, 2017 with the approval of the funding agency.

With regards,

Yours sincerely,

(U.C. Sud)

Dr. S.S. Kalamkar,
Director, Agro-Economic Research Centre,
H.M. Patel Institute of Rural Development,
Opposite Nanadalaya Temple, Post Box No. 24,
Sardar Patel University, Vallabh Vidyanagar-388120,
District Anand (Gujarat)

भा. कृ. अ.प.-भारतीय कृषि सांख्यिकी अनुसंधान संस्थान
लायब्रेरी एवेन्यू, नई दिल्ली –110012
प्रतिदर्श सर्वेक्षण प्रभाग
ICAR-INDIAN AGRICULTURAL STATISTICS RESEARCH INSTITUTE
Library Avenue, New Delhi-110012
Division of Sample Surveys

डॉ कौस्तव आदित्य
वैज्ञानिक एवं परियोजना अन्वेषक
Dr. Kaustav Aditya
Scientist and Project Investigator

D.O. No.DIR/SS/VC/PMC/2018
Dated the 16th April, 2018

Dear Dr. Kalamkar,

This has a reference to the project entitled **Pilot study for developing State level estimates of crop area and production on the basis of sample size recommended by Prof Vaidyanathan Committee Report**, funded by Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, Govt. of India.

In the last Project Management Committee (PMC) meeting of the project held at ICAR-IASRI, New Delhi-110012 on February 21, 2018, it was decided that the next PMC meeting will be held at Gujarat at the earliest.

Accordingly, a meeting of the PMC under the chairmanship of Dr L M Bhar, Director, ICAR-IASRI & Chairman, PMC to review progress of the project work, is proposed to be organized by AERC, Vallabh Vidyanagar, Anand, Gujarat on 23rd April, 2018 followed by a field visit on 24th April, 2018 to understand field experiences of your State and sharing the experiences obtained from other states during this study while carrying out field work. The total number of participants will be around 10 including two officials from DES, DoACFW, MoAFW, GoI (List of participants along with their travel plan will be sent shortly). You are therefore, requested to make necessary arrangements for holding the aforesaid PMC meeting including lodging and transport arrangements. For any assistance from our side, kindly let us know.

With regards,

Your sincerely,

(Kaustav Aditya)
Principal Investigator

To,
Dr. S.S. Kalamkar
Director and Professor
Agro-Economic Research Centre
For the states of Gujarat and Rajasthan
Vallabh Vidyanagar, Anand, Gujarat

Proceedings of the meeting of the Project Management Committee (PMC) for the project "Pilot Study for Developing State Level Estimates of Crop Area and Production on the basis of Sample Sizes Recommended by Professor Vaidyanathan Committee", held at the Agro-Economic Research centre, Sardar Patel University, Vallabh Vidyanagar, Anand (Gujarat) on April 23, 2018

A meeting of the **Project Management Committee (PMC)** of the project entitled **Pilot Study for Developing State Level Estimates of Crop Area and Production on the basis of Sample Sizes Recommended by Professor Vaidyanathan Committee** was held under the Chairmanship of **Dr. L. M. Bhar**, Director, ICAR-IASRI, New Delhi & **Chairman, PMC** of the project on April 23, 2018 at around 11.00 am in Seminar Hall of Agro-Economic Research centre, Sardar Patel University, Vallabh Vidyanagar, Anand (Gujarat) on April 23, 2018, for reviewing the progress of the project and resolving various administrative and technical issues. The list of the officials who attended the meeting is annexed.

At the outset, the Chairman welcomed **Shri Nand Lal**, Adviser from Directorate of Economics and Statistics, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Govt. of India and all the other Members of the PMC. He highlighted the importance of the project and also gave his observation about the project. Thereafter, meeting started with discussion on the proceedings of the last PMC meeting held at IASRI, New Delhi on July 11, 2017. The PMC confirmed the proceedings of the meeting.

With the approval of Chairman, **Dr. S. S. Kalamkar** made a presentation on the planning, procedures adopted and execution of field work and crop cutting experiments conducted in the selected 900 villages of Gujarat. The presentation also highlighted the field experiences during the crop cutting experiments during Agriculture Year 2016-17. All the members of the PMC have expressed their satisfaction on the adoption of instructions and methodology given by IASRI by the AERC during field survey work. Committee members have noted with pleasure that no selected village was replaced by AERC and all the 900 villages were visited and village data were collected. Besides, it was noted that AERC had made all attempt to get crop cutting experiments of not only the food grain crops but also CCEs of pulses and edible oilseed crops were executed. Committee also noted that AERC has submitted all datasets of 900 selected villages and all crop cutting experiment conducted in soft copy form. Subsequently, state-wise progress of project work was also discussed.

Committee noted with pleasure that MAPPI software was executed successfully in selected villages of Gandhinagar district of Gujarat and data generated from the software has been submitted long back to IASRI. As all the data sets are submitted by AERC, Director AERC requested honorable members of the PMC to consider request to

release the balance grants-in-aid/funds so that balance payment can be made to the staff involved as per the University rules.

After detailed discussion on the request of Director, AERC, PMC unanimously recommended to release the balance and last installment of funds to AERC at the earliest.

The meeting ended with a vote of thanks to the Chair.

(Kaustav Aditya)   (Hukum Chandra)   (Tauqueer Ahmad)   (L. M. Bhar)

Scientist & Principal Investigator   Head, Division of Sample Surveys   Director

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Proceedings of the meeting of the Project Management Committee (PMC) for the project "Pilot Study for Developing State Level Estimates of Crop Area and Production on the basis of Sample Sizes Recommended by Professor Vaidyanathan Committee", held at the Agro-Economic Research centre, Sardar Patel University, Vallabh Vidyanagar, Anand (Gujarat) on April 23, 2018

List of the Officials who attended the meeting:

Sl. No.	Name of the Official	Designation	Position
1	Dr. L. M. Bhar	Director, ICAR-IASRI	Chairman
2	Shri Nand Lal	Adviser, DES, DAC, MoAFW, GoI	Member
3	Dr. Tauqueer Ahmad	Head, Division of Sample Surveys, ICAR-IASRI	Member
4.	Dr. Hukum Chandra	Principal Scientist & National Fellow, ICAR-IASRI	Member
5.	Dr. Kaustav Aditya	Scientist,ICAR-IASRI & Principal Investigator (PI)	Member-Secretary
6.	Shri Arvind	Sr. F & AO	Invitee
7.	Dr. S.S. Kalamkar	Director, AERC, SPU, VVN	Invitee
8.	Dr. M. Swain	Research Officer, AERC, SPU, VVN	Invitee
9.	Dr. S. R. Bhaiya	Field Officer, CCS, AERC, SPU, VVN	Invitee
10	Dr. Hemant Sharma	Research Officer, AERC, SPU, VVN	Invitee

Annexure IX- List of Selected Villages in Gujarat

1	Distict No.	District Name	Taluka Name	Selected Villages
v	1	Ahmedabad	Mandal	Dadhana
3	1	Ahmedabad	Mandal	Vinzuvada
4	1	Ahmedabad	Mandal	Sadra
5	1	Ahmedabad	Mandal	Haripur
94	1	Ahmedabad	Viramgam	Chanothiya
95	1	Ahmedabad	Viramgam	Kadipur
96	1	Ahmedabad	Viramgam	Sarsavadi
97	1	Ahmedabad	Viramgam	Thori Vadgas
98	1	Ahmedabad	Viramgam	Rangpur
99	1	Ahmedabad	Viramgam	Varsava
100	1	Ahmedabad	Viramgam	Asalgam
101	1	Ahmedabad	Viramgam	Vekariya
165	1	Ahmedabad	Sanand	Godhavi
166	1	Ahmedabad	Sanand	Zolapur
167	1	Ahmedabad	Sanand	Daduka
168	1	Ahmedabad	Sanand	Kodaliya
169	1	Ahmedabad	Sanand	Zamp
170	1	Ahmedabad	Sanand	Juwal
171	1	Ahmedabad	Sanand	Lodariyal
300	1	Ahmedabad	Dholka	Chaloda
301	1	Ahmedabad	Dholka	Shekhdi
302	1	Ahmedabad	Dholka	Sindhraj
303	1	Ahmedabad	Dholka	Kharanti
304	1	Ahmedabad	Dholka	Javaraj
305	1	Ahmedabad	Dholka	Vataman
306	1	Ahmedabad	Dholka	Anandpura
307	1	Ahmedabad	Dholka	Moti Boru
417	1	Ahmedabad	Dhandhuka	Nana Tradiya
418	1	Ahmedabad	Dhandhuka	Sarwal
419	1	Ahmedabad	Dhandhuka	Chharodiya
420	1	Ahmedabad	Dhandhuka	Morasiya
421	1	Ahmedabad	Dhandhuka	Kothadiya
422	1	Ahmedabad	Dhandhuka	Aniyali Bhimji
423	1	Ahmedabad	Dhandhuka	Pipal
424	1	Ahmedabad	Dhandhuka	Parabdi
425	1	Ahmedabad	Dhandhuka	Bhalgamda
426	1	Ahmedabad	Dhandhuka	Gorasu
493	2	Amreli	Amreli	Timba
494	2	Amreli	Amreli	Rikadiya
495	2	Amreli	Amreli	Ankadiya Nana
496	2	Amreli	Amreli	Ishvariya
497	2	Amreli	Amreli	Amarpur(Varudi)
498	2	Amreli	Amreli	Pratappara
499	2	Amreli	Amreli	Sanosara
500	2	Amreli	Amreli	Rajasthali
501	2	Amreli	Amreli	Lapaliya

502	2	Amreli	Amreli	Keriyachad
503	2	Amreli	Amreli	Malila
601	2	Amreli	Lathi	Punjapadar
602	2	Amreli	Lathi	Harsurpur
603	2	Amreli	Lathi	Pipalva Nana
604	2	Amreli	Lathi	Memada
605	2	Amreli	Lathi	Pratapgadh
606	2	Amreli	Lathi	Tajpar
607	2	Amreli	Lathi	Dahinthara
608	2	Amreli	Lathi	Suvagadh
609	2	Amreli	Lathi	Dudhala Bai
652	2	Amreli	Babara	Lalka
653	2	Amreli	Babara	Karnuki
654	2	Amreli	Babara	Untvad
655	2	Amreli	Babara	Raypar
656	2	Amreli	Babara	Nilavala
657	2	Amreli	Babara	Ghughrala
658	2	Amreli	Babara	Dared
659	2	Amreli	Babara	Vandaliya
660	2	Amreli	Babara	Bhildi
661	2	Amreli	Babara	Amrapara
709	2	Amreli	Kukavav	Targhari
710	2	Amreli	Kukavav	Badanpur Nava
711	2	Amreli	Kukavav	Badanpur Juna
712	2	Amreli	Kukavav	Dadva(Randal)
713	2	Amreli	Kukavav	Khajuri-Pipaliya
714	2	Amreli	Kukavav	Vadia
715	2	Amreli	Kukavav	Kolda
716	2	Amreli	Kukavav	Najapur
788	2	Amreli	Dhari	Gopalgram
789	2	Amreli	Dhari	Kathirvadar
790	2	Amreli	Dhari	Parbadi
791	2	Amreli	Dhari	Bharad
792	2	Amreli	Dhari	Monvel
793	2	Amreli	Dhari	Khicha
794	2	Amreli	Dhari	Khambhaliya
795	2	Amreli	Dhari	Vaghavadi
796	2	Amreli	Dhari	Jira
797	2	Amreli	Dhari	Govindpur
798	2	Amreli	Dhari	Tarasingada
1039	2	Amreli	Savarkundala	Khadkala
1040	2	Amreli	Savarkundala	Juna Savar
1041	2	Amreli	Savarkundala	Ghobapati
1042	2	Amreli	Savarkundala	Shelana
1043	2	Amreli	Savarkundala	Pithvadi
1044	2	Amreli	Savarkundala	Vanshiyali
1045	2	Amreli	Savarkundala	Ramgadh
1046	2	Amreli	Savarkundala	Jabal
1047	2	Amreli	Savarkundala	Abhrampara
1048	2	Amreli	Savarkundala	Bagoya
1049	2	Amreli	Savarkundala	Chikhali
1050	2	Amreli	Savarkundala	Khodiyana

1051	2	Amreli	Savarkundala	Absang
1112	3	Anand	Anand	Kanbhaipura
1113	3	Anand	Anand	Rajupura
1114	3	Anand	Anand	Rasnol
1115	3	Anand	Anand	Samrkha
1195	3	Anand	Borsad	Dali
1196	3	Anand	Borsad	Kasumbad
1197	3	Anand	Borsad	Pamol
1198	3	Anand	Borsad	Ras
1373	3	Anand	Khambhat	Shakkarpur
1374	3	Anand	Khambhat	Kali Talavadi
1375	3	Anand	Khambhat	Kansari
1376	3	Anand	Khambhat	Malu
1377	3	Anand	Khambhat	Tada Talav
1378	3	Anand	Khambhat	Vasana
1379	3	Anand	Khambhat	Vatadara
1428	3	Anand	Tarapur	Tol
1429	3	Anand	Tarapur	Bhudhej
1430	3	Anand	Tarapur	Kanavada
1431	3	Anand	Tarapur	Khanpur
1734	4	Arvalli	Dhansura	Patyo
1735	4	Arvalli	Dhansura	Rampura Kampo
1736	4	Arvalli	Dhansura	Naranpura
1737	4	Arvalli	Dhansura	Jalampur
1738	4	Arvalli	Dhansura	Lalino Math
1739	4	Arvalli	Dhansura	Dhamaniya
1740	4	Arvalli	Dhansura	Kidi
1741	4	Arvalli	Dhansura	Bilvaniya
1809	4	Arvalli	Malpur	Rugnathpur
1810	4	Arvalli	Malpur	Gopalpur
1811	4	Arvalli	Malpur	Maljina Pahadiya
1812	4	Arvalli	Malpur	Dhirakhantna Muvada
1813	4	Arvalli	Malpur	Bhempur
1814	4	Arvalli	Malpur	Vavdibara
1909	4	Arvalli	Meghraj	Mota Math
1910	4	Arvalli	Meghraj	Rajpur (Isari)
1911	4	Arvalli	Meghraj	Khokhariya
1912	4	Arvalli	Meghraj	Mahudi
1913	4	Arvalli	Meghraj	Kadvadi
1914	4	Arvalli	Meghraj	Lakhapur
1915	4	Arvalli	Meghraj	Ranjedi
1916	4	Arvalli	Meghraj	Iploda
1917	4	Arvalli	Meghraj	Lalakumpa
2142	5	Banaskatha	vav	Bhachali
2143	5	Banaskatha	vav	Gambhirpura
2144	5	Banaskatha	vav	Kareli
2145	5	Banaskatha	vav	Baradvi
2146	5	Banaskatha	vav	Lalpura
2147	5	Banaskatha	vav	Ravla
2148	5	Banaskatha	vav	Rampura
2149	5	Banaskatha	vav	Vajiyasara
2150	5	Banaskatha	vav	Sapreda

2220	5	Banaskatha	Bhabhar	Bhem Bordi
2221	5	Banaskatha	Bhabhar	Chatara
2222	5	Banaskatha	Bhabhar	Chichodara
2223	5	Banaskatha	Bhabhar	Manpura Bhabhar
2224	5	Banaskatha	Bhabhar	Roita
2435	5	Banaskatha	Lakhani	Asasan
2436	5	Banaskatha	Lakhani	Bhakadiyal
2437	5	Banaskatha	Lakhani	Dhunsol
2438	5	Banaskatha	Lakhani	Jasara
2439	5	Banaskatha	Lakhani	Matu
2440	5	Banaskatha	Lakhani	Nandla
2441	5	Banaskatha	Lakhani	Vasna (Kuda)
2553	5	Banaskatha	Dhanera	Dhakha
2554	5	Banaskatha	Dhanera	Gola
2555	5	Banaskatha	Dhanera	Jadiya
2556	5	Banaskatha	Dhanera	Talegadh
2557	5	Banaskatha	Dhanera	Kundi
2558	5	Banaskatha	Dhanera	Kunwarla
2559	5	Banaskatha	Dhanera	Rampura Chhota
2560	5	Banaskatha	Dhanera	Shergadh (Jadiya)
2561	5	Banaskatha	Dhanera	Aeta
3024	5	Banaskatha	Palanpur	Badarpura (Kalusana)
3025	5	Banaskatha	Palanpur	Asmapura (Gola)
3026	5	Banaskatha	Palanpur	Malpuriya
3027	5	Banaskatha	Palanpur	Godh
3028	5	Banaskatha	Palanpur	Jadial
3029	5	Banaskatha	Palanpur	Jagana
3030	5	Banaskatha	Palanpur	Lalawada
3031	5	Banaskatha	Palanpur	Pirojpura(Tankani)
3032	5	Banaskatha	Palanpur	Sedrasana
3033	5	Banaskatha	Palanpur	Takarwada
3143	5	Banaskatha	Danta	Chokibor
3144	5	Banaskatha	Danta	Begadiyavas
3145	5	Banaskatha	Danta	Kunvarsi
3146	5	Banaskatha	Danta	Vekari
3147	5	Banaskatha	Danta	Khandhora
3326	5	Banaskatha	Amirgadh	Laxmipura (Amirgadh)
3327	5	Banaskatha	Amirgadh	Khapa
3328	5	Banaskatha	Amirgadh	Khapara
3329	5	Banaskatha	Amirgadh	Rabariya
3581	6	Bharuch	Jhagadia	Tothidara
3582	6	Bharuch	Jhagadia	Andharkachhala
3583	6	Bharuch	Jhagadia	Malpor (Dumala)
3584	6	Bharuch	Jhagadia	Vaghpara (Dumala)
3585	6	Bharuch	Jhagadia	Dhundha
3772	6	Bharuch	Bharuch	Parkhet
3773	6	Bharuch	Bharuch	Bharthana
3774	6	Bharuch	Bharuch	Jhanor
3775	6	Bharuch	Bharuch	Vahalu
3776	6	Bharuch	Bharuch	Chavaj
3868	6	Bharuch	Amod	Ninam
3869	6	Bharuch	Amod	Sarbhan

3870	6	Bharuch	Amod	Buva
3871	6	Bharuch	Amod	Mangrol
3872	6	Bharuch	Amod	Sonama
3921	6	Bharuch	Jambusar	Samoj
3922	6	Bharuch	Jambusar	Panchakada
3923	6	Bharuch	Jambusar	Gajera
3924	6	Bharuch	Jambusar	Shambha
3925	6	Bharuch	Jambusar	Bhadkodaro
3926	6	Bharuch	Jambusar	Thakore Talavdi
3927	6	Bharuch	Jambusar	Tankari
4110	7	Bhavnagar	Umrala	Dadva (Randalna)
4111	7	Bhavnagar	Umrala	Dharwala
4112	7	Bhavnagar	Umrala	Golrama
4113	7	Bhavnagar	Umrala	Hadmatala
4114	7	Bhavnagar	Umrala	Khijadiya
4115	7	Bhavnagar	Umrala	Limbda
4116	7	Bhavnagar	Umrala	Parwala
4153	7	Bhavnagar	Talaja	Sakhvadar
4154	7	Bhavnagar	Talaja	Methla
4155	7	Bhavnagar	Talaja	Rampara
4156	7	Bhavnagar	Talaja	Juna Sangana
4157	7	Bhavnagar	Talaja	Navi Chhapari
4158	7	Bhavnagar	Talaja	Belada
4159	7	Bhavnagar	Talaja	Nani Babariyat
4160	7	Bhavnagar	Talaja	Moti Babariyat
4161	7	Bhavnagar	Talaja	Paniyali
4162	7	Bhavnagar	Talaja	Kathava
4163	7	Bhavnagar	Talaja	Bharapara
4164	7	Bhavnagar	Talaja	Ambla
4165	7	Bhavnagar	Talaja	Trapaj
4318	7	Bhavnagar	Bhavnagar	Bhandariya
4319	7	Bhavnagar	Bhavnagar	Thalsar
4320	7	Bhavnagar	Bhavnagar	Ganeshgadh
4321	7	Bhavnagar	Bhavnagar	Paliyad
4322	7	Bhavnagar	Bhavnagar	Jashavantpar
4373	7	Bhavnagar	Vallabhipur	Lundhara
4374	7	Bhavnagar	Vallabhipur	Lakhanka
4375	7	Bhavnagar	Vallabhipur	Hadmatiya
4376	7	Bhavnagar	Vallabhipur	Juna Rampar
4377	7	Bhavnagar	Vallabhipur	Velavadar
4378	7	Bhavnagar	Vallabhipur	Palanpar (t)
4379	7	Bhavnagar	Vallabhipur	Bhojpara
4429	7	Bhavnagar	Sihor	Vavdi (Gajabhai)
4430	7	Bhavnagar	Sihor	Pipaliya
4431	7	Bhavnagar	Sihor	Krushnapara
4432	7	Bhavnagar	Sihor	Dhrupka
4433	7	Bhavnagar	Sihor	Panchvada
4434	7	Bhavnagar	Sihor	Padapan
4435	7	Bhavnagar	Sihor	Malvan
4436	7	Bhavnagar	Sihor	Bhankhal
4437	7	Bhavnagar	Sihor	Madhada
4750	8	Botad	Botad	CHAKAMPAR

4751	8	Botad	Botad	HADADAD
4752	8	Botad	Botad	KUMBHARA
4753	8	Botad	Botad	LIMBODA
4754	8	Botad	Botad	NAGALPAR
4755	8	Botad	Botad	PIPARADI
4756	8	Botad	Botad	RAJPARA
4757	8	Botad	Botad	RATANVAV
4758	8	Botad	Botad	VAJELI
4759	8	Botad	Botad	SALAIYA
4826	8	Botad	Gadhada	BHIMDAD
4827	8	Botad	Gadhada	DERALA
4828	8	Botad	Gadhada	GADHALI-2
4829	8	Botad	Gadhada	GORADKA
4830	8	Botad	Gadhada	HOLAYA
4831	8	Botad	Gadhada	Ingorala
4832	8	Botad	Gadhada	ITARIYA
4833	8	Botad	Gadhada	JALALPUR
4834	8	Botad	Gadhada	PATANA
4835	8	Botad	Gadhada	Prahladgadh
4836	8	Botad	Gadhada	RATANPAR
4837	8	Botad	Gadhada	VIRAVADI
4940	9	chhotaudepur	chhotaudepur	Ambala
4941	9	chhotaudepur	chhotaudepur	Dungar Bhit
4942	9	chhotaudepur	chhotaudepur	Bhorda
4943	9	chhotaudepur	chhotaudepur	Guda
4944	9	chhotaudepur	chhotaudepur	Dadigam
4945	9	chhotaudepur	chhotaudepur	Ukhalvant
5143	9	chhotaudepur	Kawant	Rumadiya
5144	9	chhotaudepur	Kawant	Mankodi
5145	9	chhotaudepur	Kawant	Mota Vanta
5146	9	chhotaudepur	Kawant	Athadungari
5147	9	chhotaudepur	Kawant	kavant
5189	9	chhotaudepur	Sankheda	Fatepur
5190	9	chhotaudepur	Sankheda	Shreegam Dhanka
5191	9	chhotaudepur	Sankheda	Sherlal Gamadi
5192	9	chhotaudepur	Sankheda	Kothiya
5193	9	chhotaudepur	Sankheda	Kotali
5194	9	chhotaudepur	Sankheda	Lachhras
5609	10	Dahod	Garbada	Chandla
5610	10	Dahod	Garbada	Matwa
5611	10	Dahod	Garbada	Nelsur
5612	10	Dahod	Garbada	Simaliya Bujarg
5808	10	Dahod	Fatepura	Chhalor
5809	10	Dahod	Fatepura	Amlikheda
5810	10	Dahod	Fatepura	Dablara
5811	10	Dahod	Fatepura	Dhadhela
5812	10	Dahod	Fatepura	Lakhanpur
5908	10	Dahod	Limkheda	Bhanpur (Randhikpur)
5909	10	Dahod	Limkheda	Pisoi
5910	10	Dahod	Limkheda	Shasta
5911	10	Dahod	Limkheda	Vateda
5912	10	Dahod	Limkheda	Chopat Palli

5913	10	Dahod	Limkheda	Zarola (Randhikpur)
5914	10	Dahod	Limkheda	Jetpur (R)
6150	10	Dahod	Devgadh Baria	Degavada
6151	10	Dahod	Devgadh Baria	Jambusar
6152	10	Dahod	Devgadh Baria	Kaliya Kota
6153	10	Dahod	Devgadh Baria	Ratadiya
6154	10	Dahod	Devgadh Baria	Sagtala
6155	10	Dahod	Devgadh Baria	Lavariya
6156	10	Dahod	Devgadh Baria	Zamran
6157	10	Dahod	Devgadh Baria	Amblipani Chhotra
6364	11	Dang	Vaghai	Barda
6365	11	Dang	Vaghai	Borpada
6366	11	Dang	Vaghai	Bondarmal
6367	11	Dang	Vaghai	Wanarchond
6460	11	Dang	Subir	Jamla
6461	11	Dang	Subir	Nishana
6462	11	Dang	Subir	Palsamal
6463	11	Dang	Subir	Jhari
6464	11	Dang	Subir	Garkhadi
6465	11	Dang	Subir	Bhondvihir
6645	12	Devbhumi Dwarka	Khambhalia	Shaktinagar
6646	12	Devbhumi Dwarka	Khambhalia	Harshadpur
6647	12	Devbhumi Dwarka	Khambhalia	Vadinar
6648	12	Devbhumi Dwarka	Khambhalia	D.Bara
6649	12	Devbhumi Dwarka	Khambhalia	Vachla Bara
6650	12	Devbhumi Dwarka	Khambhalia	Lalparda
6651	12	Devbhumi Dwarka	Khambhalia	Chudeshvar
6652	12	Devbhumi Dwarka	Khambhalia	Juni Fot
6653	12	Devbhumi Dwarka	Khambhalia	Navi Fot
6654	12	Devbhumi Dwarka	Khambhalia	Bhankhokhari
6655	12	Devbhumi Dwarka	Khambhalia	Ambardi
6656	12	Devbhumi Dwarka	Khambhalia	Laluka
6732	12	Devbhumi Dwarka	Kalyanpur	Ashiyavadar
6733	12	Devbhumi Dwarka	Kalyanpur	Sidsara
6734	12	Devbhumi Dwarka	Kalyanpur	Bankodi
6735	12	Devbhumi Dwarka	Kalyanpur	Kanpar Sherdi
6736	12	Devbhumi Dwarka	Kalyanpur	Kalyanpur
6737	12	Devbhumi Dwarka	Kalyanpur	Dhumthar
6738	12	Devbhumi Dwarka	Kalyanpur	Mangariya
6739	12	Devbhumi Dwarka	Kalyanpur	Gangdi
6740	12	Devbhumi Dwarka	Kalyanpur	Ranparda
6741	12	Devbhumi Dwarka	Kalyanpur	Chapar
6742	12	Devbhumi Dwarka	Kalyanpur	Patelka
6743	12	Devbhumi Dwarka	Kalyanpur	Khijadad
6744	12	Devbhumi Dwarka	Kalyanpur	Hadmatiya
6745	12	Devbhumi Dwarka	Kalyanpur	Virpur
6798	13	Gandhinagar	Mansa	Lakroda
6799	13	Gandhinagar	Mansa	Vijaynagar
6800	13	Gandhinagar	Mansa	Bapupura
6801	13	Gandhinagar	Mansa	Pratapnagar
6802	13	Gandhinagar	Mansa	Rajpura
6864	13	Gandhinagar	Dehgam	Anguthala

6865	13	Gandhinagar	Dehgam	Bardoli (Bariya)
6866	13	Gandhinagar	Dehgam	Khanpur
6867	13	Gandhinagar	Dehgam	Amrajina Muvada
6868	13	Gandhinagar	Dehgam	Dhamij
6869	13	Gandhinagar	Dehgam	Ahamadpur
6870	13	Gandhinagar	Dehgam	Sagdalpur
7108	14	Gir somnath	Una	Simasi
7109	14	Gir somnath	Una	Yajpur
7110	14	Gir somnath	Una	Sanakhda
7111	14	Gir somnath	Una	Kanakbarda
7112	14	Gir somnath	Una	Madhgam
7113	14	Gir somnath	Una	Kob
7114	14	Gir somnath	Una	Saiyad Rajpara
7284	14	Gir somnath	Sutrapada	Anand Para
7285	14	Gir somnath	Sutrapada	Sundarpara
7286	14	Gir somnath	Sutrapada	Padruka
7287	14	Gir somnath	Sutrapada	Moradiya
7331	14	Gir somnath	Kodinar	Nagadla Sugala
7332	14	Gir somnath	Kodinar	Arnej
7333	14	Gir somnath	Kodinar	Kadvasan
7334	14	Gir somnath	Kodinar	Ronaj
7335	14	Gir somnath	Kodinar	Mul Dwarka
7477	15	Jamnagar	Jamnagar	Amra
7478	15	Jamnagar	Jamnagar	Champa Beraja
7479	15	Jamnagar	Jamnagar	Vav Beraja
7480	15	Jamnagar	Jamnagar	Dodhiya
7481	15	Jamnagar	Jamnagar	Juna Nagna
7482	15	Jamnagar	Jamnagar	Kansumara
7483	15	Jamnagar	Jamnagar	Lavadiya
7484	15	Jamnagar	Jamnagar	Moti Bhalsan
7485	15	Jamnagar	Jamnagar	Miyatra
7486	15	Jamnagar	Jamnagar	Gangajala
7487	15	Jamnagar	Jamnagar	Naghedi
7488	15	Jamnagar	Jamnagar	Pasaya
7489	15	Jamnagar	Jamnagar	Ranjitpar
7490	15	Jamnagar	Jamnagar	Sumri Bhalsan
7491	15	Jamnagar	Jamnagar	Theba
7616	15	Jamnagar	Jamjodhpur	Moti Gop
7617	15	Jamnagar	Jamjodhpur	Meghpar
7618	15	Jamnagar	Jamjodhpur	Bhojabedi
7619	15	Jamnagar	Jamjodhpur	Sukhpar Dhrafa
7620	15	Jamnagar	Jamjodhpur	Son Vadiya
7621	15	Jamnagar	Jamjodhpur	Hothiji Khadba
7622	15	Jamnagar	Jamjodhpur	Nandana
7623	15	Jamnagar	Jamjodhpur	Sogthi
7624	15	Jamnagar	Jamjodhpur	Bharad Moti
7625	15	Jamnagar	Jamjodhpur	Butavadar
7626	15	Jamnagar	Jamjodhpur	Gingni
7627	15	Jamnagar	Jamjodhpur	Malvada
7683	15	Jamnagar	Kalavad	Bhayu Khakhariya
7684	15	Jamnagar	Kalavad	Chapra

7685	15	Jamnagar	Kalavad	Kotha Bhadukiya
7686	15	Jamnagar	Kalavad	Labukiya Bhadukiya
7687	15	Jamnagar	Kalavad	Nagpur
7688	15	Jamnagar	Kalavad	Nana Panchdevda
7689	15	Jamnagar	Kalavad	Navagam
7690	15	Jamnagar	Kalavad	Navania Khakhariya
7691	15	Jamnagar	Kalavad	Pipaliya (Dhandhaliya)
7692	15	Jamnagar	Kalavad	Ravashiya
7693	15	Jamnagar	Kalavad	Shishang
7694	15	Jamnagar	Kalavad	Sortha
7695	15	Jamnagar	Kalavad	Vazir Khakhariya
7696	15	Jamnagar	Kalavad	Pithadpur
7697	15	Jamnagar	Kalavad	Deri
7858	16	Junagadh	Junagadh	Vadhavi
7859	16	Junagadh	Junagadh	Dungarpur
7860	16	Junagadh	Junagadh	Salatha
7861	16	Junagadh	Junagadh	Navagam
7862	16	Junagadh	Junagadh	Bilkha
7863	16	Junagadh	Junagadh	Avatadiya Mota
7864	16	Junagadh	Junagadh	Badalpur
7918	16	Junagadh	Bhesan	Sankrola
7919	16	Junagadh	Bhesan	Khambhaliya
7920	16	Junagadh	Bhesan	Galath
7921	16	Junagadh	Bhesan	Juni Dhari Gundali
7922	16	Junagadh	Bhesan	Chhodvadi
7923	16	Junagadh	Bhesan	Umrali
7959	16	Junagadh	Visavadar	Chhalda
7960	16	Junagadh	Visavadar	Sukhpur
7961	16	Junagadh	Visavadar	Vajdi
7962	16	Junagadh	Visavadar	Chavand Juni
7963	16	Junagadh	Visavadar	Bhat Vavdi
7964	16	Junagadh	Visavadar	Bhutdi
7965	16	Junagadh	Visavadar	Mandavad
7966	16	Junagadh	Visavadar	Monpari Nani
7967	16	Junagadh	Visavadar	Ratang
7968	16	Junagadh	Visavadar	Khambha Gir
8079	16	Junagadh	Keshod	Sarod
8080	16	Junagadh	Keshod	Jonpur
8081	16	Junagadh	Keshod	Madhda
8082	16	Junagadh	Keshod	Chandigadh
8083	16	Junagadh	Keshod	Sondarda
8084	16	Junagadh	Keshod	Kevadra
8085	16	Junagadh	Keshod	Eklera
8086	16	Junagadh	Keshod	Rangpur
8259	16	Junagadh	Manavadar	Chudva
8260	16	Junagadh	Manavadar	Samega
8261	16	Junagadh	Manavadar	Sanosra
8262	16	Junagadh	Manavadar	Dagad
8263	16	Junagadh	Manavadar	Nakra
8264	16	Junagadh	Manavadar	Katakpara
8265	16	Junagadh	Manavadar	Mandodra

8266	16	Junagadh	Manavadar	Ambaliya
8267	16	Junagadh	Manavadar	Bhadula
8371	17	Kheda	Kapadvanj	Nirmali
8372	17	Kheda	Kapadvanj	Aboch
8373	17	Kheda	Kapadvanj	Vyasvasana
8374	17	Kheda	Kapadvanj	Thavad
8375	17	Kheda	Kapadvanj	Reliya
8376	17	Kheda	Kapadvanj	Taiyabpura
8377	17	Kheda	Kapadvanj	Shelgadh
8378	17	Kheda	Kapadvanj	Shinghali
8379	17	Kheda	Kapadvanj	Malidai ba bhag
8380	17	Kheda	Kapadvanj	Hirapura
8466	17	Kheda	Mehmedabad	Hathnoli
8467	17	Kheda	Mehmedabad	Sadara
8468	17	Kheda	Mehmedabad	Sinhuj
8469	17	Kheda	Mehmedabad	Kesara
8470	17	Kheda	Mehmedabad	Amrapura
8541	17	Kheda	Kheda	Vadala
8542	17	Kheda	Kheda	Varsang
8543	17	Kheda	Kheda	Khumarvad
8544	17	Kheda	Kheda	Govindpura
8631	17	Kheda	Mahudha	Miyapur
8632	17	Kheda	Mahudha	Singhali
8633	17	Kheda	Mahudha	Nizampura
8634	17	Kheda	Mahudha	Nanikhadol
8833	17	Kheda	Vaso	Pij
8834	17	Kheda	Vaso	Thaledi
8835	17	Kheda	Vaso	Petli
8889	18	Kuch	Bhuj	Kotda Ugamana
8890	18	Kuch	Bhuj	Chubdak
8891	18	Kuch	Bhuj	Vadvara
8892	18	Kuch	Bhuj	Naliyeri Timbo
8893	18	Kuch	Bhuj	Dharampur
8894	18	Kuch	Bhuj	Kharod
8895	18	Kuch	Bhuj	Kunariya (Jam)
8896	18	Kuch	Bhuj	Daddhar Nani
9090	18	Kuch	Mandvi	Dhindh
9091	18	Kuch	Mandvi	Mota Goniyasar
9092	18	Kuch	Mandvi	Bheraiya
9093	18	Kuch	Mandvi	Rajpar
9094	18	Kuch	Mandvi	Vindh Timbo
9095	18	Kuch	Mandvi	Bhada
9096	18	Kuch	Mandvi	Don
9097	18	Kuch	Mandvi	Bhadai Nani
9337	18	Kuch	Bhachau	Moti Chirai
9338	18	Kuch	Bhachau	Manfara
9339	18	Kuch	Bhachau	Kalyanpar
9340	18	Kuch	Bhachau	Bapuari
9341	18	Kuch	Bhachau	Ratanpar
9342	18	Kuch	Bhachau	Amarapar
9343	18	Kuch	Bhachau	Jadsa

9344	18	Kuch	Bhachau	Nara
9345	18	Kuch	Bhachau	Vasatva
9346	18	Kuch	Bhachau	Navakatariya
9347	18	Kuch	Bhachau	Toraniya
9348	18	Kuch	Bhachau	Lunva
9349	18	Kuch	Bhachau	Vondhada
9506	18	Kuch	Rapar	Chitrod
9507	18	Kuch	Rapar	Kanmer
9508	18	Kuch	Rapar	Selari
9509	18	Kuch	Rapar	Lodrani
9510	18	Kuch	Rapar	Surba Vandh
9511	18	Kuch	Rapar	Kalyanpar
9512	18	Kuch	Rapar	Vrajvani
9513	18	Kuch	Rapar	Bhimdevka
9514	18	Kuch	Rapar	Nanda
9515	18	Kuch	Rapar	Gavaripar
9516	18	Kuch	Rapar	Vanoi Vandh
9517	18	Kuch	Rapar	Rampar
9757	18	Kuch	Abdasa	Chhachhi
9758	18	Kuch	Abdasa	Vandi Moti
9759	18	Kuch	Abdasa	Dhufi Moti
9760	18	Kuch	Abdasa	Pat
9761	18	Kuch	Abdasa	Aamravandh
9762	18	Kuch	Abdasa	NotiyarVandh
9913	19	Mahisagar	Lunawada	Ankalwa
9914	19	Mahisagar	Lunawada	Vaniyavala Gorada
9915	19	Mahisagar	Lunawada	Bhulakhantni Muvada
9916	19	Mahisagar	Lunawada	Simalia
9917	19	Mahisagar	Lunawada	Lalsar
9918	19	Mahisagar	Lunawada	Khoda Amba
10237	19	Mahisagar	Santrampur	Mota Sarnaiya
10238	19	Mahisagar	Santrampur	Janvad
10239	19	Mahisagar	Santrampur	Sukatimba
10240	19	Mahisagar	Santrampur	Moralnaka
10241	19	Mahisagar	Santrampur	Kalibel Navi
10242	19	Mahisagar	Santrampur	Thambha
10243	19	Mahisagar	Santrampur	Ambaliyat
10753	20	Mehsana GP	Becharaji	Dedarda
10754	20	Mehsana GP	Becharaji	Mahadevpura
10755	20	Mehsana GP	Becharaji	Edala
10809	20	Mehsana GP	Mahesana	Taleti
10810	20	Mehsana GP	Mahesana	Dhanpura
10811	20	Mehsana GP	Mahesana	Nadasa
10812	20	Mehsana GP	Mahesana	Abasana
10813	20	Mehsana GP	Mahesana	Gokalgadh
10814	20	Mehsana GP	Mahesana	Mitha
10994	20	Mehsana GP	Kadi	Korda
10995	20	Mehsana GP	Kadi	Kaiyal
10996	20	Mehsana GP	Kadi	Kundal
10997	20	Mehsana GP	Kadi	Pirojpur
10998	20	Mehsana GP	Kadi	Bavlu
10999	20	Mehsana GP	Kadi	Haripura

11000	20	Mehsana GP	Kadi	Manknaj
11148	20	Mehsana GP	Satlasana	Vasai
11149	20	Mehsana GP	Satlasana	Mumanvas
11150	20	Mehsana GP	Satlasana	Bhimpur
11213	20	Mehsana GP	Visnagar	Pudgam
11214	20	Mehsana GP	Visnagar	Basana
11215	20	Mehsana GP	Visnagar	Khandosan
11216	20	Mehsana GP	Visnagar	Udalpur
11217	20	Mehsana GP	Visnagar	Tarabh
11400	21	Morbi	morbi	Andarna
11401	21	Morbi	morbi	Jambudiya
11402	21	Morbi	morbi	Jepur
11403	21	Morbi	morbi	Jivapar Chakampar
11404	21	Morbi	morbi	Manekvada
11405	21	Morbi	morbi	Naranka
11406	21	Morbi	morbi	Pipali
11407	21	Morbi	morbi	Rajpar
11408	21	Morbi	morbi	Rangpar
11409	21	Morbi	morbi	Ravapar Nadi
11410	21	Morbi	morbi	Untbet-Shampar
11411	21	Morbi	morbi	Zinkiyali
11412	21	Morbi	morbi	Bhaktinagar
11545	21	Morbi	Halvad	Ajitgadh
11546	21	Morbi	Halvad	Bhalgamda
11547	21	Morbi	Halvad	Devipur
11548	21	Morbi	Halvad	Dungarpur
11549	21	Morbi	Halvad	Golasan
11550	21	Morbi	Halvad	Ingorala
11551	21	Morbi	Halvad	Khod
11552	21	Morbi	Halvad	Mangadh
11553	21	Morbi	Halvad	Nava Devaliya
11554	21	Morbi	Halvad	Nava Ghatila
11555	21	Morbi	Halvad	Pandatirath
11556	21	Morbi	Halvad	Pratapagadh
11557	21	Morbi	Halvad	Sarambhada
11558	21	Morbi	Halvad	Vegadvav
11559	21	Morbi	Halvad	Ishwarnagar
11614	21	Morbi	tankara	Dhroliya
11615	21	Morbi	tankara	Ghunada Khanpar
11616	21	Morbi	tankara	Otala
11617	21	Morbi	tankara	Rajavad
11618	21	Morbi	tankara	Rohishala
11619	21	Morbi	tankara	Savdi
11620	21	Morbi	tankara	Haripar
11621	21	Morbi	tankara	Ganeshpar
11659	22	Narmada	Nandod	Amarpara
11660	22	Narmada	Nandod	Gopalpura
11661	22	Narmada	Nandod	Navagam (Ram)
11662	22	Narmada	Nandod	Jitgadh
11663	22	Narmada	Nandod	Dhochaki
11664	22	Narmada	Nandod	Nana Haidava
11665	22	Narmada	Nandod	Poicha

11666	22	Narmada	Nandod	Rajuvadiya
11865	22	Narmada	Dediapada	Rukhala
11866	22	Narmada	Dediapada	Idalavi
11867	22	Narmada	Dediapada	Khatama
11868	22	Narmada	Dediapada	Kokam
12122	22	Narmada	Tilakwada	sevada
12123	22	Narmada	Tilakwada	marudhiya
12124	22	Narmada	Tilakwada	agar
12431	23	Navsari	Chikhli	Undhwal
12432	23	Navsari	Chikhli	Harangam
12433	23	Navsari	Chikhli	Ghekti
12434	23	Navsari	Chikhli	Amadhara
12483	23	Navsari	Bansda	Palgabhan
12484	23	Navsari	Bansda	Navtad
12485	23	Navsari	Bansda	Kapadvanj
12486	23	Navsari	Bansda	Manpur
12487	23	Navsari	Bansda	Khadakiya
12488	23	Navsari	Bansda	Mindhabari
12489	23	Navsari	Bansda	Kavdej
12490	23	Navsari	Bansda	Kanadha
12612	24	Panchmahal	Godhra	Nadisar
12613	24	Panchmahal	Godhra	Chikhodra
12614	24	Panchmahal	Godhra	Gadh
12615	24	Panchmahal	Godhra	Ladpur
12616	24	Panchmahal	Godhra	Sankali
12985	24	Panchmahal	Ghoghamba	Kalsar
12986	24	Panchmahal	Ghoghamba	Ghoghamba
12987	24	Panchmahal	Ghoghamba	Kanpur
12988	24	Panchmahal	Ghoghamba	Rinchhwani
12989	24	Panchmahal	Ghoghamba	Chathi
13086	24	Panchmahal	Shehera	Chari
13087	24	Panchmahal	Shehera	Khuntkhar
13088	24	Panchmahal	Shehera	Bamroli Bujarg
13089	24	Panchmahal	Shehera	N. Sajivav
13090	24	Panchmahal	Shehera	Balujina Mu
13091	24	Panchmahal	Shehera	Mangalpur
13092	24	Panchmahal	Shehera	Zoz
13235	25	Patan	Patan	Derasana
13236	25	Patan	Patan	Kharivavdi
13237	25	Patan	Patan	Katpur
13238	25	Patan	Patan	Hajipur
13239	25	Patan	Patan	Kuder
13298	25	Patan	Saraswati	Khareda
13299	25	Patan	Saraswati	Untvada
13300	25	Patan	Saraswati	Delvada
13301	25	Patan	Saraswati	Sotavad
13302	25	Patan	Saraswati	Bhutiya Vasna
13303	25	Patan	Saraswati	Gulvasna
13304	25	Patan	Saraswati	Kuntavada
13375	25	Patan	Sidhpur	Rasulpur
13376	25	Patan	Sidhpur	Dhanpura
13377	25	Patan	Sidhpur	Kaleda

13378	25	Patan	Sidhpur	Chatavada
13379	25	Patan	Sidhpur	Umru
13506	25	Patan	Harij	Ravindra
13507	25	Patan	Harij	Khakhdi
13508	25	Patan	Harij	Tamboliya
13509	25	Patan	Harij	Vaghel
13510	25	Patan	Harij	Chabkha
13776	26	Porbandar	Porbandar	Advana
13777	26	Porbandar	Porbandar	Bhavapara
13778	26	Porbandar	Porbandar	Paravada
13779	26	Porbandar	Porbandar	Khistri
13780	26	Porbandar	Porbandar	Shrinagar
13781	26	Porbandar	Porbandar	Keshod -lushada
13782	26	Porbandar	Porbandar	Mocha
13880	26	Porbandar	Kutiyana	Mohabatpara
13881	26	Porbandar	Kutiyana	Hamadpara
13882	26	Porbandar	Kutiyana	Choliyana
13883	26	Porbandar	Kutiyana	Kavalka
13884	26	Porbandar	Kutiyana	Zamra
13931	27	Rajkot	Dhoraji	Umarkot
13932	27	Rajkot	Dhoraji	Vegdi
13933	27	Rajkot	Dhoraji	Hadmatiya
13934	27	Rajkot	Dhoraji	Nagalkhada
13935	27	Rajkot	Dhoraji	Nani Marad
13936	27	Rajkot	Dhoraji	Bhader
13937	27	Rajkot	Dhoraji	Moti Parabdi
	27	Rajkot	Dhoraji	Moti Marad
13955	27	Rajkot	Gondal	Kantoliya
13956	27	Rajkot	Gondal	Gomta
13957	27	Rajkot	Gondal	Padavala
13958	27	Rajkot	Gondal	Daliya
13959	27	Rajkot	Gondal	Nagadka
13960	27	Rajkot	Gondal	Pipaliya
13961	27	Rajkot	Gondal	Patidad
13962	27	Rajkot	Gondal	Panchiyavadar
13963	27	Rajkot	Gondal	Biliyala
13964	27	Rajkot	Gondal	Mota Dadva
13965	27	Rajkot	Gondal	Mota Umvada
13966	27	Rajkot	Gondal	Lilakha
13967	27	Rajkot	Gondal	Lunivav
13968	27	Rajkot	Gondal	Vachhra
13969	27	Rajkot	Gondal	Shivrajgadh
14193	27	Rajkot	Jetpur	Amrapar
14194	27	Rajkot	Jetpur	Khajuri Gundala
14195	27	Rajkot	Jetpur	Jetalsar Junction
14196	27	Rajkot	Jetpur	Juni Sankali
14197	27	Rajkot	Jetpur	Thana Galol
14198	27	Rajkot	Jetpur	Dedarva
14199	27	Rajkot	Jetpur	Mevasa
14200	27	Rajkot	Jetpur	Rabarika
14201	27	Rajkot	Jetpur	Lunagiri
14202	27	Rajkot	Jetpur	Rupavati

14320	27	Rajkot	Paddhari	Hadmatiya
14321	27	Rajkot	Paddhari	Khokhri
14322	27	Rajkot	Paddhari	Rampar Pati
14323	27	Rajkot	Paddhari	Vachli Ghodi
14324	27	Rajkot	Paddhari	Intala Nana
14325	27	Rajkot	Paddhari	Amreli
14326	27	Rajkot	Paddhari	Ishvariya
14378	27	Rajkot	Rajkot	Hirasar
14379	27	Rajkot	Rajkot	Ranpar
14380	27	Rajkot	Rajkot	Lothada
14381	27	Rajkot	Rajkot	Lampasari
14382	27	Rajkot	Rajkot	Surya Rampara
14383	27	Rajkot	Rajkot	Saypar
14384	27	Rajkot	Rajkot	Sokhada
14385	27	Rajkot	Rajkot	Rajgadh
14386	27	Rajkot	Rajkot	Fadadang
14387	27	Rajkot	Rajkot	Gadhka
14388	27	Rajkot	Rajkot	Lili Sajadiali
14389	27	Rajkot	Rajkot	Targhadiya
14467	27	Rajkot	Upleta	Nava Kalaria
14468	27	Rajkot	Upleta	Khakhi Jalia
14469	27	Rajkot	Upleta	Khirsara
14470	27	Rajkot	Upleta	Charelia
14471	27	Rajkot	Upleta	Navapara
14472	27	Rajkot	Upleta	Nagvadar
14473	27	Rajkot	Upleta	Paneli
14474	27	Rajkot	Upleta	Rajpara
14475	27	Rajkot	Upleta	Samadhiyala
14476	27	Rajkot	Upleta	Sajdiyali
14477	27	Rajkot	Upleta	Hadfodi
14518	28	Sabarkantha	Khedbrahma	Dholivav
14519	28	Sabarkantha	Khedbrahma	Jagannathpura
14520	28	Sabarkantha	Khedbrahma	Changod
14521	28	Sabarkantha	Khedbrahma	Nana Baval
14709	28	Sabarkantha	Idar	Kapoda
14710	28	Sabarkantha	Idar	Kanpur
14711	28	Sabarkantha	Idar	Kishorgadh
14712	28	Sabarkantha	Idar	Ravol
14713	28	Sabarkantha	Idar	Chandap
14714	28	Sabarkantha	Idar	Ganeshpura
14715	28	Sabarkantha	Idar	Pataliya
14716	28	Sabarkantha	Idar	Kamboya
14717	28	Sabarkantha	Idar	Sundarpur
14718	28	Sabarkantha	Idar	Bolundra
14719	28	Sabarkantha	Idar	Laloda
14720	28	Sabarkantha	Idar	Vadiyavir
14721	28	Sabarkantha	Idar	Sherpur
14722	28	Sabarkantha	Idar	Panchgamda
14723	28	Sabarkantha	Idar	Aroda
14850	28	Sabarkantha	Talod	Gobarjini Muvadi
14851	28	Sabarkantha	Talod	Jorajini Muvadi
14852	28	Sabarkantha	Talod	Rojhad
15081	28	Sabarkantha	Himatnagar	Mahadevpura (Lolasan)

15082	28	Sabarkantha	Himatnagar	Kanada
15083	28	Sabarkantha	Himatnagar	Ambavada
15084	28	Sabarkantha	Himatnagar	Mordungra
15085	28	Sabarkantha	Himatnagar	Nadri
15086	28	Sabarkantha	Himatnagar	Dhuleta
15544	29	Surat	MANDVI	Jamkui
15545	29	Surat	MANDVI	Munjlav
15546	29	Surat	MANDVI	Kakdapar
15677	29	Surat	Mangarol	Dholikui
15678	29	Surat	Mangarol	Panetha
15679	29	Surat	Mangarol	Kansali
15769	29	Surat	Umarapada	Chakra
15770	29	Surat	Umarapada	Zarawadi
15771	29	Surat	Umarapada	Umarpada
15833	29	Surat	OLPAD	Mandroi
15834	29	Surat	OLPAD	Vadod
15835	29	Surat	OLPAD	Segwachhama
16133	30	Surendranagar	Muli	Ambardi
16134	30	Surendranagar	Muli	Kuntalpur
16135	30	Surendranagar	Muli	jasapar
16136	30	Surendranagar	Muli	Vadadhra
16137	30	Surendranagar	Muli	Danawada
16138	30	Surendranagar	Muli	Somasar
16139	30	Surendranagar	Muli	Gadhada
16140	30	Surendranagar	Muli	Khakhrala
16141	30	Surendranagar	Muli	Gadhad
16142	30	Surendranagar	Muli	Dadholiya
16143	30	Surendranagar	Muli	Dudhai
16187	30	Surendranagar	Limbdi	Mota Timbla
16188	30	Surendranagar	Limbdi	Ramrajpar
16189	30	Surendranagar	Limbdi	Gadthal
16190	30	Surendranagar	Limbdi	Nani Kathechi
16191	30	Surendranagar	Limbdi	Bhagwanpar
16192	30	Surendranagar	Limbdi	Ankewaliya
16193	30	Surendranagar	Limbdi	Dhalwana
16194	30	Surendranagar	Limbdi	Ralol
16195	30	Surendranagar	Limbdi	Devpara
16196	30	Surendranagar	Limbdi	Jaliyala
16197	30	Surendranagar	Limbdi	Kanpara
16243	30	Surendranagar	Wadhwan	Rampara
16244	30	Surendranagar	Wadhwan	Adheli
16245	30	Surendranagar	Wadhwan	Tuva
16246	30	Surendranagar	Wadhwan	Kherali
16247	30	Surendranagar	Wadhwan	Kharva
16248	30	Surendranagar	Wadhwan	Kholadiad
16249	30	Surendranagar	Wadhwan	Mota Madhad
16250	30	Surendranagar	Wadhwan	Vastadi
16251	30	Surendranagar	Wadhwan	Vaghela
16252	30	Surendranagar	Wadhwan	Kariyani
16253	30	Surendranagar	Wadhwan	Khamisana
16254	30	Surendranagar	Wadhwan	Rajpar
16255	30	Surendranagar	Wadhwan	Mulchand

16288	30	Surendranagar	Lakhtar	Babajipara
16289	30	Surendranagar	Lakhtar	Jyotipura
16290	30	Surendranagar	Lakhtar	Bhathariya
16291	30	Surendranagar	Lakhtar	Devaliya
16292	30	Surendranagar	Lakhtar	Kalam
16293	30	Surendranagar	Lakhtar	Kalyanpara
16294	30	Surendranagar	Lakhtar	Sadad
16295	30	Surendranagar	Lakhtar	Talsana
16296	30	Surendranagar	Lakhtar	Vadekhan
16297	30	Surendranagar	Lakhtar	Vana
16298	30	Surendranagar	Lakhtar	Lakhtar
16331	30	Surendranagar	Dhrangadhra	Kuda
16332	30	Surendranagar	Dhrangadhra	Kondh
16333	30	Surendranagar	Dhrangadhra	Kankavati
16334	30	Surendranagar	Dhrangadhra	Gajanvav
16335	30	Surendranagar	Dhrangadhra	Chuli
16336	30	Surendranagar	Dhrangadhra	Dudapur
16337	30	Surendranagar	Dhrangadhra	Dhrumath
16338	30	Surendranagar	Dhrangadhra	Pipala
16339	30	Surendranagar	Dhrangadhra	Bharad
16340	30	Surendranagar	Dhrangadhra	Methan
16341	30	Surendranagar	Dhrangadhra	Ratanpar
16342	30	Surendranagar	Dhrangadhra	Rampara
16343	30	Surendranagar	Dhrangadhra	Ravaliyavadar
16344	30	Surendranagar	Dhrangadhra	Sarval
16345	30	Surendranagar	Dhrangadhra	Sajjanpur
16346	30	Surendranagar	Dhrangadhra	Sultanpur
16347	30	Surendranagar	Dhrangadhra	Hampar
16610	31	Tapi	Vyara	Chikhalvav
16611	31	Tapi	Vyara	Paniyari
16612	31	Tapi	Vyara	Bhatpur
16613	31	Tapi	Vyara	Kanjan
16614	31	Tapi	Vyara	Jhankhari
16615	31	Tapi	Vyara	Katkui
16616	31	Tapi	Vyara	Raniamba
16701	31	Tapi	Songadh	Balamrai
16702	31	Tapi	Songadh	Vadpada P Tokarva
16703	31	Tapi	Songadh	Chorvad
16704	31	Tapi	Songadh	otatokarva
16705	31	Tapi	Songadh	Amthava
16706	31	Tapi	Songadh	Mandal
17280	32	Vadodara	Vadodara	Talsat
17281	32	Vadodara	Vadodara	Vasana (Kotariya)
17282	32	Vadodara	Vadodara	Samiyala
17283	32	Vadodara	Vadodara	Hasapura
17522	32	Vadodara	Dabhoi	Asodara
17523	32	Vadodara	Dabhoi	Suvalaja
17524	32	Vadodara	Dabhoi	Lingsthali
17525	32	Vadodara	Dabhoi	Motahabipura
17526	32	Vadodara	Dabhoi	Manpura
17527	32	Vadodara	Dabhoi	Pansoli
17528	32	Vadodara	Dabhoi	Shankerpura

17529	32	Vadodara	Dabhoi	vadhavana
17640	32	Vadodara	sinor	Bhakada
17641	32	Vadodara	sinor	Malpur
17642	32	Vadodara	sinor	Kukas
17643	32	Vadodara	sinor	Tiglod
17682	32	Vadodara	Karjan	Khandha
17683	32	Vadodara	Karjan	Sampa
17684	32	Vadodara	Karjan	Alampura
17685	32	Vadodara	Karjan	Sansrod
17686	32	Vadodara	Karjan	Sayar
17687	32	Vadodara	Karjan	Dhavat
17688	32	Vadodara	Karjan	Bharthali
17775	33	Valsad	Valsad	Ghadoi
17776	33	Valsad	Valsad	Sarodhi
17777	33	Valsad	Valsad	Sonwada
17778	33	Valsad	Valsad	Vadhiyar
17928	33	Valsad	Pardi	Paria
17929	33	Valsad	Pardi	Udwada
17930	33	Valsad	Pardi	Fual -54
18117	33	Valsad	Kaprada	Amba Jungle
18118	33	Valsad	Kaprada	Mani
18119	33	Valsad	Kaprada	Sutharpada
18120	33	Valsad	Kaprada	Jam Gabhan
18121	33	Valsad	Kaprada	Shahuda
		Grand Total		900

ગામ મોજણીની પ્રશ્નાવલી - ૧ : ગામમાં પસંદ થયેલ ૧૦૦ સર્વે નંબરની મોજણી

Enumeration of parcels/farmers households / સર્વે નંબર મુહજબ ૧૦૦ ખેડૂતોની ગામ મોજણી

Name of Village: ગામનું નામઃ _____ Tehsil/Taluka/**તાલુકો** : _____

District/**જીલ્લો** : _____

S.No. / ક્રમ	Selected survey number / સર્વે નંબર	Total area of selected survey number (ha) / સર્વે નંબર હેઠળ વિસ્તાર (હે.)	Full farmer name / કુલ ખેડૂતનું નામ	Crop grown in current season- kharif / **ખરીફ** પાકની વાવણી / રોપણી*					
				Crop -1 / **પાક ૧:**			Crop -2: / **પાક ૨:**		
				S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)	S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)
1	2	3	4	5	6	7	8	9	10
1									
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*ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, ઘઉં, તુવેર, મગ, અડદ, ચણા, મગફળી, તલ, રાયડો

ગામ મોજણીની પ્રશ્નાવલી - ૧ : ગામમાં પસંદ થયેલ ૧૦૦ સર્વે નંબરની મોજણી

Enumeration of parcels/farmers households / સર્વે નંબર મુહજબ ૧૦૦ ખેડૂતોની ગામ મોજણી

Name of Village: ગામનું નામઃ _____ Tehsil/Taluka/**તાલુકો** : _____

District/**જીલ્લો** : _____

S.No. / કમ	Crop grown in current season- kharif / ખરીફ પાકની વાવણી / રોપણી*								
	Crop -3 / પાક ૩:			Crop -4 / પાક ૪:			Crop -5 / પાક ૫:		
	S.No. /કમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)	S.No. /કમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)	S.No. /કમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)
1	11	12	13	14	15	16	17	18	19
1									
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*ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, ઘઉં, તુવેર, મગ, અડદ, ચણા, મગફળી, તલ, રાયડો

ગામ મોજણીની પ્રશ્નાવલી - ૧ : ગામમાં પસંદ થયેલ ૧૦૦ સર્વે નંબરની મોજણી

Enumeration of parcels/farmers households / સર્વે નંબર મુહજબ ૧૦૦ ખેડૂતોની ગામ મોજણી

Name of Village: ગામનું નામ: _____ Tehsil/Taluka/તાલુકો : _____

District/જીલ્લો : _____

S.No. / ક્રમ	Crop grown in current season- kharif / રવિ પાકની વાવણી *						Other Crop grown in the year / અન્ય પાકોની વિગત**	
	Crop -1 / પાક ૧:			Crop -1 / પાક ૨:			Crop s/ અન્ય પાકો	
	S.No. / ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated પિયત હેઠળ વિસ્તાર)	S.No. / ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated પિયત હેઠળ વિસ્તાર)	Crop/s Name અન્ય પાકોના નામ	Area sown ha વિસ્તાર (હે.)
1	18	20	21	22	24	25	22	24
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** અન્ય પાકો કૈસં સિવાયના બધા પાકો (ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, ઘઉં, તુવેર, મગ, અડદ, ચણા, મગફળી, તલ, રાયડો)

ગામ મોજણીની પ્રશ્નાવલી - ૧ : ગામમાં પસંદ થયેલ ૧૦૦ સર્વે નંબરની મોજણી

Enumeration of parcels/farmers households / સર્વે નંબર મુહજબ ૧૦૦ ખેડૂતોની ગામ મોજણી

Name of Village: ગામનું નામ: _____ Tehsil/Taluka/તાલુકો : _____

District/જીલ્લો : _____

S.No. / ક્રમ	Selected survey number / સર્વે નંબર	Total area of selected survey number (ha) / સર્વે નંબર હેઠળ વિસ્તાર (હે.)	Full farmer name / ફુલ ખેડૂતનું નામ	Crop grown in current season- kharif / ખરીફ પાકની વાવણી / રોપણી*					
				Crop -1 / પાક ૧:			Crop -2: / પાક ૨:		
				S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)	S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)
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*ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, ઘઉં, તુવેર, મગ, અડદ, ચણા, મગફળી, તલ, રાયડો

ગામ મોજણીની પ્રશ્નાવલી - ૧ : ગામમાં પસંદ થયેલ ૧૦૦ સર્વે નંબરની મોજણી

Enumeration of parcels/farmers households / સર્વે નંબર મુહજબ ૧૦૦ ખેડૂતોની ગામ મોજણી

Name of Village: ગામનું નામઃ _____ Tehsil/Taluka/**તાલુકો** : _____

District/**જીલ્લો** : _____

S.No. / ક્રમ	Crop grown in current season- kharif / ખરીફ પાકની વાવણી / રોપણી*								
	Crop -3 / પાક ૩:			Crop -4 / પાક ૪:			Crop -5 / પાક ૫:		
	S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)	S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)	S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)
1	11	12	13	14	15	16	17	18	19
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*ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, ઘઉં, તુવેર, મગ, અડદ, ચણા, મગફળી, તલ, રાયડો

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ગામ મોજણીની પ્રશ્નાવલી - ૧ : ગામમાં પસંદ થયેલ ૧૦૦ સર્વે નંબરની મોજણી

Enumeration of parcels/farmers households / સર્વે નંબર મુહજબ ૧૦૦ ખેડૂતોની ગામ મોજણી

Name of Village: ગામનું નામ: _____ Tehsil/Taluka/તાલુકો : _____

District/જીલ્લો : _____

S.No. / ક્રમ	Crop grown in current season- kharif / રવિ પાકની વાવણી *						Other Crop grown in the year / અન્ય પાકોની વિગત**	
	Crop -1 / પાક ૧:			Crop -1 / પાક ૨:			Crop s/ અન્ય પાકો	
	S.No. / ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated પિયત હેઠળ વિસ્તાર)	S.No. / ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated પિયત હેઠળ વિસ્તાર)	Crop/s Name અન્ય પાકોના નામ	Area sown ha વિસ્તાર (હે.)
1	18	20	21	22	24	25	22	24
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** અન્ય પાકો કૈસં સિવાયના બધા પાકો (ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, ઘઉં, તુવેર, મગ, અડદ, ચણા, મગફળી, તલ, રાયડો)

ગામ મોજણીની પ્રશ્નાવલી - ૧ : ગામમાં પસંદ થયેલ ૧૦૦ સર્વે નંબરની મોજણી

Enumeration of parcels/farmers households / સર્વે નંબર મુહજબ ૧૦૦ ખેડૂતોની ગામ મોજણી

Name of Village: ગામનું નામઃ _____ Tehsil/Taluka/**તાલુકો** : _____

District/**જીલ્લો** : _____

S.No. / ક્રમ	Selected survey number / સર્વે નંબર	Total area of selected survey number (ha) / સર્વે નંબર હેઠળ વિસ્તાર (હે.)	Full farmer name / કુલ ખેડૂતનું નામ	Crop grown in current season- kharif / ખરીફ પાકની વાવણી / રોપણી*					
				Crop -1 / પાક ૧:			Crop -2: / પાક ૨:		
				S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)	S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)
1	2	3	4	5	6	7	8	9	10
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75									
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90									
91									
92									
93									
94									
95									
96									
97									
98									
99									
100									

*ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, ઘઉં, તુવેર, મગ, અડદ, ચણા, મગફળી, તલ, રાયડો

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ગામ મોજણીની પ્રશ્નાવલી - ૧ : ગામમાં પસંદ થયેલ ૧૦૦ સર્વે નંબરની મોજણી

Enumeration of parcels/farmers households / સર્વે નંબર મુહજબ ૧૦૦ ખેડૂતોની ગામ મોજણી

Name of Village: ગામનું નામ: _____ Tehsil/Taluka/તાલુકો : _____

District/જીલ્લો : _____

S.No. / ક્રમ	Crop grown in current season- kharif / ખરીફ પાકની વાવણી / રોપણી*								
	Crop -3 / પાક ૩:			Crop -4 / પાક ૪:			Crop -5 / પાક ૫:		
	S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)	S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)	S.No. /ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated (પિયત હેઠળ વિસ્તાર)
1	11	12	13	14	15	16	17	18	19
69									
70									
71									
72									
73									
74									
75									
76									
77									
78									
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82									
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92									
93									
94									
95									
96									
97									
98									
99									
100									

*ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, ઘઉં, તુવેર, મગ, અડદ, ચણા, મગફળી, તલ, રાયડો

ગામ મોજણીની પ્રશ્નાવલી - ૧ : ગામમાં પસંદ થયેલ ૧૦૦ સર્વે નંબરની મોજણી

Enumeration of parcels/farmers households / સર્વે નંબર મુહજબ ૧૦૦ ખેડૂતોની ગામ મોજણી

Name of Village: ગામનું નામ: _____ Tehsil/Taluka/તાલુકો : _____

District/જીલ્લો : _____

S.No. / ક્રમ	Crop grown in current season- kharif / રવિ પાકની વાવણી *						Other Crop grown in the year / અન્ય પાકોની વિગત**	
	Crop -1 / પાક ૧:			Crop -1 / પાક ૨:			Crop s/ અન્ય પાકો	
	S.No. / ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated પિયત હેઠળ વિસ્તાર)	S.No. / ક્રમ	Area sown ha વિસ્તાર (હે.)	Area under Irrigated પિયત હેઠળ વિસ્તાર)	Crop/s Name અન્ય પાકોના નામ	Area sown ha વિસ્તાર (હે.)
1	18	20	21	22	24	25	22	24
69								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
80								
81								
82								
83								
84								
85								
86								
87								
88								
89								
90								
91								
92								
93								
94								
95								
96								
97								
98								
99								
100								

** અન્ય પાકો કૈસં સિવાયના બધા પાકો (ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, ઘઉં, તુવેર, મગ, અડદ, ચણા, મગફળી, તલ, રાયડો)

Pilot study for developing state level estimates of crop area and production on the basis of sample size recommended by Professor Vaidyanathan Committee report

CCE Schedule I: Particulars of parcels selected for crop cutting experiments
સીસીઇ પ્રશ્નાવલી - ૧ : પસંદ કરેલ સર્વે નંબરના **ખરીફ** પાકની કાપણીના અખતરાની વિગત
(ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, તુવેર, મગ, અડદ, મગફળી, તલ)

Note / નોંધ :

1. Fill up the schedule on the day of selection of survey number at least **one month before** start of crop harvest. /

૧. માહિતી મેળવવાની તારીખથી એક માસ પહેલા પાકની કાપણી / લણણી શરૂ થયેલ હોય તેવા પસંદ થયેલ સર્વે નંબરની માહિતી ભરો.

2. Respond to every item, if any information is not available, write 'not available'. Tick appropriate item where choices are provided. /

૩. દરેક માહિતી મેળવવાની રહેશે, જે માહિતી ન મળે તે જગ્યાએ " માહિતી નથી" તેમ દર્શાવવું. એકથી વધુ વિકલ્પો હોય ત્યારે યોગ્ય વિકલ્પની પસંદગી કરવી.

1.0 Particulars of the village / ગામની વિગત

S.l. /ક્રમ	Items / બાબત	Information / માહિતી
1.1	Agril. Year / કૃષિ વર્ષ	
1.2	Agril. Season / કૃષિ ઋતુ	
1.3	District / જીલ્લો	
1.4	Taluk/tehsil/circle / તાલુકો	
1.5	CD Block / સીડી બ્લોક	
1.6	Village / ગામ	
1.7	Name of crop / પાકનું નામ	
1.8	Date of visit to the village / ગામની મુલાકાત તારીખ	
1.9	Total survey/dag number or total farmer households (HH) in the village / ગામનાં કુલ ખેડૂત કુટુંબોની સંખ્યા	
1.10	Total number of survey/dags or farmer households selected out of hundred growing the particular crop under this study (from Table C of Schedule 1) / ગામમાં ૧૦૦ ખેડૂતોમાંથી અભ્યાસનો પાક પકવતાં ખેડૂતોની સંખ્યા	

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2.0 Selection of Fields for Kharif Crop / ખરીફ અખતરા પાક માટે ખેતરની પસંદગી

ગામમાનાં મુખ્ય ધાન્ય અને કઠોર પાક કૈંસમા દશાચિલ માથી લેવાના રહેશે - (ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, તુવેર, મગ, અડદ, મગફ઼ળી, તલ)

S.l. કમ	Items વિગત	Experiment પ્રયોગ / અખતરો			
		Crop 1/ પાક ૧ નું નામ		Crop 2/ પાક ૨ નું નામ	
		Plot I પ્લોટ ૧	Plot II પ્લોટ ૨	Plot I પ્લોટ ૧	Plot II પ્લોટ ૨
1	2	3	4	5	6
2.1	Random number selected for selection of survey no. for CCE યાદચ્છિક રીતે પસંદ થયેલ કમ નંબર દર્શાવો				
2.2	Number of survey no. corresponding to selected random number / પસંદ થયેપ સર્વે નંબર દર્શાવો				
2.3	Reason for rejection of the survey numbers, if any / સર્વે નંબર ન પસંદ કરવાનું કારણો (છોડી દેવાં)				
2.4	If rejected, new random number for selection of survey no. for CCE / નવા સર્વે નંબરની યાદચ્છિક પસંદગી નંબર				
2.5	Number of survey no. corresponding to newly selected random number / નવો પસંદ થયેપ સર્વે નંબર દર્શાવો				
2.6	Survey number finally selected / અંતિમ તબક્કે પસંદ કરેલ સર્વે નંબર લખો				
2.7	Number of fields in the selected survey/dag number પસંદ થયેલ સર્વેનાં ફિલ્ડ/ પ્લોટ (ખેતરો) ની સંખ્યા.				
2.8	Field number nearest to South West Corner of the selected Survey/dag Number / દક્ષિણ -પશ્ચિમ ખૂણાંનો પસંદ થયેલ ખેતર/ પ્લોટનો વિસ્તાર દર્શાવો				
2.9	Area of finally selected field nearest to South West Corner of the selected Survey/dag Number (ha) / અંતિમ તબક્કે પસંદ થયેલ દક્ષિણ -પશ્ચિમ ખૂણાંના પ્લોટનો વિસ્તાર (હે.)				
2.10	Name of the farmer of the selected field and his father's name / પસંદ થયેલ ખેતરનાં ખેડૂત નું નામ				
2.11	Age of the farmer (Year) / ખેડૂતની ઉમંર (વર્ષમાં)				
2.12	Sex of the farmer (Male/Female) / ખેડૂતની જાતિ (પુરુષ / સ્ત્રી)				
2.13	Education level of the farmer (Year) / ખેડૂતનું શિક્ષણ (વર્ષમાં)				
2.14	Soil type of selected field / પસંદ થયેલ ખેતરની જમીન પ્રત				
2.15	Approximate date and month of sowing or transplanting વાવણી / રોપણીની તારીખ (દા.ત. : ૦૨/૦૫/૨૦૧૬)				

2.16	Method of sowing (Broadcasting/line sowing) **વાવણીની પદ્ધતિ (છંટકાવ / ક્યારાંમા)**				
2.17	Seed sown (kg in the area sown under the crop) **બીજની રોપણી (કિગ્રા)**				
2.18	Whether local or improved or high yielding variety? / **દેશી /સુધારેલ કે હાઇબ્રિડ જાત?**				
2.19	Whether irrigated or un-irrigated? / **પિયત કે બિન પિયત?**				
2.20	If irrigated, write the source of irrigation (canal/tank/well/other(specify) **સિંચાઇનો સ્ત્રોત (નહેર,તળાવ,કુવો અન્ય-સ્પષ્ટતાં કરવી)**				
2.21	Whether the crop is affected by abnormal seasonal conditions? (excess rain/flood, drought, frost, hail storm, other-specify) / **પાકને ઋતુગત અસાધારણ સ્થિતિમાં નુકશાન થયેલ છે? (અતિ વરસાદ/ પુર / દુકાળ / હિમ કરા કે અન્ય) સ્પષ્ટતાં કરવી**				
2.22	Whether the crop is affected by insects? Yes/No **જીવજંતુઓથી પાકને નુકશાન થયેલ? હા / ના**				
2.23	If yes, whether control measure applied? Yes/No **જીવજંતુના નિયંત્રણનો ઉપચાર કરેલ? હા / ના**				
2.24	Whether the crop is affected by diseases? Yes/No **રોગથી પાકને નુકશાન થયેલ? હા / ના**				
2.25	If yes, whether control measure applied? Yes/No **રોગ નિયંત્રણનો ઉપયોગ કરેલ? હા / ના**				
2.26	Whether the crop is affected by weeds? Yes/No **પાક નિંદામણની અસર થયેલ? હા / ના**				
2.27	If yes, whether control measure applied? Yes/No **નિંદામણ નિયંત્રણનો ઉપયોગ / અમલમાં મુકેલ? હા / ના**				
2.28	Whether chemical fertilizer applied? Yes/No **પાકમાં રાસાણિક ખાતરનો ઉપયોગ કરેલ? હા / ના**				
2.29	Whether green/farmyard manure applied? Yes/No **પાકમાં લીલો પડવાસ કે છાણિયાં ખાતરનો ઉપયોગ કરેલ? હા / ના**				
2.30	Farmer eye estimate of the yield in quintal per ha of the experimental crop **ખેડૂતની દ્રષ્ટિએ પાકની પ્રતિ હેકટરે ખેત ઉત્પાદકતા જણાવો**				
2.31	Date fixed for harvesting **કાપણીની તારીખ**				

3.0 Selection of experimental plots / પસંદ થયેલ પ્રયોગાત્મક પ્લોટની વિગત
ગામમાનાં મુખ્ય ધાન્ય અને કઠોડ પાક કૈંસમા દશાચેલ માથી લેવાના રહેશે - (ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, તુવેર, મગ, અડદ, મગફળી, તલ)

S.l. ક્રમ	Items વિગત	Experiment પ્રયોગ / અખતરો			
		Crop 1/ પાક ૧ નું નામ		Crop 2/ પાક ૨ નું નામ	
		Plot I પ્લોટ ૧	Plot II પ્લોટ ૨	Plot I પ્લોટ ૧	Plot II પ્લોટ ૨
3.1	Length of the selected field in steps from the S.W. corner દ.પ. ના ખૂણેથી પસંદ થયેલ ખેતરની લંબાઇ (પગલામાં)				
3.2	Breadth of the field selected in steps from the S.W. corner દ.પ. ના ખૂણેથી પસંદ થયેલ ખેતરની પહોળાઇ (પગલામાં)				
3.3	Length minus steps as per in length of experimental plot ખેતરની કુલ લંબાઇ અને ખેડાણ હેઠળની લંબાઇ વચ્ચે અંતર				
3.4	Breadth minus steps as per in breadth of experimental plot ખેતરની કુલ પહોળાઇ અને ખેડાણ હેઠળની પહોળાઇ વચ્ચે અંતર				
3.5	Random numbers selected (Random step) for location of SW Corner of experimental plot દ.પ. ના ખૂણેથી ખેડાણ હેઠળના પ્લોટના યદ્ચ્છ સંખ્યા	L B	L B	L B	L B

L (Length) - લંબાઇ, B (Breadth) - પહોળાઇ

Name, designation and signature of the Primary Worker with date /
પ્રાથમિક માહિતી મેળવવાની નામ અને સહી તારીખ

ફોન અને ઇમેલ

Remarks of the Inspecting Officer, /
તપાસનારની નોંધ
(With particular reference to the quality of the crop whether affected by adverse seasonal conditions etc.)

Name, designation and signature of the Inspecting Officer with date /
ટપાસનારનું નામ અને સહી

તારીખ

ફોન
ઇમેલ

CCE Schedule–II: Details of produce (wet and dry) obtained from CCE plots
સીસીઇ પ્રશ્નાવલી - ૨ : CCE <u>ખરીફ</u> પ્લોટમાં મેળવેલ ઉત્પાદન (સૂકું અને લીલું)ની માહિતી
(ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, તુવેર, મગ, અડદ, મગફળી, તલ)

Note : Please respond to every item, if any information is not available, write 'not available'. Tick appropriate items where choices are provided.
નોંધ - દરેક માહિતી મેળવવાની રહેશે, જે માહિતી ન મળે તે જગ્યાએ " માહિતી નથી" તેમ દર્શાવવું. એકથી વધુ વિકલ્પો હોય ત્યારે યોગ્ય વિકલ્પની પસંદગી કરવી.

1.0 Particulars of the village / ગામની માહિતી

S.l. ક્રમ	Items / વિગત	Information / માહિતી
1.1	Agril. Year / કૃષિ વર્ષ	
1.2	Agril. Season / કૃષિ ઋતુ	
1.3	District / જીલ્લો	
1.4	Taluk/tehsil/circle / તાલુકો / એકમ	
1.5	Block / બ્લોક	
1.6	Village / ગામ	
1.7	Name of crop / પાકનું નામ	
1.8	Date of visit to the village / ગામની મુલાકાત તારીખ	

2.0 Particulars of selection of experimental plots /
પસંદ થયેલ પ્રાયોગિક **ખરીફ** પાકના ખેતર/પ્લોટની માહિતી
ગામમાં મુખ્ય ધાન્ય અને કઠોડ પાક કૈસમા દર્શાયેલ માથી લેવાના રહેશે - (ડાંગર, બાજરી, મકાઇ, જુવાર, રાગી, તુવેર, મગ, અડદ, મગફળી, તલ)

S.l. ક્રમ	Items / વિગત	Experiment / પ્રયોગ / અખતરો			
		Crop 1/ પાક ૧ નું નામ		Crop 2/ પાક ૨ નું નામ	
		Plot I પ્લોટ ૧	Plot II પ્લોટ ૨	Plot I પ્લોટ ૧	Plot II પ્લોટ ૨
2.1	Survey field number finally selected for experiment ખેતરનો સર્વે નંબર જે અંતિમ તબક્કાએ પસંદ કરેલ હોય તે દર્શાવો				
2.2	Area of finally selected field અંતિમ પસંદ થયેલ ખેતરનો વિસ્તાર (હે)				
2.3	Name of the farmer of the selected field and his father's name પસંદ થયેલ ખેતરના માલિકનું (ખેડૂત) પુરૂં નામ				
2.4	Date and month of sowing or transplanting રોપણી / વાવણીની તારીખ (દા.ત. : ૦૨/૦૫/૨૦૧૬)				
2.5	Method of sowing (Broadcasting, line sowing etc.) રોપણી / વાવણીની પધ્ધતિ (છંટકાવ / લીટીમાં રોપણી / વાવણી)				
2.6	Seed sown (kgs in the area sown under the crop) પસંદ કરેલ ખેતર અને પાકનાં બિયારણનો જથ્થો (કિગ્રા)				
2.7	Whether local or improved or high yielding variety? Yes/No દેશી / સુધરેલ / હાઇબ્રીડ જાતિ? હા / ના				

3.0 Information of inputs applied to the experimental crop after filling Schedule-1
પ્રશ્નાવલી ભર્યા પછી પ્રયોગ હેઠળ પાક અને ખેતરમાં વપરાયેલ ખેત-સામગ્રી (નિક્ષેપો) ની માહિતી

S.l. કમ	Items / વિગત	Experiment / પ્રયોગ / અખતરો			
		Crop 1/ પાક ૧ નું નામ		Crop 2/ પાક ૨ નું નામ	
		Plot I પ્લોટ ૧	Plot II પ્લોટ ૨	Plot I પ્લોટ ૧	Plot II પ્લોટ ૨
3.1	Whether irrigated or un-irrigated? (Yes/No) પિયત અથવા બિનપિયત છે? હા / ના				
3.2	If yes, whether irrigation applied or not જો હા, પિયત કરેલ છે કે નથી કરેલ				
3.3	If applied, write the source of irrigation (canal/ tank/ well/ other-specify) જો સિંચાઇ કરેલ હોય તો પાણીનો સ્રોત (નહેર, તળાવ, કુવા કે અન્ય)				
3.4	Whether the crop is affected by abnormal seasonal conditions (excess rain/flood, drought, frost, hail storm, other-specify) અસામાન્ય ઋતુગત પરિસ્થિતિને કારણે પાકને થયેલ અસર (વધુ વરસાદ, ઓછો વરસાદ, સુકારો, અતિવૃષ્ટિ,, કરા, કરા સાથે તેજ પવન કે અન્ય) જણાવો				
3.5	Whether the crop is affected by insects? Yes/No કિટક જીવજંતુથી પાકને અસર થયેલ? હા / ના				
3.6	If yes, whether control measure applied? Yes/No જો હા, નિયંત્રણ માટેના પગલાંઓ લીધેલ હતા? હા / ના				
3.7	Whether the crop is affected by diseases? Yes/No રોગોને કારણે પાકને અસર થયેલ? હા / ના				
3.8	If yes, whether control measure applied? Yes/No જો હા, નિયંત્રણ માટેના પગલાંઓ લીધેલ હતા? હા / ના				
3.9	Whether the crop is affected by weeds? Yes/No પાકને નિંદામણથી અસર થયેલ? હા / ના				
3.10	If yes, whether control measure applied? Yes/No જો હા, નિંદામણ માટેના પગલાંઓ લીધા હતા? હા / ના				
3.11	Whether chemical fertilizer applied? Yes/No રાસાણિક ખાતરનો ઉપયોગ કરેલ? હા / ના				
3.12	Farmer eye estimate of the yield quintal per ha of the experimental crop ખેડૂતની દ્રષ્ટિએ પ્રયોગ હેઠળ પાકની ઉત્પાદકતા કેટલી છે?				

4.0 Results of Harvesting and Threshing / કાપણી અને લણણીનાં પરિણામો
(L (Length) - લંબાઇ, B (Breadth) - પહોળાઇ)

S.1 ક્રમ	Items / વિગત	Experiment / પ્રયોગ / અખતરો			
		Crop 1/ પાક ૧ નું નામ		Crop 2/ પાક ૨ નું નામ	
		Plot I પ્લોટ ૧	Plot II પ્લોટ ૨	Plot I પ્લોટ ૧	Plot II પ્લોટ ૨
4.1	Shape and area (square meter) of experimental plot પ્રયોગ હેઠળના પ્લોટ / ખેતરનો વિસ્તાર (મીટર²)				
4.2	Random number used for making the experimental plot પ્રાયોગિક પ્લોટ માટે ઉપયોગ કરેલ પદચ્છ સંખ્યા				
4.3	Date fixed for harvesting as per CCE schedule-I CCE પ્રશ્નાવલી ૧ પ્રમાણે કાપણી / લણણીની તારીખ				
4.4	State of crop maturity on the day of harvesting (under ripen, normal, over ripen) / કાપણીના દિવસે પાકની પરિપકવતાં / ગુણવત્તા વિશે કહો (અર્ધકાચા, સામાન્ય, પાકટ)				
4.5	Did the farmer harvest any part of the field prior to the harvest of the plot (Yes or No) પસંદ થયેલ ખેતર / પ્લોટ માંથી કોઇ વિસ્તાર / હિસ્સો કાપણી પહેલા ખેડૂતે તેની કાપણી કરેલ હતી (હા / ના)				
4.6	If he did, was the position of the experimental plot affected? જો કરેલ હોય તો, તે પ્રયોગ હેઠળ પ્લોટ પર થયેલ અસર જણાવો.				
4.7	If yes, write new pair of random number for making the experimental plot જો હા, તો યદચ્છ સંખ્યાની નવી જોડી આ ખેતર - પ્લોટ માટે બનાવો.				
4.8	Actual date of harvesting કાપણી / લણણીની ખરેખર તારીખ (દા.ત. ૦૨/૦૫/૨૦૧૬)				
4.9	*Weight of grains/produce soon after harvest on the date of harvesting / પાકની કાપણી કર્યા પછી દાણા / ઉત્પાદનનું વજન જણાવો				
4.10	Weight of number of bundles of harvested plants (Paddy, Wheat, Barley, Gram, Oilseeds) if not threshed on the day of harvesting due to excess moisture in harvested plants જો કાપણીના દિવસે પાકમાં વધુ ભેજ હોવાથી દાંણા છુટા પાડ્યાં ન હોય અને કાપણી કરેલ પાકનાં પુરાંનાં સંખ્યાનું વજન (ડાંગર, ધંઉ, જવ, ચણા, તેલીબીયાં)				
4.11	Date of threshing કાપણી / લણણીની તારીખ				
4.12	Date of weighment of dry grains/pods soon after threshing કાપણી કર્યા પછી દાંણા છુટા પાડ્યાંની તારીખ				
4.13	**Weight of grains/produce if threshed soon after drying the harvested plants/cobs/bundles કાપણી પછી પાકને સુકવીને કરેલ થ્રેસરીંગ (દાંણા છુટા પાડવા) પછી પાકના દાંણા / ઉત્પાદનનું વજન જણાવો				
4.14	Whether drying/rotting or both is required? પાકને સુકવવાની / ફેરવવાની કે બંનેની જરૂર છે? હા / ના				
4.15	If yes, whether this village is selected for driage experiment? જો હા, પસંદ કરેલ ગામ શુષ્ક પ્રાયોગિક માટે પસંદ કરેલ છે?				

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4.16	If yes, quantity of produce drawn and kept for drying જો હા, પાકનો મેળવેલ જથ્થો અને સૂકવેલ જથ્થો દર્શાવો				
4.17	Date of completion of driage/curing/rotting and both સૂકવેલ પાકની તારીખ / પાક સૂકવવાની તારીખ દર્શાવો				
4.18	Date of weighment of dry produce સૂકા ઉત્પાદનની તોલમાપ તારીખ દર્શાવો				
4.19	Dry weight of the produce સૂકા ઉત્પાદનનું વજન દર્શાવો				
4.20	Weight of the Kernal obtained from one Kg of dried pods of groundnut or other similar crops / એક કિગ્રા મગફળી કે તેના જેવા પાકનાં સૂકા શીંગોમાંથી મેળવેલ દાણા / માવા નું વજન દર્શાવો				
4.21	Percentage reduction in weight due to drying સૂકવવાને કારણે દાણા / માવાનાં વજનમાં થયેલ ઘટાડાની ટકાવારી દર્શાવો				

Note નોંધ :

 * Form of produce to be recorded soon after harvest on the date of harvesting / પાકની કાપણી નક્કી કરેલ તારીખે કાપણી કરે ત્યાર પછી ઉત્પાદન નોંધવાનું.
   • Paddy, Wheat, Barley, Gram, Oilseeds: Weight of undried grain, if threshed. / જો પાક સુકવ્યા વગર થ્રેસીંગ કરેલ હોય તેવા પાકનાં ઉત્પાદનનું વજન જેવા કે ડાંગર, ઘંઉ, જવ, ચણા, તેલીબીયા.
   • Jowar, Bajra, Maize, Ragi: Number and weight of undried cobs / લીલાં ડુંડાની સંખ્યા અને વજન / જેવા કે જુવાર, બાજરી, મકાઇ, રાગી.
   • Red gram and Sesamum: Number of bundles / ચણા અને તલની ભારી / પુરાંની સંખ્યા
   • Groundnut: Weight of undried cleaned pods / મગફળીની શીંગોનું વજન
** Form of produce to be recorded after threshing/drying of harvested plants/cobs/pods (After threshing the seed should be exposed to the sun for a few hours) / કાપણી / લણણી કર્યા પછી નોંધાયેલ ઉત્પાદનની વિગતનું
   • Weight of dried seed of Redgram/Sesamum after threshing: In case of Sesamum or similar crop where seeds may not come out at the 1st threshing, the weight should be recorded at every time soon after threshing and the total dried weight of Sesamum seed has to be noted. / થ્રેસીંગ પછી સૂકવેલ પાકનાં બીજનું વજન, તલ કે તેના જેવા પાકોનું પ્રથમ વખત થ્રેસીંગમાં ઉત્પાદન ન મળેલ હોય તેવા દરેક થ્રેસીંગ પ્રમાણે ઉત્પાદન જોઈ. / કુલ તલનું ઉત્પાદન થયેલ બીજનું વજન દર્શાવવું.
   • Weight of the dried grains of wheat, paddy, barley, gram, oilseeds. / ઘંઉ, ડાંગર, જવ, ચણા, તેલીબીયાં વગેરે ના સુકા અનાજ કે દાણાનું વજન
   • Jowar, Bajra, Ragi and Maize (cobs/grains). / જુવાર, બાજરા, રાગી અને મકાઇ (શીંગો / અનાજ)
   • Groundnut (dried pods) / મગફળીની સુકી શીંગો

Name, designation and signature of the Primary Worker with date

તારીખ

ફોન અને ઇમેલ

Remarks of the Inspecting Officer, / તપાસનારની નોંધ
(With particular reference to the quality of the crop whether affected by adverse seasonal conditions etc.)

Name, designation and signature of the Inspecting Officer with date /

ટપાસનારનું નામ અને સહી
તારીખ
ફોન અને ઇમેલ

Pilot study for developing state level estimates of crop area and production on the basis of sample size recommended by Professor Vaidyanathan Committee report

CCE Schedule I: Particulars of parcels selected for crop cutting experiments
સીસીઇ પ્રશ્નાવલી - ૧ : પસંદ કરેલ સર્વે નંબરના **રવિ** પાકની કાપણીના અખતરાની વિગત
(ઘઉં, જવ, ચણા, તલ, રાયડો)

Note / નોંધ :

1. Fill up the schedule on the day of selection of survey number at least **one month before** start of crop harvest. /

૧. માહિતી મેળવવાની તારીખથી એક માસ પહેલા પાકની કાપણી / લણણી શરૂ થયેલ હોય તેવા પસંદ થયેલ સર્વે નંબરની માહિતી ભરો.

2. Respond to every item, if any information is not available, write 'not available'. Tick appropriate item where choices are provided. /

૩. દરેક માહિતી મેળવવાની રહેશે, જે માહિતી ન મળે તે જગ્યાએ " માહિતી નથી" તેમ દર્શાવવું. એકથી વધુ વિકલ્પો હોય ત્યારે યોગ્ય વિકલ્પની પસંદગી કરવી.

1.0 Particulars of the village / ગામની વિગત

S.l. ક્રમ	Items / વિગત	Information માહિતી
1.1	Agril. Year / કૃષિ વર્ષ	
1.2	Agril. Season / કૃષિ ઋતુ	
1.3	District / જીલ્લો	
1.4	Taluk/tehsil/circle / તાલુકો	
1.5	CD Block / સીડી બ્લોક	
1.6	Village / ગામ	
1.7	ne of crop / પાકનું નામ	
1.8	Date of visit to the village / ગામની મુલાકાત તારીખ	
1.9	Total survey/dag number or total farmer households (HH) in the village / ગામનાં કુલ ખેડૂત કુટુંબોની સંખ્યા	
1.10	Total number of survey/dags or farmer households selected out of hundred growing the particular crop under this study (from Table C of Schedule 1) / ગામમાં ૧૦૦ ખેડૂતોમાંથી અભ્યાસનો પાક પકવતાં ખેડૂતોની સંખ્યા	

2.0 Selection of Fields for Kharif Crop / રવિ અખતરા પાક માટે ખેતરની પસંદગી

ગામમાનાં મુખ્ય ધાન્ય અને કઠોડ પાક કૈંસમા દશાયેલ માથી લેવાના રહેશે - (ઘઉં, જવ, ચણા, તલ, રાયડો)

S.l. કમ	Items વિગત	Experiment પ્રયોગ / અખતરો	
		Crop 1/ પાક ૧ નું નામ	
		Plot I પ્લોટ ૧	Plot II પ્લોટ ૨
1	2	3	4
2.1	Random number selected for selection of survey no. for CCE ચાદચ્છિક રીતે પસંદ થયેલ કમ નંબર દર્શાવો		
2.2	Number of survey no. corresponding to selected random number / પસંદ થયેપ સર્વે નંબર દર્શાવો		
2.3	Reason for rejection of the survey numbers, if any / સર્વે નંબર ન પસંદ કરવાનું કારણો (છોડી દેવાં)		
2.4	If rejected, new random number for selection of survey no. for CCE / નવા સર્વે નંબરની ચાદચ્છિક પસંદગી નંબર		
2.5	Number of survey no. corresponding to newly selected random number / નવો પસંદ થયેપ સર્વે નંબર દર્શાવો		
2.6	Survey number finally selected / અંતિમ તબક્કે પસંદ કરેલ સર્વે નંબર લખો		
2.7	Number of fields in the selected survey/dag number પસંદ થયેલ સર્વેનાં ફિલ્ડ/ પ્લોટ (ખેતરો) ની સંખ્યા.		
2.8	Field number nearest to South West Corner of the selected Survey/dag Number / દક્ષિણ -પશ્ચિમ ખૂણાંનો પસંદ થયેલ ખેતર/ પ્લોટનો વિસ્તાર દશાર્વો		
2.9	Area of finally selected field nearest to South West Corner of the selected Survey/dag Number (ha) / અંતિમ તબક્કે પસંદ થયેલ દક્ષિણ -પશ્ચિમ ખૂણાંના પ્લોટનો વિસ્તાર (હે.)		
2.10	Name of the farmer of the selected field and his father's name / પસંદ થયેલ ખેતરનાં ખેડૂત નું નામ		
2.11	Age of the farmer (Year) ખેડૂતની ઉમંર (વર્ષમાં)		
2.12	Sex of the farmer (Male/Female) ખેડૂતની જાતિ (પુરુષ / સ્ત્રી)		
2.13	Education level of the farmer (Year) ખેડૂતનું શિક્ષણ (વર્ષમાં)		
2.14	Soil type of selected field પસંદ થયેલ ખેતરની જમીન પ્રત		
2.15	Approximate date and month of sowing or transplanting વાવણી / રોપણીની તારીખ (દા.ત. : ૦૨/૦૫/૨૦૧૬)		
2.16	Method of sowing (Broadcasting/line sowing) વાવણીની પદ્ધતિ (છંટકાવ / ક્યારાંમા)		

2.17	Seed sown (kg in the area sown under the crop) બીજની રોપણી (કિગ્રા)		
2.18	Whether local or improved or high yielding variety? / દેશી /સુધારેલ કે હાઇબ્રિડ જાત?		
2.19	Whether irrigated or un-irrigated? / પિયત કે બિન પિયત?		
2.20	If irrigated, write the source of irrigation (canal/tank/well/other(specify) સિંચાઇનો સ્ત્રોત (નહેર,તળાવ,કુવો અન્ય-સ્પષ્ટતાં કરવી)		
2.21	Whether the crop is affected by abnormal seasonal conditions? (excess rain/flood, drought, frost, hail storm, other-specify) / પાકને ઋતુગત અસાધારણ સ્થિતિમાં નુકશાન થયેલ છે? (અતિ વરસાદ/ પુર / દુકાળ / હિમ કરા કે અન્ય) સ્પષ્ટતાં કરવી		
2.22	Whether the crop is affected by insects? Yes/No જીવજંતુઓથી પાકને નુકશાન થયેલ? હા / ના		
2.23	If yes, whether control measure applied? Yes/No જીવજંતુના નિયંત્રણનો ઉપચાર કરેલ? હા / ના		
2.24	Whether the crop is affected by diseases? Yes/No રોગથી પાકને નુકશાન થયેલ? હા / ના		
2.25	If yes, whether control measure applied? Yes/No રોગ નિયંત્રણોનો ઉપયોગ કરેલ? હા / ના		
2.26	Whether the crop is affected by weeds? Yes/No પાક નિંદામણની અસર થયેલ? હા / ના		
2.27	If yes, whether control measure applied? Yes/No નિંદામણ નિયંત્રણનો ઉપયોગ / અમલમાં મુકેલ? હા / ના		
2.28	Whether chemical fertilizer applied? Yes/No પાકમાં રાસાણિક ખાતરનો ઉપયોગ કરેલ? હા / ના		
2.29	Whether green/farmyard manure applied? Yes/No પાકમાં લીલો પડવાસ કે છાણિયાં ખાતરનો ઉપયોગ કરેલ? હા / ના		
2.30	Farmer eye estimate of the yield in quintal per ha of the experimental crop ખેડૂતની દ્રષ્ટિએ પાકની પ્રતિ હેક્ટરે ખેત ઉત્પાદકતા જણાવો		
2.31	Date fixed for harvesting કાપણીની તારીખ		

3 .0 Selection of experimental plots / પસંદ થયેલ પ્રયોગાત્મક પ્લોટની વિગત
ગામમાનાં મુખ્ય ધાન્ય અને કઠોડ પાક કૈસમા દશરિચેલ માથી લેવાના રહેશે - (ઘઉં, જવ, ચણા, તલ, રાયડો)

S.l. કમ	Items વિગત	Experiment પ્રયોગ / અખતરો			
		Crop 1/ પાક ૧ નું નામ			
		Plot I પ્લોટ ૧		Plot II પ્લોટ ૨	
3.1	Length of the selected field in steps from the S.W. corner દ.પ. ના ખૂણેથી પસંદ થયેલ ખેતરની લંબાઇ (પગલામાં)				
3.2	Breadth of the field selected in steps from the S.W. corner દ.પ. ના ખૂણેથી પસંદ થયેલ ખેતરની પહોળાઇ (પગલામાં)				
3.3	Length minus steps as per in length of experimental plot ખેતરની કુલ લંબાઇ અને ખેડાણ હેઠળની લંબાઇ વચ્ચે અંતર				
3.4	Breadth minus steps as per in breadth of experimental plot ખેતરની કુલ પહોળાઇ અને ખેડાણ હેઠળની પહોળાઇ વચ્ચે અંતર				
3.5	Random numbers selected (Random step) for location of SW Corner of experimental plot દ.પ. ના ખૂણેથી ખેડાણ હેઠળના પ્લોટના યદ્રચ્છ સંખ્યા	L	B	L	B

L (Length) - લંબાઇ, B (Breadth) - પહોળાઇ

Name, designation and signature of the Primary Worker with date /
પ્રાથમિક માહિતી મેળવવાની નામ અને સહી

તારીખ

ફોન અને ઇમેલ

Remarks of the Inspecting Officer, /
તપાસનારની નોંધ
(With particular reference to the quality of the crop whether affected by adverse seasonal conditions etc.)

Name, designation and signature of the Inspecting Officer with date /
ટપાસનારનું નામ અને સહી

તારીખ

ફોન અને ઇમેલ

Pilot study for developing state level estimates of crop area and production on the basis of sample size recommended by Professor Vaidyanathan Committee report (Funded by DoAC, MoA, GoI)

CCE Schedule–II: Details of produce (wet and dry) obtained from CCE plots
સીસીઇ પ્રશ્નાવલી - ૨ : CCE રવિ પ્લોટમાં મેળવેલ ઉત્પાદન (સૂકું અને લીલું)ની માહિતી
(ઘઉં, જવ, ચણા, તલ, રાયડો)

Note : Please respond to every item, if any information is not available, write 'not available'. Tick appropriate items where choices are provided.
નોંધ - દરેક માહિતી મેળવવાની રહેશે, જે માહિતી ન મળે તે જગ્યાએ " માહિતી નથી" તેમ દર્શાવવું. એકથી વધુ વિકલ્પો હોય ત્યારે યોગ્ય વિકલ્પની પસંદગી કરવી.

5.0 Particulars of the village / ગામની માહિતી

S.l. ક્રમ	Items / વિગત	Information / માહિતી
1.1	Agril. Year / કૃષિ વર્ષ	
1.2	Agril. Season / કૃષિ ઋતુ	
1.3	District / જીલ્લો	
1.4	Taluk/tehsil/circle / તાલુકો / એકમ	
1.5	Block / બ્લોક	
1.6	Village / ગામ	
1.7	Name of crop / પાકનું નામ	
1.8	Date of visit to the village / ગામની મુલાકાત તારીખ	

6.0 Particulars of selection of experimental plots /
પસંદ થયેલ પ્રાયોગિક રવિ પાકના ખેતર/પ્લોટની માહિતી
ગામમાનાં મુખ્ય ધાન્ય અને કઠોર પાક કૈંસમા દર્શાવેલ માથી લેવાના રહેશે - (ઘઉં, જવ, ચણા, રાયડો)

S.l. ક્રમ	Items / વિગત	Experiment / પ્રયોગ / અખતરો	
		Crop 1/ પાક ૧ નું નામ	
		Plot I પ્લોટ ૧	Plot II પ્લોટ ૨
2.1	Survey field number finally selected for experiment ખેતરનો સર્વે નંબર જે અંતિમ તબક્કાએ પસંદ કરેલ હોય તે દર્શાવો		
2.2	Area of finally selected field અંતિમ પસંદ થયેલ ખેતરનો વિસ્તાર (હે)		
2.3	Name of the farmer of the selected field and his father's name પસંદ થયેલ ખેતરના માલિકનું (ખેડૂત) પુરું નામ		
2.4	Date and month of sowing or transplanting રોપણી / વાવણીની તારીખ (દા.ત. : ૦૨/૦૫/૨૦૧૬)		
2.5	Method of sowing (Broadcasting, line sowing etc.) રોપણી / વાવણીની પદ્ધતિ (છંટકાવ / લીટીમાં રોપણી / વાવણી)		
2.6	Seed sown (kgs in the area sown under the crop) પસંદ કરેલ ખેતર અને પાકનાં બિયારણનો જથ્થો (કિગ્રા)		
2.7	Whether local or improved or high yielding variety? Yes/No દેશી / સુધરેલ / હાઇબ્રીડ જાતિ? હા / ના		

Information of inputs applied to the experimental crop after filling Schedule-1
પ્રશ્નાવલી ભર્યા પછી પ્રયોગ હેઠળ પાક અને ખેતરમાં વપરાયેલ ખેત-સામગ્રી (નિક્ષેપો) ની માહિતી

S.l. ક્રમ	Items / વિગત	Experiment / પ્રયોગ / અખતરા	
		Crop 1/ પાક ૧ નું નામ	
		Plot I પ્લોટ ૧	Plot II પ્લોટ ૨
3.1	Whether irrigated or un-irrigated? (Yes/No) પિયત અથવા બિનપિયત છે? હા / ના		
3.2	If yes, whether irrigation applied or not જો હા, પિયત કરેલ છે કે નથી કરેલ		
3.3	If applied, write the source of irrigation (canal/ tank/ well/ other-specify) જો સિંચાઈ કરેલ હોય તો પાણીનો સ્ત્રોત (નહેર, તળાવ, કુવા કે અન્ય)		
3.4	Whether the crop is affected by abnormal seasonal conditions (excess rain/flood, drought, frost, hail storm, other-specify) અસામાન્ય ઋતુગત પરિસ્થિતિને કારણે પાકને થયેલ અસર (વધુ વરસાદ, ઓછો વરસાદ, સુકારો, અતિવૃષ્ટિ,, કરા, કરા સાથે તેજ પવન કે અન્ય) જણાવો		
3.5	Whether the crop is affected by insects? Yes/No કિટક જીવજંતુથી પાકને અસર થયેલ? હા / ના		
3.6	If yes, whether control measure applied? Yes/No જો હા, નિયંત્રણ માટેના પગલાંઓ લીધેલ હતા? હા / ના		
3.7	Whether the crop is affected by diseases? Yes/No રોગોને કારણે પાકને અસર થયેલ? હા / ના		
3.8	If yes, whether control measure applied? Yes/No જો હા, નિયંત્રણ માટેના પગલાંઓ લીધેલ હતા? હા / ના		
3.9	Whether the crop is affected by weeds? Yes/No પાકને નિંદામણથી અસર થયેલ? હા / ના		
3.10	If yes, whether control measure applied? Yes/No જો હા, નિંદામણ માટેના પગલાંઓ લીધા હતા? હા / ના		
3.11	Whether chemical fertilizer applied? Yes/No રાસાણિક ખાતરનો ઉપયોગ કરેલ? હા / ના		
3.12	Farmer eye estimate of the yield quintal per ha of the experimental crop ખેડૂતની દ્રષ્ટિએ પ્રયોગ હેઠળ પાકની ઉત્પાદકતા કેટલી છે?		

7.0 Results of Harvesting and Threshing / કાપણી અને લણણીનાં પરિણામો
(L (Length) - **લંબાઇ**, B (Breadth) - **પહોળાઇ**)

S.l કમ	Items / વિગત	Experiment / પ્રયોગ / અખતરો	
		Plot I પ્લોટ ૧	Plot II પ્લોટ ૨
4.1	Shape and area (square meter) of experimental plot પ્રયોગ હેઠળના પ્લોટ / ખેતરનો વિસ્તાર (મીટર²)		
4.2	Random number used for making the experimental plot પ્રાયોગિક પ્લોટ માટે ઉપયોગ કરેલ પદ્ચ્છ સંખ્યા	L B	L B
4.3	Date fixed for harvesting as per CCE schedule-I CCE પ્રશ્નાવલી ૧ પ્રમાણે કાપણી / લણણીની તારીખ		
4.4	State of crop maturity on the day of harvesting (under ripen, normal, over ripen) / કાપણીના દિવસે પાકની પરિપક્વતાં / ગુણવત્તા વિશે કહો (અર્ધકાચા, સામાન્ય, પાકટ)		
4.5	Did the farmer harvest any part of the field prior to the harvest of the plot (Yes or No) પસંદ થયેલ ખેતર / પ્લોટ માંથી કોઇ વિસ્તાર / હિસ્સો કાપણી પહેલા ખેડૂતે તેની કાપણી કરેલ હતી (હા / ના)		
4.6	If he did, was the position of the experimental plot affected? જો કરેલ હોય તો, તે પ્રયોગ હેઠળ પ્લોટ પર થયેલ અસર જણાવો.		
4.7	If yes, write new pair of random number for making the experimental plot જો હા, તો યદ્ચ્છ સંખ્યાની નવી જોડી આ ખેતર - પ્લોટ માટે બનાવો.		
4.8	Actual date of harvesting કાપણી / લણણીની ખરેખર તારીખ (દા.ત. ૦૨/૦૫/૨૦૧૬)		
4.9	*Weight of grains/produce soon after harvest on the date of harvesting / પાકની કાપણી કર્યા પછી દાણા / ઉત્પાદનનું વજન જણાવો		
4.10	Weight of number of bundles of harvested plants (Paddy, Wheat, Barley, Gram, Oilseeds) if not threshed on the day of harvesting due to excess moisture in harvested plants જો કાપણીના દિવસે પાકમાં વધુ ભેજ હોવાથી દાંણા છુટા પાડયાં ન હોય અને કાપણી કરેલ પાકનાં પુરાંનાં સંખ્યાનું વજન (ડાંગર, ધંઉ, જવ, ચણા, તેલીબીયાં)		
4.11	Date of threshing કાપણી / લણણીની તારીખ		
4.12	Date of weighment of dry grains/pods soon after threshing કાપણી કર્યા પછી દાંણા છુટા પાડયાંની તારીખ		
4.13	**Weight of grains/produce if threshed soon after drying the harvested plants/cobs/bundles કાપણી પછી પાકને સુકવીને કરેલ થ્રેસરીંગ (દાંણા છુટા પાડવા) પછી પાકના દાંણા / ઉત્પાદનનું વજન જણાવો		
4.14	Whether drying/rotting or both is required? પાકને સુકવવાની / ફેરવવાની કે બંનેની જરૂર છે? હા / ના		
4.15	If yes, whether this village is selected for driage experiment? જો હા, પસંદ કરેલ ગામ શુષ્ક પ્રાયોગિક માટે પસંદ કરેલ છે?		
4.16	If yes, quantity of produce drawn and kept for drying જો હા, પાકનો મેળવેલ જથ્થો અને સૂકવેલ જથ્થો દર્શાવો		
4.17	Date of completion of driage/curing/rotting and both સુકવેલ પાકની તારીખ / પાક સુકવવાની તારીખ દર્શાવો		

4.18	Date of weighment of dry produce સૂકા ઉત્પાદનની તોલમાપ તારીખ દર્શાવો		
4.19	Dry weight of the produce સૂકા ઉત્પાદનનું વજન દર્શાવો		
4.20	Weight of the Kernal obtained from one Kg of dried pods of groundnut or other similar crops / એક કિગ્રા મગફળી કે તેના જેવા પાકનાં સૂકા શીંગોમાંથી મેળવેલ દાણા / માવા નું વજન દર્શાવો		
4.21	Percentage reduction in weight due to drying સૂકવવાને કારણે દાણા / માવાનાં વજનમાં થયેલ ઘટાડાની ટકાવારી દર્શાવો		

Note નોંધ :

* Form of produce to be recorded soon after harvest on the date of harvesting / પાકની કાપણી નક્કી કરેલ તારીખે કાપણી કરે ત્યાર પછી ઉત્પાદન નોંધવાનું.

- Wheat, Gram, Oilseeds: Weight of undried grain, if threshed. /
જો પાક સુકવ્યા વગર થ્રેસીંગ કરેલ હોય તેવા પાકનાં ઉત્પાદનનું વજન જેવા કે ઘંઉ, ચણા, તેલીબીયા.
- Red gram and Sesamum: Number of bundles / ચણા અને તલની ભારી / પુરાંની સંખ્યા

** Form of produce to be recorded after threshing/drying of harvested plants/cobs/pods (After threshing the seed should be exposed to the sun for a few hours) / કાપણી / લણણી કર્યા પછી નોંધાયેલ ઉત્પાદનની વિગતનું

- Weight of dried seed of Redgram/Sesamum after threshing: In case of Sesamum or similar crop where seeds may not come out at the 1st threshing, the weight should be recorded at every time soon after threshing and the total dried weight of Sesamum seed has to be noted. / થ્રેસીંગ પછી સૂકવેલ પાકનાં બીજનું વજન, તલ કે તેના જેવા પાકોનું પ્રથમ વખત થ્રેસીંગમાં ઉત્પાદન ન મળેલ હોય તેવા દરેક થ્રેસીંગ પ્રમાણે ઉત્પાદન જોવું. / કુલ તલનું ઉત્પાદન થયેલ બીજનું વજન દર્શાવવું.
- Weight of the dried grains of wheat, gram, oilseeds. / ઘંઉ, ચણા, તેલીબીયાં વગેરે ના સુકા અનાજ કે દાણાનું વજન

Name, designation and signature of the Primary Worker with date

પ્રાથમિક માહિતી મેળવવાની નામ અને સહી

તારીખ

ફોન અને ઇમેલ

Remarks of the Inspecting Officer, / **તપાસનારની નોંધ**
(With particular reference to the quality of the crop whether affected by adverse seasonal conditions etc.)

Name, designation and signature of the Inspecting Officer with date /
ટપાસનારનું નામ અને સહી

તારીખ

ફોન
ઇમેલ

I.C.A.R. - INDIAN AGRICULTURAL STATISTICS RESEARCH INSTITUTE
Library Avenue, New Delhi-110012

Pilot study for developing state level estimates of crop area and production on the basis of sample size recommended by Professor Vaidyanathan Committee report
(Funded by DoAC, MoA, GoI)

INSTRUCTION MANUAL FOR FILLING THE SCHEDULES

Enumeration Schedule-1: Enumeration of 100 household/survey number in the selected village

As per sampling plan suggested in Vaidyanathan Committee report, 100 survey numbers is to be selected randomly in selected village for area enumeration. Survey numbers are to be selected in cluster of five survey numbers. First we have to make the list all the clusters of survey numbers in the village and then we have to select any 20 clusters randomly.

Enumeration schedule-1: Enumeration of 100 household/survey number in the selected village

A) **Identification particulars:** are self explanatory.

B) **General information about the selected village:** are self explanatory. The information at serial number 1 to 12 shall be collected from the land revenue record and knowledgeable person of the selected village preferably from the gram pradhan / village headman.

C) **Enumeration of parcels/farmers households:**

The information on 100 survey number or 100 farmer households shall be collected and recorded in table-C.

Column number-1: This is the serial number 1 to 100 of selected survey number or farmer household.

Column number-2: Write number (identification) of the selected survey number.

Column number-3: Write total area of selected survey number in hectare.

Column number-4 and 5: Write the name and telephone/mobile number of the farmer of the selected survey number along with his father's name in column number 4 and 5 respectively.

The crop grown in the current season in the selected survey number shall be written by the inquiry from the farmer of selected survey number. The farmer may grow more than one crop as

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per his need dividing the selected survey number in separate pieces (field). In this table provision has made to write the five crops. If crops are more, more columns may be added. In case of mixed cropping, the name of all the crops in mixture shall be written altogether. Same crop may be sown in different piece (field) as per date of sowing and variety of crop. In this case, field wise data may be recorded for same crop. Information of each crop shall be written in four columns under separate heads such as serial number, field ID, area sown and irrigation status of the crop.

Column number-6, 7, 8 and 9: Write the serial number, field ID, area sown and status of irrigation of a particular crop. Write 1, if irrigation is applied to the crop, if not write 2.

The other crop grown in separate piece (field) of selected survey shall be written in another set of columns i.e. 10 to 13, 14 to 17, 18 to 21, 22 to 25 and so on as described above.

Primary worker should write the name in full and capital letters, put the signature with date after filling the schedule. Supervisor may also do the similar exercise after ensuring the quality and quantity of schedules filled by primary worker.

Crop cutting experiments: Select two fields out of the total number of fields of each major crop for observing the yield using method of crop cutting experiments. The information of field selection and demarcation of crop cutting experiment shall be filled-up in CCE schedule-1, while harvesting of crop cutting experiment, threshing of harvested plants/cobs/pods and finally produce obtained from CCE plot and driage experiment, if done, shall be filled-up in CCE schedule-2.

CCE Schedule–I: Particulars of parcels selected for crop cutting experiments.

1. Fill up the schedule on the day of selection of parcel/survey number at least one month before start of crop harvest.

2. Respond to every item, if any information is not available, write 'not available'. Tick appropriate item where choices are provided.

3. Fill separate schedule for each crop.

1.0 Particulars of the village: are self explanatory.

2.0. Selection of fields:

As mentioned, two field of each major crop is to be selected for CCE, so the information of these two fields of same crop in the selected village shall be recorded in one schedule.

Serial number-2.1: The random number table shall be used as per the digit in the total survey/field under particular crop. Here, we are considering 100 survey numbers for area enumeration and out of that 100 survey numbers we have to select the survey numbers for CCE. The random number table may be one, two or three digit. The column number from where start to select the random number may be allotted by the nodal officer of the selected state. Random number which is less than or equal to total survey/field under particular crop is to be selected for selection of survey no./parcel for CCE. Select two random numbers and write the first selected random number under experiment-1 and second under experiment-2.

Serial number-2.2: The random number should be less than or equal to total survey/field under particular crop. The survey/field under particular crop corresponding to the random number shall be selected for CCE. Write the survey/field identification.

Serial number-2.3: Write the reason valid for rejection of the survey number, if any.

Serial number-2.4: Write the survey number finally selected.

Serial number-2.5: The selected survey number may be divided into fields as per number of crop sown, different sowing time and variety of the same crop. Write the number of field in the selected parcel.

Serial number-2.6: Write the identification of field finally selected.

Serial number 2.7 to 2.29: are self explanatory. These information shall be collected from farmer of selected survey/filed.

3.0 Selection of experimental plots: Procedure of selecting the random number under different sowing conditions is given in technique of CCE. Length and breadth of the selected field or number of rows of the selected field, random number, random step/row may be determined as per case be i.e.

3.1 Paddy, Jowar, Bajra, Ragi, Maize, Groundnut, Sesamum and other crops when they are not sown in rows

3.2 Redgram, Castor, Sugar-cane, Cotton and other crops when the crop is sown in rows in one direction

3.3 Tobacco and other crops when the crop is sown in rows in both directions

4.0 Information on the proportion of the constituent crops if sown as mixed in the selected fields: In case of crop mixture either sown in rows or broadcasting in the selected field, the proportion of constituent crop may be determined on the basis of physical observation.

Serial number-4.1: Write, yes if constituent crops in crop mixture are sown exclusively in separate rows (without any other crop in the same row), if not write no.

Serial number-4.2(i): If yes, take three physical observations at random in three places in the selected field including experimental plot and determine average number of rows of each constituent crop in the distance of 10 meters/5 meters (equal to side of CCE) and write the name of constituent crop and average number of rows at appropriate place.

Serial number-4.2(ii): Write normal distance between two rows of experimental crop sown as pure corp.

Serial number-4.3: Write, yes if constituent crops in crop mixture are sown with other crop by mixing the seed together (either in rows or otherwise), if not write no.

Serial number-4.4 (i): Write name of constituent crop and seed (Kg) used for sowing the area of selected filed at appropriate place.

Serial number-4.4 (ii): Write name of constituent crop and seed rate in Kg/ha for growing as pure crop at appropriate place.

5.0 Draw rough sketch of the selected field and south west corner of CCE plot: For each selected field, draw a rough sketch of the selected field and south west corner of CCE plot showing the directions and dimensions.

Primary worker should write the name in full and capital letters, put the signature with date after filling the schedule. Supervisor may also do the similar exercise after ensuring the quality and quantity of schedules filled by primary worker.

CCE Schedule–II: Details of produce (wet and dry) obtained from CCE plots

1. Please respond to every item, if any information is not available, write 'not available'. Tick appropriate items where choices are provided.

2. Fill separate schedule for each crop.

1.0 Particulars of the village: are self explanatory.

2.0 Particulars of selection of experimental plots: are also self explanatory. Particulars of selection of experimental plots are already written in CCE schedule–I and same may be copied from CCE schedule–I and also verified from the farmer again.

3.0 Information of inputs applied to the experimental crop after filling CCE schedule-1: The information on input applied shall be collected from farmer again for the period after filling CCE schedule-1 and till date. The items at serial number 3.1 to 3.13 are self explanatory. The farmer estimation written in CCE schedule-1 may vary because certain reasons, therefore, the same may be asked carefully from the farmer.

4.0 Results of harvesting and threshing:

Serial number-4.1: Write the shape and area in meter square of experimental plot.

Serial number-4.2: Write random number used for making the experimental plot.

Serial number-4.3: Write date fixed for harvesting as per schedule-I.

Serial number-4.4: Write state of crop maturity on the day of harvesting i.e. under ripens, normal, over ripen.

Serial number-4.5: Write yes if farmer harvest any part of the field prior to the harvest of the experimental plot.

Serial number-4.6: If yes, verify any portion of the experimental plot is harvested by the farmer.

Serial number-4.7: If yes, draw and write a new pair of random number for making the experimental plot.

Serial number-4.8: Write actual date of harvesting.

Serial number-4.9 to 4.28: are self explanatory.

Note:

* Form of produce to be recorded soon after harvest on the date of harvesting

- Paddy, Wheat, Barley, Gram, Oilseeds: Weight of undried grain, if threshed.
- Jowar, Bajra, Maize, Ragi: Number and weight of undried cobs
- Red gram and Sesamum: Number of bundles
- Groundnut: Weight of undried cleaned pods
- Sugarcane: Weight of stripped cane
- Cotton (Kapas): Pickings wise weight of kapas (Add more rows as per picking)
- Castor undried (capsules): Pickings wise weight of undried (capsules) (Add more rows as per picking)
- Tobacco: Pickings wise number and weight of green leaves (Add more rows as per picking)

** **Form of produce to be recorded after threshing/drying of harvested plants/cobs/pods**

(After threshing the seed should be exposed to the sun for a few hours)

- Weight of dried seed of Redgram/Sesamum after threshing: In case of Sesamum or similar crop where seeds may not come out at the 1st threshing, the weight should be recorded at every time soon after threshing and the total dried weight of Sesamum seed has to be noted.
- Weight of the dried grains of wheat, paddy, barley, gram, oilseeds.
- Jowar, Bajra, Ragi and Maize (cobs/grains).
- Groundnut (dried pods)
- Castor undried (capsules): Pickings wise weight of dried (capsules) and dry seed (Add more rows as per picking)
- Tobacco (cured leaf): Pickings wise number and weight of cured leaves (Add more rows as per picking)

Primary worker should write the name in full and capital letters, put the signature with date after filling the schedule. Supervisor may also do the similar exercise after ensuring the quality and quantity of schedules filled by primary worker.

પ્રોજેક્ટ: ભારત સરકાર તરફથી ખાદ્ય પાકના વિસ્તાર અને ઉત્પાદનનાં અંદાજેના અખતરનો પ્રોજેક્ટની કામગીરી માટેના મહત્વના મૂદાઓ

➤ આપને આ કામગીરી માટે કુલ (૬) પ્રશ્નાવલીઓ આપવામાં આવી છે.

૧) પ્રશ્નાવલી ૧: ગામની સામાન્ય માહિતી-
આપે ગામમાં સરપંચ, તલાટી કમ મંત્રી કે ગામના આગેવાનોને મળીને જરૂરી માહિતી મેળવવાની રહેશે.

૨) પ્રશ્નાવલી ૨: ગામ મોજણી -
આ પ્રશ્નાવલી ભરતા પહેલા ગામમાં મુખ્ય ધાન્ય પાકો, કઠોળ પાકોના વાવેતર વિસ્તાર વિશે માહિતી આપની જાણ માટે મેળવવાની રહેશે અને ધાન્ય કે કઠોળ પાકનો વિસ્તાર ન હોય તો જ ખાદ્ય તેલીબિયાંના વિસ્તારની માહિતી મેળવવી.

➤ પ્રશ્નાવલી ભરતાં પહેલાં ધ્યાનમાં આખવાના મુદ્દાઓ
૧) પ્રથમ આપે પસંદ કરેલ ખેડૂતોના ખેતરોની મુલાકાત લો ત્યાર બાદ પરાંદ થગેલ પાકોની ખેડૂતોને મળી પ્રશ્નાવલી સંપૂર્ણ ભરી લેવી.

૨) ત્યાર પછી આકૃતિ ૧ અને ૨ માં દર્શાવ્યા મુજબ આગળની કામગીરી કરવી.

૩) મુખ્ય પાકના પ્લોટ કે ખેતરની પસંદગી નૈઋત્ય દિશાનો જ પરંદ કરવો.

૪) પસંદ કરેલ પ્લોટ કે ખેતરની લંબાઈ અને પહોળાઈને પગલાંમાં ચાલીને ગણીને પ્રશ્નાવલીમાં નોંધવી. દા.ત. નૈઋત્ય ખૂણામાંથી પ્લોટની લંબાઈ ૨૬૫ પગલાં અને પહોળાઈ ૨૪૦ પગલાં.

૫) નૈઋત્ય ખૂણામાંથી લંબાઈ તરફ ૭ પગલાં અને પહોળાઈ તરફ ૭ પગલાંઓથી એક બિન્દુ નક્કી કરશો.

૬) આ નક્કી કરેલ બિન્દુથી ૫ મીટર લંબાઈ અને ૫ મીટર પહોળાઈ કુલ ૫ × ૫ નો ચોરસ મીટર વિસ્તાર નક્કી કરી વિસ્તારને ખૂંટી લગાવી શકય હોય તો દોરીથી બાંધી દેશો.

૭) કાપણીના સમયે આ જ વિસ્તારમાંથી અભ્યાસના પાકનું મેળવેલ ઉત્પાદન આપે નોધવાનું રહેશે.

૮) આ આવેલ પાકના ઉત્પાદનને સુકવ્યા પછી ફરીથી જે તે ખાનામાં તના વજનની માહિતી ભરવી.

➤ ખરીફ પાકની પ્રશ્નાવલી
ગામના મુખ્ય ધાન્ય કે કઠોળ પાકમાંથી માત્ર બે મુખ્ય પાકોના કાપણી અણતરાની માહિતી મેળવવાની છે. તેથી ગામ મોજણી કરવાના મુખ્ય મુદ્દા નીચે મુજબ આપેલ તે પ્રમાણે કામગીરી કરવાની રહેશે (ભરેલ પ્રશ્નાવલીનો અભ્યાસ પ્રથમ કરવો).

(૧) ગામમાં મુખ્ય ધાન્ય (દા.ત. બાજરી, ડાંગર, મકાઈ) કે કઠોળ (દા.ત. તુવેર, અડદ, મગ) હેઠળનો વિસ્તાર જાણી લેવો.

(૨) આપને આપેલ પ્રશ્નાવલીમાં પ્રથમ મુખ્ય પાકનું નામ અને બીજા મુખ્ય પાકનું નામ દર્શાવો. પ્રશ્નાવલીમાં કુલ પાંચ ખરીફ પાકના કોલમો આપેલ છે, રવિના કુલ બે કોલમો અને અંતે અન્ય પાકનું કોલમ આપેલ છે. તેમાં આપે બીનણાદ્ય પાકનું નામ અને વિસ્તાર દર્શાવવો.

(૩) આપને કુલ ૧૦૦ ગામના સર્વે નંબર અને ખેડૂતોના નામની યાદી આપેલ છે તે પ્રમાણે જ ઉપરોકત દર્શાવેલ માહિતી એકત્રિત કરવાની રહેશે (નમૂના મુજબ).

(૪) ૧૦૦ ખેડૂતોની મોજણી કરતી વખતે કયારેક ખેડૂત ન મળે, બહાર ગામ રહેતો હોય, ગામ છોડી દીધેલ હોય, જમીન વેચાણ કરેલ હોય તો તે જ કારણ દર્શાવવા.

(૫) મુખ્ય પાક મિશ્ર પાક સાથે કરેલ હોય તો મિશ્ર પાકનું નામ દર્શાવવું.

(૬) ગામમાં પ્રથમ મુખ્ય પાક ૧૦૦ ખેડૂતોમાંથી ૬૫ ખેડૂતોએ પાકની વાવણી/રોપણી કરેલ હોય તો (દા.ત. બાજરી) તેમાંથી માત્ર બે ખેડૂતોના પ્લોટની પસંદગી કરવાની છે.

(૭) આપને યદચ્છ કે રેન્ડમ ટેબલ એક ડીજિટ અને બે ડીજિટનું આપેલ છે તેમાંથી બે ડીજિટનું રેન્ડમ ટેબલનો ઉપયોગ કરી ૬૫ કે તેથી ઓછા નંબર તેનાં પ્રથમ કોલમથી શરૂઆત કરી શોધવાં. એમ કુલ બે ખેડૂતોનાં બે પ્લોટની પસંદગી કરવી અને તેમના ખેતરમાંથી પાકનાં (દા.ત. બાજરી) વિસ્તારની અને મેળવેલ ઉત્પાદનની વિસ્તૃત માહિતી ખરીફ પાક માટે પ્રશ્નાવલીમાં નોંધવી.

(૮) ઉપરોકત પદ્ધતિ મુજબ જ બીજો ખરીફ પાક (દા.ત. ડાંગર) ગામના ૨૪ ખેડૂતોએ કરેક હોય તો બે ડીજિટના ટેબલમાંથી ૨૪ કે તેથી નાનો નંબર પસંદ કરી બે ખેડૂતોની પરાંદગી કરી તેમના પાકના મેળવેલ ઉત્પાદનની વિસ્તૃત માહિતી ખરીફ પાક માટે પ્રશ્નાવલીમાં નોંધવી.

➤ રવિ પાકની પ્રશ્નાવલી
રવિ પાકોમાં ધાન્ય પાક તરીકે ઘઉં, જવ, કઠોળમાં ચણા અને ખાદ્ય તેલીબિયાંમાંથી રાઈડો આવશે. ગામમાં ૧૦૦ ખેડૂતોની મોજણી કરતી આ પાકોમાંથી સૌથી વધુ જે પાકનો વિસ્તાર વધુ હોય તેવા ખેડૂતોની યાદીમાંથી માત્ર બે ખેડૂતોના બે જ પ્લોટની પસંદ કરવી. ત્યાર પછી ખરીફ પાકો વિષે બતાવ્યા પ્રમાણે અને આકૃતિમાં દર્શાવ્યા મુજબ પ્લોટની પસંદગી કરી પ્રશ્નાવલીની માહિતી ખેડૂતોને મળી ભરવાની રહેશે.

આકૃતિ: રસોટ કે ખેતર પસંદગીની રીતનો નમૂનો
હા.વ. ગામનો કુલ સરકે પાસ ખાજરી
ખેતરનો વિસ્તાર ૧ હેકટર

દિશા
ઉત્તર

ગામનું કેન્દ્ર
દક્ષિણ
પૂર્વ

નૈઋત્ય

નીંગાળી રસોટ
(0.25 થા.)

ખેતરની રસોટ (0.25 હે)
(આકૃતિ)

આકૃતિ રસોટ- 1

આકૃતિ રસોટ (0.25 હે)
5×5 મીટરમાં
ખાજરીનું મોડેલ
ઉત્પાદન
ઘઉંક્ષેત્ર

આકૃતિ રસોટ- 2
ઈશાન દિશાની
ખાજરીની રસોટ
ઉત્તર કરવી

કેલ ૯ (0.25 હે)
રસોટ

5 મીટર

5 મીટર

A બિન્દુ

7 પગલાં
ધોરી

← 7 પગલાં ધોરી

265 પગલાં
લંબાઈ
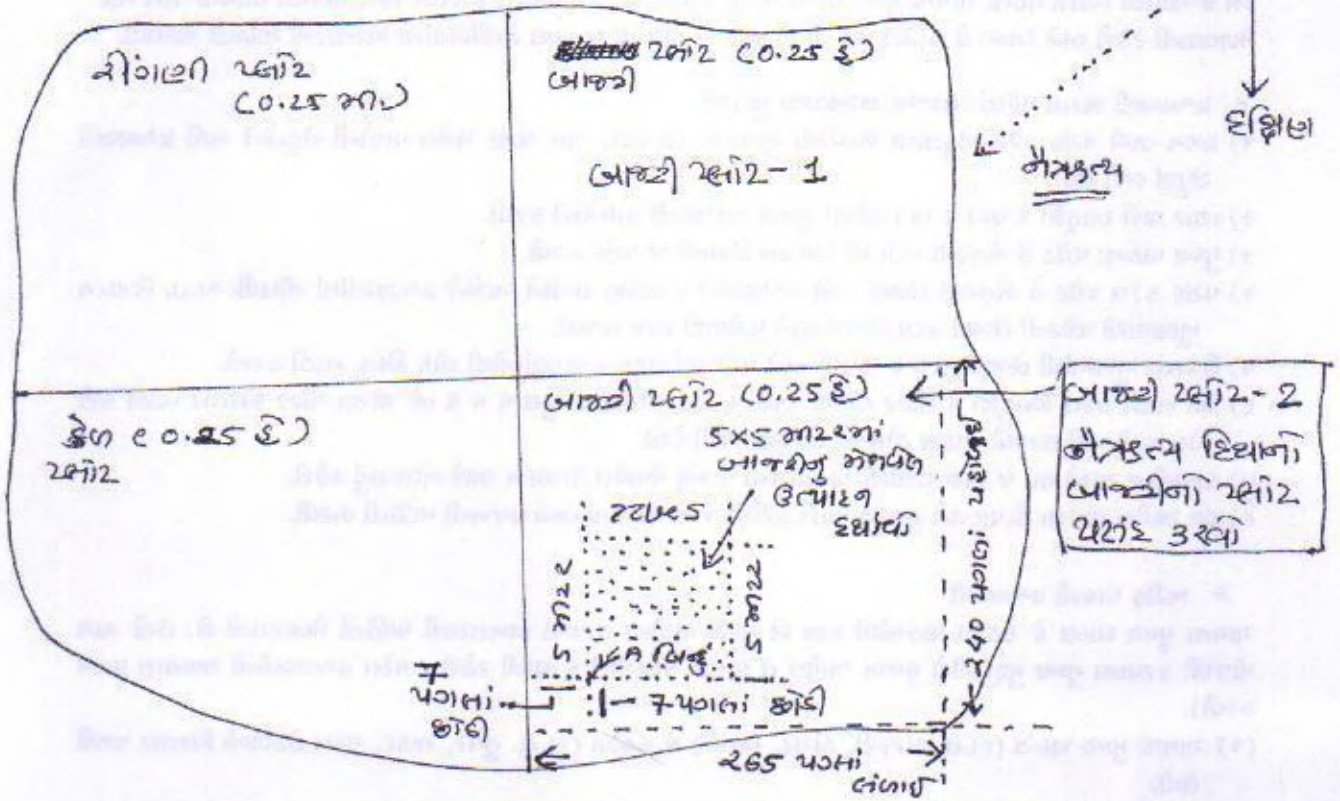
આકૃતિ: માત્ર એકજ રસોટ કે ખેતરમાં અખતરા હેઠળ. વિસ્તાર
ની પસંદગી કરવાની રીત
વિસ્તાર- 0.50 હેકટર ડાંગરની રસોટ/ખેતર

દિશા
ઉત્તર

ગામનું કેન્દ્ર
દક્ષિણ
પૂર્વ

નૈઋત્ય

5×5 મીટર વિસ્તારમાં
ડાંગરનું મોડેલ ઉત્પાદન
ધારવી.

5 મી

5

15 મી લંબાઈ

પહોળાઈ

A બિન્દુ

← 7 પગલાં ધોરી

← 2.11 પગલાં લંબાઈ

7 પગલાં ધોરી

Agro-Economic Research Centre
Vallabh
Vidyanagar
S.P.U.
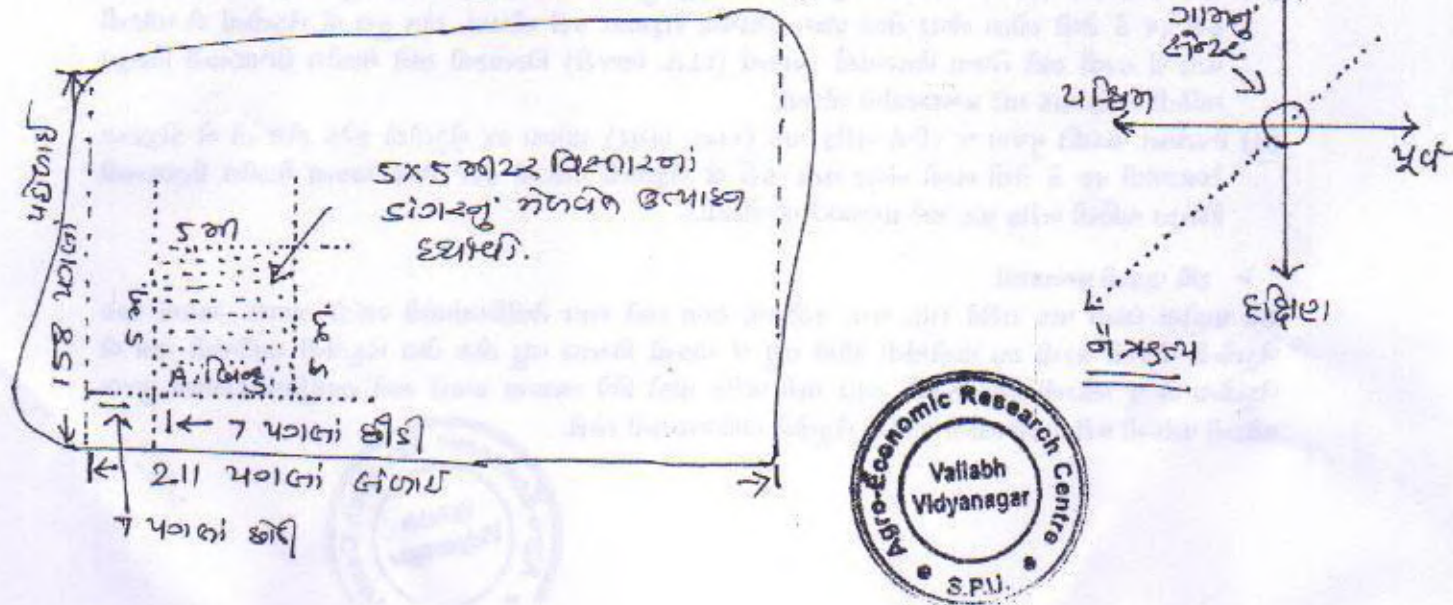
Appendix B. Random Number Tables

All of the sampling plans presented in this handbook are based on the assumption that the packages constituting the sample are chosen at random from the inspection lot. Randomness in this instance means that every package in the lot has an equal chance of being selected as part of the sample. It does not matter what other packages have already been chosen, what the package net contents are, or where the package is located in the lot.

To obtain a random sample, two steps are necessary. First it is necessary to identify each package in the lot of packages with a specific number whether on the shelf, in the warehouse, or coming off the packaging line. Then it is necessary to obtain a series of random numbers. These random numbers indicate exactly which packages in the lot shall be taken for the sample.

The Random Number Table

The random number tables in Appendix B are composed of the digits from 0 through 9, with approximately equal frequency of occurrence. This appendix consists of 8 pages. On each page digits are printed in blocks of five columns and blocks of five rows. The printing of the table in blocks is intended only to make it easier to locate specific columns and rows.

Random Starting Place

Starting Page. The Random Digit pages numbered B-2 through B-8. You can use the day of the week to determine the starting page or use the first page for the first lot you test in a location, the second page for the second lot and so on moving to the following page for each new lot.

Starting Column and Row. You may choose a starting page in the random number table and with eyes closed, drop a pencil anywhere on the page to indicate a starting place in the table.

For example, assume that testing takes place on the 3rd day of the week. Start with Table 3 of Appendix B. Assume you dropped your pencil on the page and it has indicated a starting place at column 22, row 45. That number is 1.

If 1-digit random numbers are needed, record them, going down the column to the bottom of the page and then to the top of the next column, and so on. Ignore duplicates and record zero (0) as ten (10). Following on from the last example, these numbers are 3, 2, 9, 8, etc. If two-digit random numbers are needed, rule off the pages, and further pages if necessary, in columns of two digits each. If there is a single column left on the page, ignore this column, and rule the next page in columns of two. Again, ignore duplicate numbers and record 00 as 100. For example, using the same starting place as in the last example (Table 3, column 22, row 45), the recorded two-digit recorded numbers would be 11, 34, 26, 95, etc.. When three-digit numbers are needed, rule the page in columns of three. Record 000 as 1000. Starting on Table 3, column 22, row 45, the recorded numbers would be 119, 346, 269, 959, etc..

TABLE 1 - RANDOM DIGITS

11164	36318	75061	37674	26320	75100	10431	20418	19228	91792
21215	91791	76831	58678	87054	31687	93205	43685	19732	08468
10438	44482	66558	37649	08882	90870	12462	41810	01806	02977
36792	26236	33266	66583	60881	97395	20461	36742	02852	50564
73944	04773	12032	51414	82384	38370	00249	80709	72605	67497
49563	12872	14063	93104	78483	72717	68714	18048	25005	04151
64208	48237	41701	73117	33242	42314	83049	21933	92813	04763
51486	72875	38605	29341	80749	80151	33835	52602	79147	08868
99756	26360	64516	17971	48478	09610	04638	17141	09227	10606
71325	55217	13015	72907	00431	45117	33827	92873	02953	85474
65285	97198	12138	53010	94601	15838	16805	61004	43516	17020
17264	57327	38224	29301	31381	38109	34976	65692	98566	29550
95639	99754	31199	92558	68368	04985	51092	37780	40261	14479
61555	76404	86210	11808	12841	45147	97438	60022	12645	62000
78137	98768	04689	87130	79225	08153	84967	64539	79493	74917
62490	99215	84987	28759	19177	14733	24550	28067	68894	38490
24216	63444	21283	07044	92729	37284	13211	37485	10415	36457
16975	95428	33226	55903	31605	43817	22250	03918	46999	98501
59138	39542	71168	57609	91510	77904	74244	50940	31553	62562
29478	59652	50414	31966	87912	87154	12944	49862	96566	48825
96155	95009	27429	72918	08457	78134	48407	26061	58754	05326
29621	66583	62966	12468	20245	14015	04014	35713	03980	03024
12639	75291	71020	17265	41598	64074	64629	63293	53307	48766
14544	37134	54714	02401	63228	26831	19386	15457	17999	18306
83403	88827	09834	11333	68431	31706	26652	04711	34593	22561
67642	05204	30697	44806	96989	68403	85621	45556	35434	09532
64041	99011	14610	40273	09482	62864	01573	82274	81446	32477
17048	94523	97444	59904	16936	39384	97551	09620	63932	03091
93039	89416	52795	10631	09728	68202	20963	02477	55494	39563
82244	34392	96607	17220	51984	10753	76272	50985	97593	34320
96990	55244	70693	25255	40029	23289	48819	07159	60172	81697
09119	74803	97303	88701	51380	73143	98251	78635	27556	20712
57666	41204	47589	78364	38266	94393	70713	53388	79865	92069
46492	61594	26729	58272	81754	14648	77210	12923	53712	87771
08433	19172	08320	20839	13715	10597	17234	39355	74816	03363
10011	75004	86054	41190	10061	19660	03500	68412	57812	57929
92420	65431	16530	05547	10683	88102	30176	84750	10115	69220
35542	55865	07304	47010	43233	57022	52161	82976	47981	46588
86595	26247	18552	29491	33712	32285	64844	69395	41387	87195
72115	34985	58036	99137	47482	06204	24138	24272	16196	04393
07428	58863	96023	88936	51343	70958	96768	74317	27176	29600
35379	27922	28906	55013	26937	48174	04197	36074	65315	12537
10982	22807	10920	26299	23593	64629	57801	10437	43965	15344
90127	33341	77806	12446	15444	49244	47277	11346	15884	28131
63002	12990	23510	68774	48983	20481	59815	67248	17076	78910
40779	86382	48454	65269	91239	45989	45389	54847	77919	41105
43216	12608	18167	84631	94058	82458	15139	76856	86019	47928
96167	64375	74108	93643	09204	98855	59051	56492	11933	64958
70975	62693	35684	72607	23026	37004	32989	24843	01128	74658
85812	61875	23570	75754	29090	40264	80399	47254	40135	69916

TABLE 2 – RANDOM DIGITS

40603	16152	83235	37361	98783	24838	39793	80954	76865	32713
40941	53585	69958	60916	71018	90561	84505	53980	64735	85140
73505	83472	55953	17957	11446	22618	34771	25777	27064	13526
39412	16013	11442	89320	11307	49396	39805	12249	57656	88686
57994	76748	54627	48511	78646	33287	35524	54522	08795	56273
61834	59199	15469	82285	84164	91333	90954	87186	31598	25942
91402	77227	79516	21007	58602	81418	87838	18443	76162	51146
58299	83880	20125	10794	37780	61705	18276	99041	78135	99661
40684	99948	33880	76413	63839	71371	32392	51812	48248	96419
75978	64298	08074	62055	73864	01926	78374	15741	74452	49954
34556	39861	88267	76068	62445	64361	78685	24246	27027	48239
65990	57048	25067	77571	77974	37634	81564	98608	37224	49848
16381	15069	25416	87875	90374	86203	29677	82543	37554	89179
52458	88880	78352	67913	09245	47773	51272	06976	99571	33365
33007	85607	92008	44897	24964	50559	79549	85658	96865	24186
38712	31512	08588	61490	72294	42862	87334	05866	66269	43158
58722	03678	19186	69602	34625	75958	56869	17907	81867	11535
26188	69497	51351	47799	20477	71786	52560	66827	79419	70886
12893	54048	07255	86149	99090	70958	50775	31768	52903	27645
33186	81346	85095	37282	85536	72661	32180	40229	19209	74939
79893	29448	88392	54211	61708	83452	61227	81690	42265	20310
48449	15102	44126	19438	23382	14985	37538	30120	82443	11152
94205	04259	68983	50561	06902	10269	22216	70210	60736	58772
38648	09278	81313	77400	41126	52614	93613	27263	99381	49500
04292	46028	75666	26954	34979	68381	45154	09314	81009	05114
17026	49737	85875	12139	59391	81830	30185	83095	78752	40899
48070	76848	02531	97737	10151	18169	31709	74842	85522	74092
30159	95450	83778	46115	99178	97718	98440	15076	21199	20492
12148	92231	31361	60650	54695	30035	22765	91386	70399	79270
73838	77067	24863	97576	01139	54219	02959	45696	98103	78867
73547	43759	95632	39555	74391	07579	69491	02647	17050	49869
07277	93217	79421	21769	83572	48019	17327	99638	87035	89300
65128	48334	07493	28098	52087	55519	83718	60904	48721	17522
38716	61380	60212	05099	21210	22052	01780	36813	19528	07727
31921	76458	73720	08657	74922	61335	41690	41967	50691	30508
57238	27464	61487	52329	26150	79991	64398	91273	26824	94827
24219	41090	08531	61578	08236	41140	76335	91189	66312	44000
31309	49387	02330	02476	96074	33256	48554	95401	02642	29119
20750	97024	72619	66628	66509	31206	55293	24249	02266	39010
28537	84395	26654	37851	80590	53446	34385	86893	87713	26842
97929	41220	86431	94485	28778	44997	38802	56594	61363	04206
40568	33222	40486	91122	43294	94541	40988	02929	83190	74247
41483	92935	17061	78252	40498	43164	68646	33023	64333	64083
93040	66476	24990	41099	65135	37641	97613	87282	63693	55299
76869	39300	84978	07504	36835	72748	47644	48542	25076	68626
02982	57991	50765	91930	21375	35604	29963	13738	03155	59914
94479	76500	39170	06629	10031	48724	49822	44021	44335	26474
52291	75822	95966	90947	65031	75913	52654	63377	70664	60082
03684	03600	52831	55381	97013	19993	41295	29118	18710	64851
58939	28366	86765	67465	45421	74228	01095	50987	83833	37216

TABLE 3 – RANDOM DIGITS

37100	62492	63642	47638	13925	80113	88067	42575	44078	62703
53406	13855	38519	29500	62479	01036	87964	44498	07793	21599
55172	81556	18856	59043	64315	38270	25677	01965	21310	28115
40353	84807	47767	46890	16053	32415	60259	99788	55924	22077
18899	09612	77541	57675	70153	41179	97535	82889	27214	03482
68141	25340	92551	11326	60939	79355	41544	88926	09111	86431
51559	91159	81310	63251	91799	41215	87412	35317	74271	11603
92214	33386	73459	79359	65867	39269	57527	69551	17495	91456
15089	50557	33166	87094	52425	21211	41876	42525	36625	63964
96461	00604	11120	22254	16763	19206	67790	88362	01880	37911
28177	44111	15705	73835	69399	33602	13660	84342	97667	80847
66953	44737	81127	07493	07861	12666	85077	95972	96556	80108
19712	27263	84575	49820	19837	69985	34931	67935	71903	82560
68756	64757	19987	92222	11691	42502	00952	47981	97579	93408
75022	65332	98606	29451	57349	39219	08585	31502	96936	96356
11323	70069	90269	89266	46413	61615	66447	49751	15836	97343
55208	63470	18158	25283	19335	53893	87746	72531	16826	52605
11474	08786	05594	67045	13231	51186	71500	50498	59487	48677
81422	86842	60997	79669	43804	78690	58358	87639	24427	66799
21771	75963	23151	90274	08275	50677	99384	94022	84888	80139
42278	12160	32576	14278	34231	20724	27908	02657	19023	07190
17697	60114	63247	32096	32503	04923	17570	73243	76181	99343
05686	30243	34124	02936	71749	03031	72259	26351	77511	00850
52992	46650	89910	57395	39502	49738	87854	71066	84596	33115
94518	93984	81478	67750	89354	01080	25988	84359	31088	13655
00184	72186	78906	75480	71140	15199	69002	08374	22126	23555
87462	63165	79816	61630	50140	95319	79205	79202	67414	60805
88692	58716	12273	48176	86038	78474	76730	82931	51595	20747
20094	42962	41382	16768	13261	13510	04822	96354	72001	68642
60935	81504	50520	82153	27892	18029	79663	44146	72876	67843
51392	85936	43898	50596	81121	98122	69196	54271	12059	62539
54239	41918	79526	46274	24853	67165	12011	04923	20273	89405
57892	73394	07160	90262	48731	46648	70977	58262	78359	50436
02330	74736	53274	44468	53616	35794	54838	39114	68302	26855
76115	29247	55342	51299	79908	36613	68361	18864	13419	34950
63312	81886	29085	20101	38037	34742	78364	39356	40006	49800
27632	21570	34274	56426	00330	07117	86673	46455	66866	76374
06335	62111	44014	52567	79480	45886	92585	87828	17376	35254
64142	87676	21358	88773	10604	62834	63971	03989	21421	76086
28436	25468	75235	75370	63543	76266	27745	31714	04219	00699
09522	83855	85973	15888	29554	17995	37443	11461	42909	32634
93714	15414	93712	02742	34395	21929	38928	31205	01838	60000
15681	53599	58185	73840	88758	10618	98725	23146	13521	47905
77712	23914	08907	43768	10304	61405	53986	61116	76164	54958
78453	54844	61509	01245	91199	07482	02534	08189	62978	55516
24860	68284	19367	29073	93464	06714	45268	60678	58506	23700
37284	06844	78887	57276	42695	03682	83240	09744	63025	60997
35488	52473	37634	32569	39590	27379	23520	29714	03743	08444
51595	59909	35223	44991	29830	56614	59661	83397	38421	17503
90660	35171	30021	91120	78793	16827	89320	08260	09181	53616

TABLE 4 – RANDOM DIGITS

54723	56527	53076	38235	42780	22716	36400	48028	78196	92985
84828	81248	25548	34075	43459	44628	21866	90350	82264	20478
65799	01914	81363	05173	23674	41774	25154	73003	87031	94368
87917	38549	48213	71708	92035	92527	55484	32274	87918	22455
26907	88173	71189	28377	13785	87469	35647	19695	33401	51998
68052	65422	88460	06352	42379	55499	60469	76931	83430	24560
42587	68149	88147	99700	56124	53239	38726	63652	36644	50876
97176	55416	67642	05051	89931	19482	80720	48977	70004	03664
53295	87133	38264	94708	00703	35991	76404	82249	22942	49659
23011	94108	29196	65187	69974	01970	31667	54307	40032	30031
75768	49549	24543	63285	32803	18301	80851	89301	02398	99891
86668	70341	66460	75648	78678	27770	30245	44775	56120	44235
56727	72036	50347	33521	05068	47248	67832	30960	95465	32217
27936	78010	09617	04408	18954	61862	64547	52453	83213	47833
31994	69072	37354	93025	38934	90219	91148	62757	51703	84040
02985	95303	15182	50166	11755	56256	89546	31170	87221	63267
89965	10206	95830	95406	33845	87588	70237	84360	19629	72568
45587	29611	98579	42481	05359	36578	56047	68114	58583	16313
01071	08530	74305	77509	16270	20889	99753	88035	55643	18291
90209	68521	14293	39194	68803	32052	39413	26883	83119	69623
04982	68470	27875	15480	13206	44784	83601	03172	07817	01520
19740	24637	97377	32112	74283	69384	49768	64141	02024	85380
50197	79869	86497	68709	42073	28498	82750	43571	77075	07123
46954	67536	28968	81936	95999	04319	09932	66223	45491	69503
82549	62676	31123	49899	70512	95288	15517	85352	21987	08669
61798	81600	80018	84742	06103	60786	01408	75967	29948	21454
57666	29055	46518	01487	30136	14349	56159	47408	78311	25896
29805	64994	66872	62230	41385	58066	96600	99301	85976	84194
06711	34939	19599	76247	87879	97114	74314	39599	43544	36255
13934	46885	58315	88366	06138	37923	11192	90757	10831	01580
28549	98327	99943	25377	17628	65468	07875	16728	22602	33892
40871	61803	25767	55484	90997	86941	64027	01020	39518	34693
47704	38355	71708	80117	11361	88875	22315	38048	42891	87885
62611	19698	09304	29265	07636	08508	23773	56545	08015	28891
03047	83981	11916	09267	67316	87952	27045	62536	32180	60936
26460	50501	31731	18938	11025	18515	31747	96828	58258	97107
01764	25959	69293	89875	72710	49659	66632	25314	95260	22146
11762	54806	02651	52912	32770	64507	59090	01275	47624	16124
31736	31695	11523	64213	91190	10145	34231	36405	65860	48771
97155	48706	52239	21831	49043	18650	72246	43729	63368	53822
31181	49672	17237	04024	65324	32460	01566	67342	94986	36106
32115	82683	67182	89030	41370	50266	19505	57724	93358	49445
07068	75947	71743	69285	30395	81818	36125	52055	20289	16911
26622	74184	75166	96748	34729	61289	36908	73686	84641	45130
02805	52676	22519	47848	68210	23954	63085	87729	14176	45410
32301	58701	04193	30142	99779	21697	05059	26684	63516	75925
26339	56909	39331	42101	01031	01947	02257	47236	19913	90371
95274	09508	81012	42413	11278	19354	68661	04192	36878	84366
24275	39632	09777	98800	48027	96908	08177	15364	02317	89548
36116	42128	65401	94199	51058	10759	47244	99830	64255	40516

TABLE 5 – RANDOM DIGITS

47505	02008	20300	87188	42505	40294	04404	59286	95914	07191
13350	08414	64049	94377	91059	74531	56228	12307	87871	97064
33006	92690	69248	97443	38841	05051	33756	24736	43508	53566
55216	63886	06804	11861	30968	74515	40112	40432	18682	02845
21991	26228	14801	19192	45110	39937	81966	23258	99348	61219
71025	28212	10474	27522	16356	78456	46814	28975	01014	91458
65522	15242	84554	74560	26206	49520	65702	54193	25583	54745
27975	54923	90650	06170	99006	75651	77622	20491	53329	12452
07300	09704	36099	61577	34632	55176	87366	19968	33986	46445
54357	13689	19569	03814	47873	34086	28474	05131	46619	41499
00977	04481	42044	08649	83107	02423	46919	59586	58337	32280
13920	78761	12311	92808	71581	85251	11417	85252	61312	10266
08395	37043	37880	34172	80411	05181	58091	41269	22626	64799
46166	67206	01619	43769	91727	06149	17924	42628	57647	76936
87767	77607	03742	01613	83528	66251	75822	83058	97584	45401
29880	95288	21644	46587	11576	30568	56687	83239	76388	17857
36248	36666	14894	59273	04518	11307	67655	08566	51759	41795
12386	29656	30474	25964	10006	86382	46680	93060	52337	56034
52068	73801	52188	19491	76221	45685	95189	78577	36250	36082
41727	52171	56719	06054	34898	93990	89263	79180	39917	16122
49319	74580	57470	14600	22224	49028	93024	21414	90150	15686
88786	76963	12127	25014	91593	98208	27991	12539	14357	69512
84866	95202	43983	72655	89684	79005	85932	41627	87381	38832
11849	26482	20461	99450	21636	13337	55407	01897	75422	05205
54966	17594	57393	73267	87106	26849	68667	45791	87226	74412
10959	33349	80719	96751	25752	17133	32786	34368	77600	41809
22784	07783	35903	00091	73954	48706	83423	96286	90373	23372
86037	61791	33815	63968	70437	33124	50025	44367	98637	40870
80037	65089	85919	74391	36170	82988	52311	59180	37846	98028
72751	84359	15769	13615	70866	37007	74565	92781	37770	76451
18532	03874	66220	79050	66814	76341	42452	65365	07167	90134
22936	22058	49171	11027	07066	14606	11759	19942	21909	15031
66397	76510	81150	00704	94990	68204	07242	82922	65745	51503
89730	23272	65420	35091	16227	87024	56662	59110	11158	67508
81821	75323	96068	91724	94679	88062	13729	94152	59343	07352
94377	82554	53586	11432	08788	74053	98312	61732	91248	23673
68485	49991	53165	19865	30288	00467	98105	91483	89389	61991
07330	07184	86788	64577	47692	45031	36325	47029	27914	24905
10993	14930	35072	36429	26176	66205	07758	07982	33721	81319
20801	15178	64453	83357	21589	23153	60375	63305	37995	66275
79241	35347	66851	79247	57462	23893	16542	55775	06813	63512
43593	39555	97345	58494	52892	55080	19056	96192	61508	23165
29522	62713	33701	17186	15721	95018	76571	58615	35836	66260
88836	47290	67274	78362	84457	39181	17295	39626	82373	10883
65905	66253	91482	30689	81313	01343	37188	37756	04182	19376
44798	69371	07865	91756	42318	63601	53872	93610	44142	89830
35510	99139	32031	27925	03560	33806	85092	70436	94777	57963
50125	93223	64209	49714	73379	89975	38567	44316	60262	10777
25173	90038	63871	40418	23818	63250	05118	52700	92327	55449
68459	90094	44995	93718	83654	79311	18107	12557	09179	28416

TABLE 6 – RANDOM DIGITS

96195	07059	13266	31389	87612	88004	31843	83469	22793	14312
22408	94958	19095	58035	43831	32354	83946	57964	70404	32017
53896	23508	16227	56929	74329	12264	26047	66844	47383	42202
22565	02475	00258	79018	70090	37914	27755	00872	71553	56684
49438	20772	60846	69732	07612	70474	46483	21053	95475	53448
65620	34684	00210	04863	01373	19978	61682	69315	46766	83768
20246	26941	41298	04763	19769	25865	95937	03545	93561	73871
09433	09167	35166	32731	73299	41137	37328	28301	61629	05040
95552	73456	16578	88140	80059	50296	07656	01396	83099	09718
76053	05150	69125	69442	16509	03495	26427	58780	27576	31342
34822	35843	78468	82380	52313	71070	71273	10768	86101	51474
07753	04073	58520	80022	28185	16432	86909	82347	10548	83929
04204	94434	62798	81902	29977	57258	87826	35003	46449	76636
96770	19440	29700	42093	64369	69176	29732	37389	34054	28680
65989	62843	10917	34458	81936	84775	39415	10622	36102	16753
06644	94784	66995	61812	54215	01336	75887	57685	66114	76984
88950	46077	34651	12038	87914	20785	39705	73898	12318	78334
21482	95422	02002	33671	46764	50527	46276	77570	68457	62199
55137	61039	02006	69913	11291	87215	89991	26003	55271	08153
98441	81529	59607	65225	49051	28328	85535	37003	87211	10204
57168	30458	23892	07825	53447	53511	09315	42552	43135	57892
71886	65334	38013	09379	83976	42441	14086	33197	82671	05037
40418	59504	52383	07232	14179	59693	37668	26689	93865	78925
28833	76661	47277	92935	63193	94862	60560	72484	29755	40894
37883	62124	62199	49542	55083	20575	44636	92282	52105	77664
44882	33592	66234	13821	86342	00135	87938	57995	34157	99858
19082	13873	07184	21566	95320	28968	31911	06288	77271	76171
45316	29283	89318	55806	89338	79231	91545	55477	19552	03471
22788	55433	31188	74882	44858	69655	08096	70982	61300	23792
08293	86193	05026	21255	63082	92946	28748	25423	45282	57821
29223	70541	67115	84584	10100	33854	26466	77796	70698	99393
22681	80110	31595	09246	39147	11158	43298	36220	88841	11271
74580	90354	43744	22178	38084	60027	24201	71686	59767	33274
69093	71364	08107	96952	50005	30297	97417	89575	04676	35616
40456	91234	58090	65342	95002	28447	21'700	43137	13746	85959
72927	67349	83962	58912	59734	76323	02913	46306	53956	38936
61869	33093	81129	06481	89281	83629	81960	63704	56329	10357
40048	16520	07638	10797	22270	57350	72214	36410	95526	87614
68773	97669	28656	89938	12917	25630	08068	19445	76250	24727
09774	30751	49740	11385	91468	28900	76804	52460	52320	70493
46139	36689	82587	13586	35061	76128	38568	62300	43439	53434
26566	95323	32993	89988	12152	01862	93113	33875	31730	62941
06765	57141	48617	18282	13086	76064	83334	70192	15972	80429
35384	90380	12317	89702	33091	68835	62960	38010	52710	87604
49333	78482	36199	11355	86044	88760	03724	22927	91716	92332
45595	14044	56806	99126	85584	87750	78149	22723	48245	78126
79819	15054	76174	12206	06886	06814	43285	20008	75345	19779
11971	62234	74857	46401	20817	57591	41189	49604	29604	30660
11452	89318	53084	21993	62471	74101	61217	76536	58393	63718
38746	81271	96260	98137	60275	22647	33103	50090	29395	10016

TABLE 7 – RANDOM DIGITS

93369	13044	69686	78162	29132	51544	17925	56738	32683	83153
19360	55049	94951	76341	38159	31008	41476	05278	03909	02299
47798	89890	06893	65483	97658	74884	38611	27264	26956	83504
69223	32007	03513	61149	66270	73087	16795	76845	44645	44552
34511	50721	84850	34159	38985	75384	22965	55366	81632	78872
54031	59329	58963	52220	76806	98715	67452	78741	58128	00077
66722	85515	04723	92411	03834	12109	85185	37350	93614	15351
71059	07496	38404	18126	37894	44991	45777	02070	38159	23930
45478	86066	31135	33243	01190	47277	55146	56130	70117	83203
97246	91121	89437	20393	76598	99458	76665	83793	37448	32664
22982	25936	96417	34845	28942	65569	38253	77182	12996	19505
48243	62993	47132	85248	79160	90981	71696	79609	33809	60839
93514	14915	67960	82203	22598	94802	75332	95585	69542	79924
69707	98303	93069	16216	01542	51771	16833	20922	94415	27617
87467	91794	70814	12743	17543	04057	71231	11309	32780	83270
81006	81498	59375	30502	44868	81279	23585	49678	70014	10523
15458	83481	50187	43375	56644	72076	59403	65469	74760	69509
33469	12510	23095	48016	22064	39774	07373	10555	33345	21787
67198	07176	65996	18317	83083	11921	06254	68437	59481	54778
58037	92261	85504	55690	63488	26451	43223	38009	50567	09191
84983	68312	25519	56158	22390	12823	92390	28947	36708	25393
35554	02935	72889	68772	79774	14336	50716	63003	86391	94074
04368	17632	50962	71908	13105	76285	31819	16884	11665	16594
81311	60479	69985	30952	93067	70056	55229	83226	22555	66447
03823	89887	55828	74452	21692	55847	15960	47521	27784	25728
80422	65437	38797	56261	88300	35980	56656	45662	29219	49257
61307	49468	43344	43700	14074	19739	03275	99444	62545	23720
83873	82557	10002	80093	74645	33109	15281	38759	09342	69408
38110	16855	28922	93758	22885	36706	92542	60270	99599	17983
43892	91189	87226	56935	99836	85489	89693	49475	31941	78065
93683	09664	53927	49885	94979	88848	42642	93218	80305	49428
32748	02121	11972	96914	83264	89016	45140	20362	63242	86255
49211	92963	38625	65312	52156	36400	67050	64058	45489	24165
63365	64224	69475	57512	85097	05054	88673	96593	00902	53320
63576	26373	44610	43748	90399	06770	71609	90916	69002	57180
41078	47036	65524	68466	77613	20076	71969	47706	22506	81053
70846	89558	64173	15381	67322	70097	82363	90767	17879	32697
68800	64492	20162	32707	69510	82465	26821	79917	34615	35820
44977	89525	51269	63747	30997	97213	53016	65909	05723	50168
79354	63847	24395	53679	07667	67993	24634	78867	78516	00448
14954	22299	40156	52685	19093	06090	23800	06739	76836	19050
01711	98439	09446	33937	98956	85676	89493	05132	45886	49379
62328	55328	45738	93940	15772	81975	91017	21387	57949	13992
73004	62109	81907	71077	50322	66093	79921	61412	18347	21115
34218	89445	03609	52336	19005	15179	94958	99448	11612	76981
99159	01968	45886	86875	05196	64297	59339	39878	61548	56442
92858	29949	15817	93372	34732	61584	72007	58597	43802	51066
27396	97477	65554	71601	01540	26509	19487	39684	18676	41219
37103	45309	30129	43380	66638	10841	77292	40288	25826	61431
57347	97012	48428	20606	54138	75716	23741	50462	13221	47216

જા.નં.ઇકોસ્ટેટ/સીઇએસ-૧/૨૦૨૬૩-૪૦૬/૨૦૧૬

ખેતી નિયામકની કચેરી , ગુ.રા.
કૃષિભવન , સેક્ટર-૧૦ એ,
ગાંધીનગર.
તારીખ : ૪૦ /૧૦/૨૦૧૬

પ્રતિ,
જિલ્લા ખેતીવાડી અધિકારીશ્રી
જિલ્લા પંચાયત કાર્યાલય...તમામ......
જિ ....તમામ.......

વિષય : પાક કાપણી અખતરાની કામગીરીમાં સાથ સહકાર આપવા બાબત.
સંદર્ભ: AERC નો અત્ર ક્રમાંક No.AERC/1.40.6/376/2016, 28/09/2016.

ઉપર્યુક્ત વિષય અને સંદર્ભ અન્વયે જણાવવાનું કે વર્ષ ૨૦૧૬-૧૭ માટે Pilot study for developing state level estimates of crop area and production on the basis of sample sizes recommended by Prof. Vaidyanathan Committee report" Indian Agricultural Statistics Research Institute-ICAR, New Delhi દ્વારા ગુજરાત રાજ્ય માટે અંદાજીત ૬૦૦ ગામોમાં ત્રણ પાક માટે પાક દિઠ બે પાક કાપણી અખતરા ગોઠવવાનું આયોજન Agro-Economic Research Centre, S. P. University, Anand મારફત કરવામાં આવેલ છે. જે અન્વયે આપશ્રીની કક્ષાએથી ગ્રામસેવકો અને ખેતી મદદનીશો દ્વારા તેઓશ્રીના મેનપાવરને ને સાથ સહકાર આપવા અંગેની સૂચના આપવા જણાવવામાં આવે છે.

સામેલ : ઉપર મુજબ

રવાના કર્યુ

નાયબ ખેતી નિયામક (અંક)
ગુ.રા.ગાંધીનગર

-સહી-
ખેતી નિયામક
ગુ.રા.ગાંધીનગર

નકલ સવિનય રવાના :

૧. સંયુક્ત ખેતી નિયામકશ્રી(વિ.)...તમામ......વિભાગ..તમામ......તરફ જાણ તથા પાક કાપણી અખતરાની કામગીરીનુ વખતો વખત પત્રો/સુચનાઓ મુજબ અમલીકરણ થાય તે જોવા સારૂ.

૨. નાયબ ખેતી નિયામકશ્રી (વિ.)..તમામ......જિ ..તમામ......તરફ જાણ તથા ઘટતી કાર્યવાહી સારૂ.

૩. મદદનીશ ખેતી નિયામક (વિ.) તાલીમ અને મુલાકાત યોજના, પેટાવિભાગ..તમામ...જિ..તમામ....... તરફ જાણ તથા ઘટતી કાર્યવાહી સારૂ.

૪. ડાયરેક્ટર અને પ્રોફેસર, એઇઆરસી, વલ્લભવિધાનગર, આણંદ તરફ જાણ સારૂ.

Comprehensive Scheme to Study the
Cost of Cultivation of Principal Crops in Gujarat
(Ministry of Agriculture and Farmers Welfare, Govt. of India)
Agro-Economic Research Centre
H. M. Patel Institute of Rural Development, P.B. No. 24
SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar 388 120, Dist. Anand, Gujarat, India
Tel.: +91-2692-230799/230106, Fax : +91-2692-233106, Website : www.aercspu.ac.in
Email : ccsgujarat@gmail.com, foccsguj@gmail.com, director.aerc@gmail.com

CCS, Gujarat
AERC, SPU, VVN
Established - July 1970

તા: ૧૦/૧૦/૨૦૧૬
સર્દભ: એઇઆરસી/૧.૪૦.૬/૩૬૫/૨૦૧૬

પ્રતિશ્રી

સરપંચશ્રી / તલાટી કમ મંત્રીશ્રી / ....

ગામ- ....

તા- ...., જી-.....................

વિષય: ભારત સરકાર તરફથી ખાધ પાકના વિસ્તાર અને ઉત્પાદનનાં અંદાજોના અખતરાનો
પ્રોજેક્ટ માટે સહકાર અને મદદ આપવા બાબતે

રેફ.: ૧) ખેતી નિયામકની કચેરી, કૃષિ ભવન, ગાંધીનગરનો પત્ર Ecostate/CES/Pilot Project/17481-
82/2015, dated 22.09.2015

૨) ખેતી નિયામકની કચેરી, કૃષિ ભવન, ગાંધીનગરનો પત્ર Ecostate/CES1/20283-401/2016, dated
10.10.2016

જય ભારત સાથે જણાવવાનું કે ભારત સરકારે ઉપરોક્ત દશવિલ પ્રોજેક્ટની કામગીરી ઇન્ડિયન કાઉન્સીલ ફોર એગ્રીકલ્ચર રીસર્ચ, નવી દિલ્હી અને ખેતી નિયામકની કચેરી, કૃષિ ભવન, ગાંધીનગર તરફથી એગ્રો ઇકોનોમીકસ રીસર્ચ સેન્ટરને આપવામાં આવેલ છે. સરકાર તરફથી ગુજરાત રાજયના ખાધ પાકોના વિસ્તાર (ધાન્ય, કઠોળ કે ખાધ તેલીબીયા) અને ઉત્પાદનનાં અંદાજે અખતરાં પધ્ધતિ મેળવવા છે. આ પ્રોજેક્ટ માટે આપના ગામની પસંદગી થયેલ છે. આપના ગામમાં મુખ્ય બે ખરીફ ખાધ પાકો અને એક રવિ ખાધ પાકના (ધાન્ય, કઠોળ કે ખાધ તેલીબીયા) અખતરાથી મેળવેલ ઉત્પાદનનાં અંદાજોની વિસ્તૃત માહિતી મેળવવાની છે. આ કામગીરી માટે શ્રી ....
.... ને આપના ગામમાં નિયુક્ત કરેલ છે. તેમને ઉપરોક્ત કામગીરીમાં સંપૂર્ણ મદદ અને સહકાર આપવા માટે આપને વિનંતી કરવામાં આવે છે.

આ પ્રોજેક્ટ માટે તેમને ૧૦૦ ખેડુતોની યાદી આપવામાં આવેલ છે. આ યાદી પ્રમાણે તેઓ ગામની મોજણી કરી ખરીફના બે પાકોના બે ખેડુતો અને રવિના એક પાકના એક ખેડૂતોની અખતરા પધ્ધતિ હેઠળ મેળવેલ ઉત્પાદનનાં અંદાજોની વિસ્તૃત માહિતી મેળવવાના છે. તો આપશ્રી આ કામગીરી માટે પસંદ થયેલ ખેડૂતોને મદદ કરવા જણાવશો.

સરકારના આ કામગીરી માટે સહકારની અપેક્ષા સહ

ફિલ્ડ ઓફિસર
(એસ. આર. ભૈયા)

નિયામકશ્રી
(એસ. એસ. કલામકર)

નિરીક્ષકનું નામ ....મો.....................સહિ ....
ગામ- ...., તા-...................., જી-.....................

Pilot Study for Developing State level Estimates of Crop Area and Production on the basis of Sample Sizes Recommended by Professor Vaidyanathan Committee Report

Agro-Economic Research Centre
(Ministry of Agriculture and Farmers Welfare, Govt. of India)
Sardar Patel University, Vallabh Vidyanagar 388120, Anand, Gujarat

CCE Field Visit Report

Date of Visit: / /201 **Time of Visit:** _____

Name of village: _____ **GP:_____** **Ta._____** **Dist. _____**

Name of the selected farmer: **Shri_____**

Name of Field Investigator: Shri_____

Details on CCE undertaken:

- ➢ Regarding selection of farmer and plot: _____
- ➢ Survey number of the plot: _____ Area of the plot: _____
- ➢ Kharif crops selected for the CCE: _____
- ➢ Field layout has been done in the prescribed plot (5*5) properly or not:
- ➢ Yield of selected crop/s (q/ha or mann/bigha):(a): Eye estimation: _____ (b) Actual yield:
  (c) Wet condition yield: _____ (d) Dry condition yield: _____
- ➢ All units have been correctly recorded or not (1ha=….bigha etc.):
- ➢ Rabi crops and area grown by the farmer:
- ➢ Details about seed rates, types of crop (hyv/local), labour rates, crop diseases, if any (for CCE crops):
- ➢ Availability of irrigation provision:

Suggestion/feedback of the farmer on CCE crops:

Suggestion/feedback of Village Leaders/Representative on Rabi crops and other agricultural situations:

Village Representative (Sarpanch/Talathi/Mantri etc.): **Farmer/s:**

Field Investigator: **Field Supervisor/s:**

Field Visit Report by Field Investigator

Name of the Investigator:_____

Mobile Number: _____

Talukas Covered:_____

No. of Villages given for supervision:_____

Sr. No.	Name of Village	Taluka	District	Name of Field Level Worker FLW	Mobile No of FLW	Village/CCE Visited	Remarks

Date: _____   **Signature of Investigator:_____**