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Statistics on Farmers and Farm Management for furthering synthesis of agricultural development and related policy analysis¹

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ABSTRACT

The ‘*Global Strategy to Improve Agricultural and Rural Statistics*’ (UNESC-2010) as well as the endeavors of *Wye City Group* underline the importance of multifaceted agricultural and rural development statistics for scientific and systematic policy formulation and synthesis and for understanding prevailing economic and social situation in farm sector.

In recent times, the food security and food supply vulnerabilities and livelihood concerns associated with farm sector have accentuated in different parts of the world. While addressing the agrarian issues from the perspective of demand and supply, resources, market and economic condition of farm households, it is also important to recognize the key role of farmers in attaining sustainable agricultural growth, as it is he who manages the farms and executes the agenda of enhancing resource use efficiency in the actual field conditions. The aggregated response to various institutionalised interventions in agriculture depends upon the differentiated entrepreneurship, spread over diverse social, economic, geographic and agro-climatic domains with varying endowments and their differentiated capacity and opportunity to adopt technology, access farm services and integrate production with market. The essentiality of focus on farmers and farm management in the framework of overall agricultural policy demands specific set of statistics. For the statistical systems, this policy paradigm poses further challenges since all the required data may not be available off the shelf.

The paper proposes to highlight the statistics on situation of farmers and farm management, experienced and outlined from the maiden nationwide ‘*Situation Assessment Survey (SAS) of Farmers*’ conducted by the National Sample Survey, (Jan – Dec 2003) and regular *Comprehensive Study of Cost of Cultivation*, in India and their policy inferences. These statistical dimensions are considered to be relevant to support the sustainable agricultural and rural development as well as to measure the well-being in the farm sector beyond income

Keywords: Farmer, Statistics, Agricultural development

1. Introduction

Agriculture is the activity of distinct economic as well as paramount social significance. With the importance for very existence of life and as the sole source of food and energy requirement of human life; agriculture connects with every human being on this planet. Being an economic activity primarily factored around natural endowments of land and water, efficient and conserved use of natural resources is the essence of sustainable agricultural growth. Such sustainable growth and development is integral to the quest for food and nutrition security.

On the front of sustainability and stability, agriculture is one of the more vulnerable sectors of the economy, often due to the complex combination of wide ranging factors, both intrinsic as well as extrinsic. Agriculture is one of the main stakeholders in the emerging experiences of climatic aberrations. The instances of climatic extremities are found to be more recurring and

impacting the production and supply, disturbing the market and price stability and causing social stress. Besides, the sector anchors the livelihood for millions of people pursuing the activity of agriculture or its peripheral activities, more or less universally adjunct to the rural economy.

There is inherent inseparability of agriculture from rural. The agriculturally dependent people are engaged in a sector structurally differentiated from the other sectors of economy. Accordingly, the Global Strategy to improve Agricultural and Rural Statistics (UNESC, FAO and World Bank 2010) and the endeavors of Wye City Group on Statistics on Rural Development and Agriculture Household Income, underlined the multifaceted importance of agricultural and rural statistics for scientific and systematic policy formulation and synthesis and for understanding prevailing economic and social situation in farm sector. The Strategy appropriately oriented its conceptual framework to policy centric three aspects of statistical outline, dovetailing with farm as an economic unit, the household as social unit and land as the natural endowment.

In the more integrated socio economic environment, cutting across the political frontiers and commensurate with the process of policy formulation, planning and management of the sector, the Strategy has identified in its first pillar, the core set of statistics and indicators on various aspects of the sector such as land and water use for crop as well as non crop purposes, crop acreage, production, productivity and corresponding trends, cropping pattern, number and size class of farm holdings, employment, consumption and corresponding demand supply analysis, price, market related statistics, farm and rural household income, expenditure on the sector, corresponding macro aggregates etc as the beginning point for improvement of agricultural and rural statistics.

In the contemporary environment, the need for sound data and information to comprehensively monitor the well being of people, policy and decision support and planning and overall management of agrarian economy has intensified. The Strategy acknowledged that the capabilities to generate systematically the layers of statistics and statistical indicators exist differentially in the countries. This primarily depends on their respective capacities of the statistical systems and the realized and prioritized needs and overall development perspective. While setting minimum core and baseline data set, the Strategy has also recognized that there will be newer and other relevant data and indicators needed to facilitate prime objective of balanced and sustainable agricultural growth and rural development, ensuring conservation of natural resources. This necessitates, essentially data relating to factors of production and the agents of its growth. These agents and activities in the sector are also the key players for efficient use of resources, their conservation and in-turn contribute to sustainability of agricultural growth. The papers delves into this dimension of data needs, contextually with the farmers and the farm management, the initiatives in generating such statistics in India and their potential in formulation and reorientation of policy.

2. Need for Statistics on Farmers and Farm Management

2.1 Perspective of sustainable development

The sustainable agricultural growth necessitates judicious use of resources, particularly the land and water in conjunction with the appropriate technology, aiming for efficient production and returns. Its development perspective extends to social and economic dimensions of the people engaged with production of agricultural produce and their relative status in the overall socio economic environment. The three specific domains of minimum set of agriculture and rural statistics, economic, social and environment, encompassing the stock of resources and capital (land, water, inputs, infrastructure and financial outlays for support and development), their use and application in different crops and commodities, output, value chain in the form of agro-processing, prices, income and corresponding household and demographic characteristics.

In this framework, an important agent for sustainable and stable growth is the one who takes decisions to grow particular crop out of the alternate choices, uses his skill and knowledge of appropriate agronomic practices and manages the resources, technology and inputs to produce. It is the farmer. Farmer is the anchor of sustainable agricultural and rural development and resource use efficiency. In the developing agrarian economies, large number of farmers are engaged in agriculture in the capacity of self employed and majority of farm enterprises are informal and own accounted. The statistics on their agriculture specific knowledge, capabilities, access to technology, social status and motivation for farming are of immense use for synthesizing the issues concerning sustainable agriculture.

2.2 Bridging rural data gaps

The discipline of agricultural statistics has matured to generate systematically an array of statistics and statistical indicators on various aspects of the sector. Such statistical exercises have been put in place in varying degree of planning and policy requirements. However, there still remain some crucial gaps in such statistical profile, that relating to socio economic conditions of farmer households, interfacing with his farming activities. There are surveys to generate statistics on the aspects of household economy in rural and urban segments, with some farming classifications of rural households, but these surveys are not primarily oriented to reveal the socio economic aspects of farmer households in relation to farming and also in relation to their counterparts in rural as well as urban segments.

2.3 Adding to understand well beings

It may be appreciated that there are structural rigidities associated with the farm sector and in the event of accelerated growth of overall economy, accentuation of disparities are apprehended. The domain of farmer households in itself is heterogeneous and their household economy is prone to be unstable. Be it climatic disturbance, stressed resources, sustainability, technological constraints, demographic pressures, shrinking sizes of farm enterprises or market aberrations, at the receiving end of their adverse affect on agriculture is invariably the farmer household. In case of developing countries, where the farm entrepreneurship and farm enterprises are largely informal, lacking risk aversion, with preponderance of small and marginal farm holdings, such vulnerabilities often breach the very subsistence and livelihood of farming communities. Hence the well being of the farmers, particularly, small and marginal ones, is

central to the farm sector policies along with the strategies for accelerating production growth and sustaining food security. In order to meaningfully address the farm sector issues and the well being of the farmer household, the statistical profile of socio economic conditions of the farmers is a developmental priority, particularly in the predominantly agrarian economies.

2.4 Policy input

The detailing in the form of farm management statistics such as inputs, employment, cost of cultivation, institutional interventions and trade are also necessitated to undertake calibrated and more informed policy exercise and decision making. Statistics on farmers and farm management are essentially the statistics on entrepreneurs and the enterprises engaged in agriculture. In the context of sustainable development of agriculture, these statistics ought to reflect on critical issues such as farmers inclination and involvement in the profession of farming, his access to technology, knowledge and various development programmes funded by the Government or other agencies, applied role of various factors of production in the farming, his relative socio economic status in the overall rural society. Besides, assessing the efficacy of farming and the use of resources, the measure of viability of farming business is also important for the sustainability of agriculture.

3. A Framework of Farmers Statistics: Situation Assessment Survey of Farmers (SAS)

The large scale sample survey, “Situation Assessment Survey of Farmers (SAS)”, conducted in India in the year 2003 by the National Sample Survey Office (NSSO), was one of the exclusive socio economic surveys aimed at bridging the data gaps and provides statistical indicators for formulating farmer oriented policy. Subsequently, the National Policy for Farmers (NPF) was announced by the government in 2007, addressing issues emerging from the SAS findings. These issues eventually were taken note of while evolving the strategies and programmes of agriculture and rural sector in the 11th Five Year Plan (2007-2012) on the paradigm of inclusive growth.

3.1 Accentuating farmers’ vulnerabilities

In the background of SAS, it is worthwhile to note that during the past five decades, the agriculture sector in India has been successful in keeping pace with the rising food demand of a growing population. The planning focus on accelerating food production with the induction of technology, interventions and institutional interlay and development of farming infrastructure paid dividends by ushering multifaceted farm sector revolutions. There had been, from time to time, adjustments in the program framework to expand the growth benefits over regions and crops. Specific focus on farming issues has all along remained an essential component of development agenda and farm related policies. However, in the decade of nineties, the agrarian stress and stagnation in farm economy was becoming evident. The momentum of agricultural growth was slacking and the farm sector growth was found to be not making meaningful change in the economic condition of farmers. Indian agriculture, with 140 million hectares net sown area, of which about 60% being rain-fed, with about 120 million operational holdings, the average size of operation holdings being 1.3 hectare and 80 % of holdings being small and

marginal ones (less than 2 hectares) was showing signs of various farm sector vulnerabilities. With the realization of accentuating distress in farm sector and the impact experienced by the domestic agriculture in the changing overall economic system in the emerging era of globalization and trade liberalization, a systematic and rational policy synthesis and analysis of farm sector was felt necessary.

3.2 Genesis of SAS

Coinciding with the dawn of new millennium, a comprehensive review of the farm economy was undertaken in three stages. Firstly, each component of the economy was systematically debated and studied by the professionals and experts under the mega project 'State of the Indian Farmer : A Millennium Study' sponsored by the Ministry of Agriculture, Govt. of India and these findings were documented in 27 volumes. At the second stage, the "Situation Assessment Survey of Farmers (SAS)", was conceived to generate the data base on socio economic condition of farmer households, their farming aspects and the interface with their household economy. As stated earlier, such data was necessary to bridge the data gaps in the existing statistical system for providing needed inputs for farmer oriented policy formulation. This national wide survey was entrusted to National Sample Survey Office (NSSO) by the Ministry of Agriculture. The policy analysis available through the 'State of the Indian Farmer : A Millennium Study' and the results of SAS were comprehensively looked into by a National Commission on Farmers, setup by the Ministry of Agriculture under the chairmanship of Prof. M. S. Swaminathan. This detailed exercise eventually culminated with the announcement of National Policy for Farmers (NFP) in 2007.

3.3 Logical framework of SAS

SAS was taken up for the first time in the NSS survey programme to generate baseline database on Indian farmers and to meet specific requirements of farm policy formulation. For the purpose of comprehensive assessment of the situation of farmers in the country, in several respects, SAS was a unique and distinct survey. The main focus of SAS is underlined as under:

- a. to assess the well-being of farmer households,
- b. to study the access of farmers to various resources,
- c. to judge the impact of technological change on Indian farming,
- d. to know the feelings of the farming communities on their profession of farming in different regions of the country, if they are satisfied or not with their profession.
- e. To capture information on awareness, access and response of the farmers to various institutional interventions and initiatives in vogue for the development of agriculture sector.

3.4 Design and derivatives of SAS

Statistics on such aspects had not been explored in the past. Thus, the designing of survey instruments for SAS required evolving concepts and definitions and integration of diverse aspects of household economy, farm economy, endowments, institutional access and perceptions

of farmers on farming etc. in a logical sequence. The salient features of its design, some important definitions, such as “farmers” and Farmer households” and outline of the schedule of enquiry (*NSS Schedule_33*²) are given in Annexure-1. Some of the important farmer centric information, that is not available from other sources and surveys and having significance for policy analysis are given below:

- a. *Awareness and perception on farming aspects*: general awareness/perceptions and other aspects of farming, Minimum Support Price, procurement agency, crop insurance, cooperatives services, source of seeds, replacement and varieties, membership with registered farmers organisation and self help group, awareness of World Trade Organisation (WTO) and liking farming profession.
- b. *Farming Resources and use*: particulars of land possessed and used, and irrigation, farming resources used for cultivation, use of energy during last 365 days, access to modern agricultural technology
- c. *Farmer Household Assets and Liabilities*: loans and other payable liabilities , type of security, period, source, purpose, purchase and sale of productive assets : Land , livestock and poultry, agricultural machinery and implements, for non-farm business
- d. *Economics of farming and non farm bussiness*: expenses and receipts for cultivation, farming of animals, non-farm business
- e. *Household level of living*: consumption and expenditure of food, clothing and footwear, education and medical (institutional) goods and services , miscellaneous goods and services including medical (non-institutional), rents and taxes, purchase and construction (including repair and maintenance) of durable goods for domestic use

3.5 Key Findings of SAS 2003

The results of the Situation Assessment Survey were brought out in five NSS reports:

Report No.495: Consumption Expenditure of Farmer Households

Report No.496: Some Aspects of Farming

Report No.497: Income, Expenditure and Productive Assets of Farmer Households

Report No.498: Indebtedness of Farmer Households

Report No.499: Access to Modern Technology for Farming

² The SAS Schedule 33, concepts and definition used in the survey, details of sample design and estimation procedure are given in the NSS Reports. These reports are freely downloadable on registration from the NSSO – MoSPI website: www.mospi.gov.in

Some of those findings of SAS, which are generally not available from the general system of agricultural statistics and had policy implications are summarized as under:

Aspects of Farming:

- a. One of the most disquieting facts emerged out of the findings of SAS, corroborating the very genesis of SAS was that **about 27% of farmers reported that they did not like the profession of farming because it was not profitable.**
- b. **In all, 40% of farmers felt that, given a choice, they would quit farming.**
- c. Rural societies, particularly in developing countries are isolated due to their sparse locations in hinterland. The connectivity and communication through various channels is therefore amongst the development strategies. Such connectivity stimulates the flow of knowledge and awareness of rural and farming communities. The SAS attempted to assess these aspects, in relation to farming. The propensity of participation and interface of farmer households with various institutional interventions is summarized in the Table 1 and the key aspects of farming inputs used by them are given in Table 2 below:

Table 1: Aspects of institutional engagements of farmers

Involvement / awareness of the Farmer Household	%
i. A member who belonged to a self-help group	5
ii. A member who belonged to a registered farmers' organization	2
iii. A member of a cooperative society	29
iv. Availed themselves of services from a cooperative (mostly either credit facilities, or services related to seeds or fertilisers)	19
v. Knowledge of bio-fertilisers	18
vi. Meaning of minimum support price	29
vii. Heard of World Trade Organisation	8
viii. Knowledge of Crop Insurance	57
ix. Crop Insured	4

Table 2: Aspects of input use and access of farmers

Involvement / awareness of the Farmer Households	%
i. Seeds purchased / farm-saved	48 / 47
ii. Seed replacement : annual / every alternate year	30 / 32
iii. Improved seeds used during kharif*/ Rabi* season	46/34
iv. Improved seeds availability within the village	18
v. Fertilisers used during kharif*/ Rabi* season	76/54
vi. Fertilisers availability within the village	27
vii. Organic manure used during kharif*/ rabi* season	56/38

viii.	Organic manure availability within the village kharif*/ rabi*	68 / 75
ix.	Pesticides availability within the village kharif*/ rabi*	46/31
x.	Use of Veterinary services kharif*/ rabi*	30/22
xi.	Availability of facilities for testing of fertilisers or pesticides	2

Source: NSS Report No.496: Aspects of Farming

Access to Modern Technology for Farming.

d. 'Access to Modern Technology for Farming' covered three aspects of access: access to source of information, effectiveness of the source in terms of adoption and subjective assessment of the source in terms of quality. The sources themselves can be divided according to (a) whether it is multi-purpose or specialised one and (b) whether it involves one-way or two-way interactions. Thus, Radio, TV and Newspaper are multi-purpose, one-way communication sources; Village fairs are two-way but multi-purpose sources; Participation in training, Krishi Vigyan Kendra, Government demonstration and Farmers' study tours again provide specialised two-way interactive sources while Extension worker and Para-technician/ private agency /NGO provide two-way, specialised and farmer-specific services. So are Input dealers, Other progressive farmers, Credit agencies, Primary cooperative societies and output buyers/food processors.

- At all-India level, 40% of farmer households accessed various sources of information for Modern Technology for Farming.
- Of the sixteen different sources canvassed for accessing information for Modern Technology for Farming, the most popular was 'other progressive farmers' with percentage of farmer households accessing information through the source as 16.7%, followed by input dealer (13.1%) and radio (13.0%).
- The two most popular sources, namely 'other progressive farmers' and 'input dealer' were contacted by the farmer households mainly on 'need basis' or 'seasonally'.
- Among the farmer households accessing information for cultivation from 'other progressive farmers', 40% received information on 'improved seed variety', 31% on 'fertiliser application', 15% on 'plant protection' and 14% on 'others'.

Income, Expenditure and Productive Assets of Farmer Households

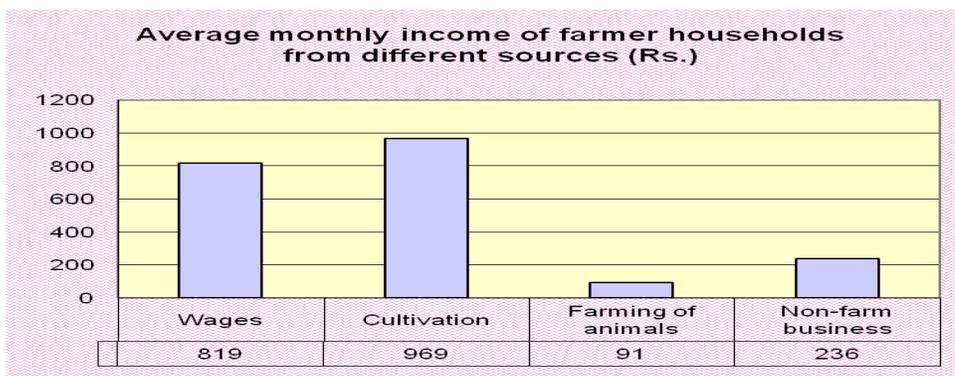
e. Income, expenditures and asset holdings amongst the farmers is expected to be heterogeneous over the regions and land size class of the farmers. Given that about 60 per cent of the rural households were farmer households engaged in farming activities like cultivation, plantation, animal husbandry, fishery, bee-keeping and other agricultural activities, these get manifested in to inter and intra rural disparities. SAS brought out the magnitude and dimensions of these disparities, some of which are summed below:

- Only 3 % farmer households owned tractors. Among large farmer households possessing 10 hectares or more land, there were 38 tractors per 100 households. For every 100 households with medium sized farm of 4-10 hectares, there were 18 tractors. For small farmers with land in the range of 0.4 –1.0 hectare, there was only one tractor per 100 households.
- Tribal farmer households possessed larger number of cattle heads compared to farmer households of other categories. There were 173 heads of cattle per 100 Tribal farmer households.
- Farmer households in the lowest monthly expenditure class or the poorest category had 31 buffaloes per 100 households, whereas the highest monthly expenditure class had 113 buffaloes per 100 households.

Breakup of farmer household income:

- f. Survey data on income are known to suffer from reporting biases and these seem to have affected at least some of the estimates, especially where very low and, sometimes, negative income estimates appear. However, one can have the idea of wage and non wage income of the households. According to SAS, the average monthly income of a farmer household (excl. rent, interest, dividend etc.) was estimated at Rs. 2115 of which major share accrued from from cultivation and wage earning. The non-farm business income was about 11% of total income (Figure-1).

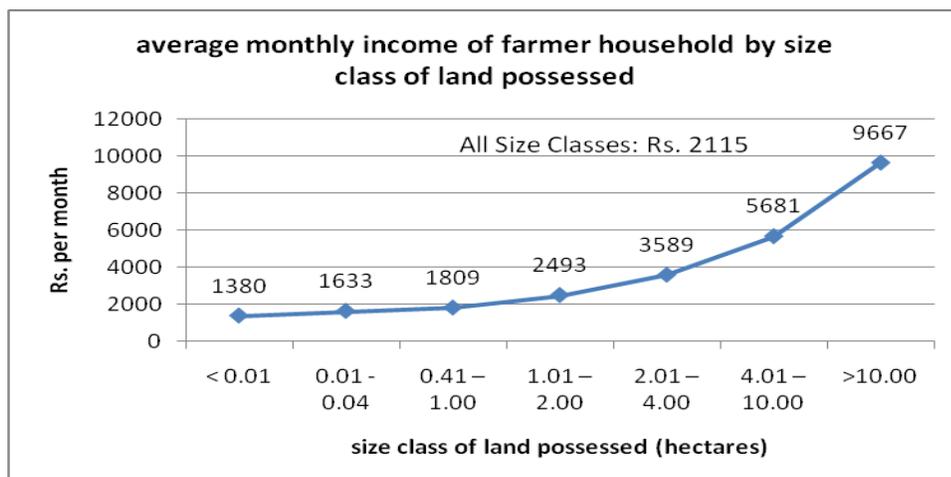
Figure-1: Average Monthly Income of the Farmer Households from different sources



Data Source: NSS Report No.497: Income, Expenditure and Productive Assets of Farmer Households

- g. Amongst the farmer households, the disparity in income is in consonance with the disparity in possession of land (Figure-2). The small operation holdings (land possession less than 1 hectares) are 62% of total holdings and farmers with small holding have average income less than the average income of all farmers (Rs. 2115 per month). Only one percent of farmers are having large holdings (more than 10 hectares) and their average monthly income was nearly five times that of overall average.

Figure 2 : Average monthly income from wages, farm business and non- farm business per farmer household by land possessed during the agricultural year 2002-03

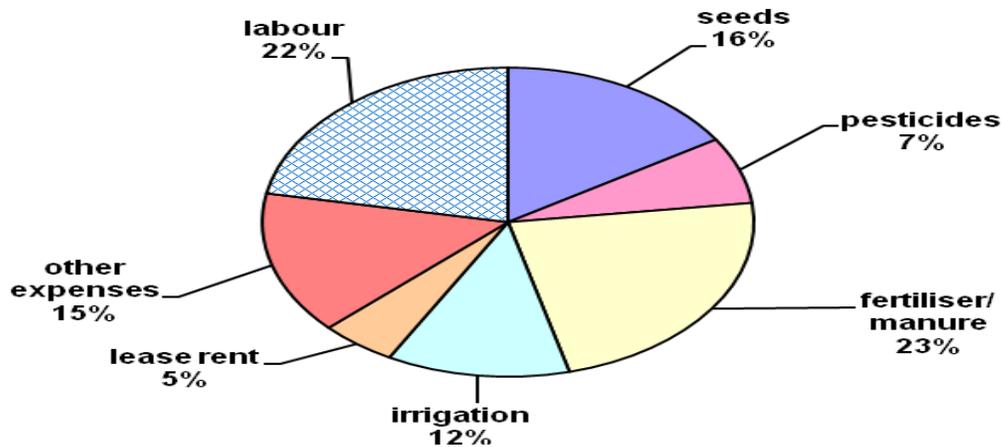


Data Source: NSS Report No.497: Income, Expenditure and Productive Assets of Farmer Households

- h. Breakup of average monthly expenditure incurred by farmer households in purchase and maintenance of productive assets,
 - 81 percent farm related assets,
 - 13 percent residential building and
 - 6 percent non-farm business.
- i. About 58 percent of the farmers kept some kind of farm animals. Households engaged in dairying spent on an average Rs.814 per month on dairy farming. Farmer households who kept poultry spent on an average Rs.129 per month on poultry farming.
- j. The break-up of the total annual cultivation expenses showed that 23 percent of the expenditure went for fertilizers and manure, 22 percent towards labour charges, 16 percent for seeds and 12 percent for irrigation (Figure 3).

Figure 3: Expenses on cultivation by farmer households

Expenses on cultivation in rural India



Data Source: NSS Report No.497: Income, Expenditure and Productive Assets of Farmer Households

Indebtedness of Farmer Households

- k. The findings of indebtedness of farmer households were very important for addressing the prevailing perception of rural distress, particularly due to agrarian issues. The SAS found that 43.4 million out of 89.35 million farmer households (48.6%) were reported to be indebted. In the sub national context, prevalence of indebtedness among farmer households was highest in Andhra Pradesh (82.0%), followed by Tamil Nadu (74.5%) and Punjab (65.4%).
- l. However, the prevalence of indebtedness was less in case of marginal farmers. Households with land possessed 1 hectare or less accounted for 66% of all farmer households. About 45% of them were indebted. Households with 4 hectare or more land possessed accounted for 8% of all farmer households. About 65% of them were indebted.
- m. More than 31% of loans outstanding was towards capital expenditure and 29 % towards current expenditure in farm business. or current expenditure in farm business.
- n. The most important source of loan in terms of percentage of outstanding loan amount was banks (36%), followed by moneylenders (26%). However, the access of credit from money lenders / non institutional financiers was relatively higher in case of small and marginal farmers. The flow of institutional credit, on the other hand was more for medium and large farmers.

Level of Living of Farmer Households

- o. The NSSO is the prime data source for the level of living indicators in India, generated through the household consumer expenditure (HCE) surveys regularly conducted by it. The quinquennial HCE forms the basis for poverty estimation and it has comprehensive

HCE schedule 1.0 with detailed breakup of commodities and services consumed by the household. However, in several socio economic enquiries such as SAS, the HCE as the classificatory characteristic is measured through the abridged worksheets. The main parameter estimated through HCE is monthly per capita consumer expenditure (MPCE). According to the latest quinquennial HCE surveys (NSS 66th Rd., 2009-10), **there is already substantial divergence between the rural and urban MPCE and the former is about 40% lower than the later.** This divergence has been persisting over the years.

- p. The SAS revealed that within the rural sector, the level of living of farmer households measured in terms of average MPCE in the country during the year 2003 was lower than the all rural households by 9.3%. Compared to all rural households, the farmer household consumption is lower in most of the consumption groups (market based goods and services) except in case of cereals and cereals substitutes and milk and milk products, which are often their own production. The expenditure on food items by the farmer households (including consumption from own produce) was lower by 7% than all rural households, for non food items, that relate to aspects of quality of life such as education, medical, durable goods and services, this difference was about 12%. Thus **the level of living and the quality of life of farmer household was much lower than the other households.**
- q. The results of SAS can be juxtaposed with other studies of rural societies for better understanding of differential in levels of living. From the point of view of land marginalization in farming communities, Kerala has lowest average land holding size, yet it has highest average MPCE. It had also been observed that Kerala has highest propensity of rural economic diversification (Mehta 2009) and amongst the lowest rural poverty. **Thus the farming communities are heterogeneous, not only on account of their farming endowments but also on other socio economic factors.**

4. Statistics on Farm Management

If farming is a profession and farm is a business enterprise, it is imperative that the management of farms would cover the aspects of decision making on choice of produce, use of resources and agronomic practices for production with a view to continued profit. The continued profit from the activity of agriculture is one of the essences of its sustainability. This process of decision making is dynamic, keeping itself abreast with changing technology, resource availability and market situations. However, the connotation of farming as a business with the primary motif of continued profit may not be generalized. For a large fraternity of small and marginal farmers, farming is the means of livelihood, subsistence and socio-economic sustenance. Can the data on farmers and farm management also help to decipher such differentiation in the farming domain? If so, what strategies to be evolved to inculcate farming entrepreneurship to enhance sustainable growth? Thus the objective analysis of multifaceted issues associated with farm economy requires disaggregated as well as aggregated information with suitable and appropriate indicators on farmers and farm management.

Measurement of farm management aspects is a complex endeavor. As seen in case of the situation assessment of farmers, the assessment unit was farmer household. However, the observation unit for studying the aspects of farm management may not be same as that the one used for statistics on farmers. Some information on farm management can as well be collected household survey approach. But for farm management studies, entrepreneurial unit such as farm or the operational holding is more appropriate. The complexities in such data collection are compounded by the very nature of farming which is spread over time from sowing to harvesting, marketing and consumption. This temporal spread also varies from crop to crop and region to region and, the factors of production such as labour and material are used in differentiated combinations for the crops and over the regions.

The farm management studies have been undertaken in many countries with primary focus on arriving at cost of cultivation and cost of production. There have been initiatives under the aegis of FAO to harmonize the concepts and methodologies for such studies for better comparability. The surveys to estimate cost of production, designed to collect information about costs incurred on material and labour at different stages of production, is identified as one of the important sources of data in evolving the System of Accounts for Food and Agriculture (SEAFA: FAO).

4.1 Indian Perspective:

The importance of farm management studies in the framework of agriculture and food management policies in India was realized way back in 1950s. It was institutionalized as a regular survey programme with the initiation of Comprehensive scheme for Study of Cost of Cultivation (CSS) in 1971 to provide detailed data on farm management, particularly on cost of cultivation (cost per hectare) and cost of production (cost per ton) in respect of 28 crops. Salient features of this scheme, its design and costing concepts are annexed at Annexure-2.

Since the agricultural produce markets are inherently unstable and tend to turn into buyers market in the season of crop maturity, in order to safeguard the interest of the farmers and protect their income, peak season market intervention is an integral part of agricultural policy in India. The data on cost of production generated from CSS is crucial input in formulation of Minimum Support Prices that are announced by the Government for specified crop, well in advance before the season of the crop. This exercise attempts to take in to account the heterogeneous practices and resource use efficiency in crop production in the vast agrarian domain.

4.2 Some issues on Costing:

The cost of cultivation per unit area is the lead indicator to synthesize the farm management. There are peculiarities associated in farming practices that have bearing on its sustainability. In many developing countries, agricultural activities are unorganized and self employing. Thus the substantial part human of labour input in farming is the unpaid family labour. Similarly the farming assets in the form of land and farm machinery are also largely self owned and no

expenditure on account of rent etc is made by the farmer. The costing structure therefore is evolved in taking into following broad considerations.

- a. Total cost takes into account the paid out cost by the farm enterprise (termed as cost A2)
- b. Implied cost of cultivation (termed as cost C2) where the cost of unpaid family labour and rent on family assets is included in using laid down norms of imputation such as prevailing labour charges on minimum wage rates.
- c. Gross return (GR) to include the value of produce realized from sale, including the value of produce retained for self consumption and the value of by products.

4.3 An analysis of farm management

The important indicator to compare the performance of farm enterprises, besides the productivity / yield per unit area, is the cost benefit ratio (CBR), which is the ratio of GR per hectare and total cost. Ideally, the farming will not be viable if CBR is less than one. The analysis of CBR reveals the intra crop comparison over the regions. The comparison of CBR over the crops of same season, in conjunction with gross margin (CR – total cost) providing an insight into choice of farmers to decide for alternative crops and the trend of CBR over time reflecting the sustainability of agriculture with continuing business viability.

Paddy is a widely grown crop in Indian sub continent. The CBR corresponding to cost A2 and C2 in respect of 15 major states for the year 2008-09 (a normal production year) reveal inter regional variation (Table-3 and Figure-4). However, a noticeable and distinct feature in respect of Eastern India is less than one implicit CBR (at cost C2). On commercial terms, paddy cultivation appears to be non viable proposition in this region. Yet the paddy occupies major share in total cropped area in this region. Then the question comes that what was the sustainability of paddy cultivation? Answer possibly lies that the cultivation is viable in terms of CBR at cost A2 and farmers are able to cultivate the crop at some margin for their subsistence.

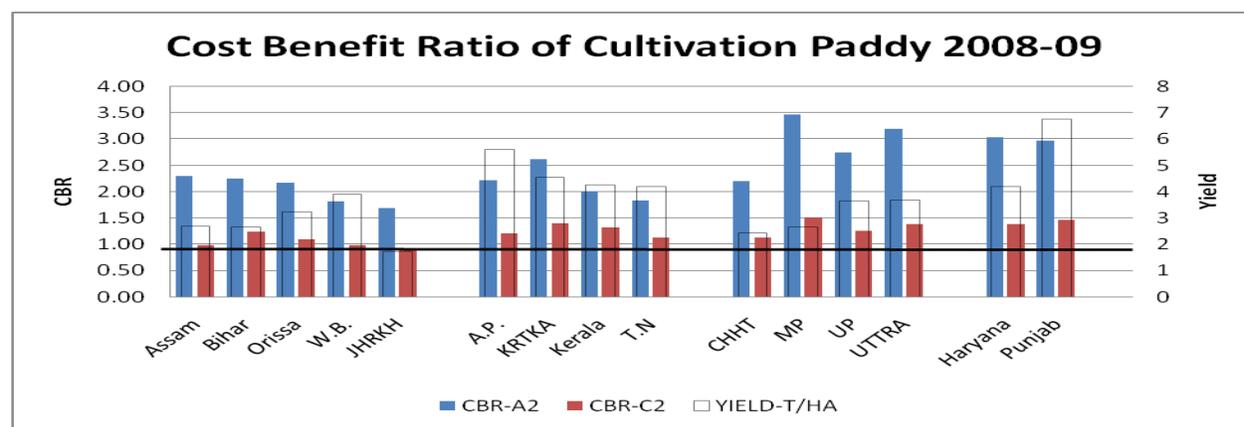
Table 3: Inter regional comparison of Cost Benefit Ratio of Paddy (2008-09)

Region / States	Cost Benefit ratio on Cost A2	Cost Benefit ratio on Cost C2	Derived Yield (Tns./HA)
(1)	(2)	(3)	(4)
Eastern India			
Assam	2.31	0.99	2.7
Bihar	2.26	1.24	2.7
Orissa	2.17	1.10	3.2
West Bengal	1.83	0.99	3.9
Jharkhand	1.69	0.92	1.7
Southern India			
Andhra Pradesh	2.23	1.21	5.6
Karnataka	2.63	1.40	4.5

Kerala	2.01	1.33	4.3
Tamil Nadu	1.84	1.14	4.2
Central India			
Chhatisgarh	2.20	1.13	2.4
Madhya Pradesh	3.48	1.52	2.7
Uttar Pradesh	2.75	1.26	3.7
Uttarakhand	3.19	1.39	3.7
North West India			
Haryana	3.04	1.39	4.2
Punjab	2.98	1.48	6.7

Source: Author's computation

Figure-4: Inter regional comparison of Cost Benefit Ratio of Paddy (2008-09)



In contrast to Eastern India, the states in North West and Central India produce rice with commercial consideration. This is corroborated by healthy CBR on Cost C2. Higher CBR is indicator of business viability. It may also be interesting to look into the relation of CBR with production growth. In case of paddy, it was found that the CBR – A2 and productivity is almost having no correlation (Table-4 –correlation coefficient less than 0.25). Contrarily this correlation was noticed to be fairly high (correlation coefficient more than 0.75) in case of wheat and rapeseed and mustard implying that higher yield leading to higher viability of farming business. These differentiations in relationship between CBR and productivity reflect varied dimensions of economic and social sustainability of agriculture.

Table-4: Correlation between CBR and Yield

Crop	Correlation Coefficient		
	CBR-A2 & CBR-C2	CBR-A2 & Yield	CBR-C2 & Yield
Paddy	0.83	0.22	0.64
Wheat	0.93	0.75	0.79
Rapeseed & Mustard	0.93	0.93	0.80

Source: Author's computation

There emerged an interesting convergence on entrepreneurship of farmers reflected by SAS and the viability of farm enterprises, revealed by CBR. In SAS, the revelation was that about 27% farmers did not like their profession. In the states, where CBR-C2 was found to be less than 1, this dislike for the farming profession was about 35%. Further, the states with less than 1 implicit CBR have relatively lower value of marketable surplus, which is also estimable from the CSS. This phenomenon is evident for various food crops but less for non food crops that are mainly grown with high marketing surplus.

5. Policy Derivatives

The endeavor to generate statistics and indicators on farmers provide insight into various socio-economic aspects of farm sector, involving farmer households. One of the main goals of farm sector policies is to ensure sustainability of food security, keeping pace with the growing population and their consumption dynamics. For this, besides resource and endowment management, technological support and institutional delivery system, paramount is the entrepreneurship of farming communities. The disorientation of farming community towards their profession, as reflected by SAS that 40% of them inclined to switchover their profession, given a choice and 27% not liking the profession as it was not profitable, was a matter of concern for strategic framework the for development and growth of agricultural sector.

The aspects of farming and access to technology are the areas having direct bearing on production gains expected from the sector. The ground realities on use of inputs such as seeds and its replacement by farmers, their less promising interaction and engagement with institutions including NGOs and resultant continued slackness in their economic condition, and prevalence of indebtedness in farming communities corroborated the reported distress in their domain.

In this background of “*wakeup call*”, as termed by the National Commission on Farmers, a new paradigm was evolved in the farm sector policy formulation in India. Hitherto, the policy and programmes were oriented to sectoral growth, production, productivity, resource augmentation and backward and forward linkages with focus on food security. The National Policy for Farmers (NPF), announced by the Government of India in 2007 gave the farm sector policy formulation a distinct dimension, keeping wellbeing of farmers as one of its central theme. On the need for such reorientation, the policy stated “*there is a need to focus more on the economic well-being of the farmers, rather than just on production. Socio-economic well-being must be a prime consideration of agricultural policy, besides production and growth. The aim of the Policy is, therefore, to stimulate attitudes and actions which should result in assessing agricultural progress in terms of improvement in the income of farm families, not only to meet their consumption requirements but also to enhance their capacity to invest in farm related activities.*”

In consonance with the goals in the NPF, the focus of 11th Five Year Plan (2007-12) is for achieving accelerated, broad based and inclusive growth, aiming to faster reduction in poverty and helping to bridge the divide in the economic conditions amongst different segments of population. Towards this end, several initiatives have been taken to have broad based

sustainable growth in agriculture. The initiatives such as a National Agricultural Development Plan (Rashtriya Krishi Vikas Yojana – RKVY), National Food Security Mission, National Rural Employment Guarantee Scheme (NREGS), National Horticulture Mission, Rural Health Mission, Skill Development etc. are aimed at multidimensional agricultural and rural social development. The emphasis on seed replacement and seed treatment has shown encouraging production response. Institutional role in the areas has been revamped and their delivery has been simplified. The marketing and price mechanism has been strengthened for ensuring better returns to the farmers.

Statistics on farm management enables to measure the impacts of policy modulation and greater resource mobilization. The thrust given to strengthen food security resulted into higher farm output of paddy and wheat and this growth was also reflected in improved farm profitability with the increase in CBR of paddy and wheat in 2008-09 compared to 2003-04. But there is also an interesting revelation on behavior of farm profitability. Wheat and rapeseed and mustard are competing crops of the season. In the corresponding period, farm profitability of wheat had shown increase across the region, the same, in terms of CBR, had declined in case of rapeseed and mustard. Such differentiated trend of farm profitability suggests the possible change in farmer's choice for growing the crop and resultant affect on the supply of these commodities.

6. Conclusions

The Comprehensive Scheme of Cost of Cultivation is already integrated with the agricultural price policy. The relevance of statistics on farmers in providing useful input for farm policy formulation has also been acknowledged and its integration with the programme of National Sample Survey to have such data at decadal interval is planned. Thus, both the statistics on farmers and farm management are becoming integral part of system of agricultural statistics to support policies and decision making for agriculture and rural development in India. Both these statistics are complimentary to each other in assessing the extent and prevalence of weakness amongst the farmer and their households in accessing technology, institutional delivery, adopting appropriate agronomic practices and their relative status of economic conditions. All these assessed factors have implication on production efficiency, farm profitability and economic viability of farming enterprises. These statistics diagnose the health of agriculture sector and facilitate the modulation in policy and programme prescription for sustainable development of agriculture and resultant improvement in the well being of farming communities.

The relevance and importance of statistics on farmers and farm management for decision support and management of agriculture sector may vary from country to country. However, in the context of developing agrarian economics, particularly with large and diverse population dependent on agriculture and dominance of informal and unorganized entrepreneurship, it is expected to have special significance. This postulation is made on the premise that in such economies, the rural urban divide is expected to be starker, within the rural domain, the economic condition of farmers household is expected to be weaker and access to technology, institutional support and market is expected to be lagging for the large sections within farmer households.

In the context of sustainability of agricultural development, another pertinent question arises that when the farmers keep pace with the process of human development and improve their skill for alternative professions, will they like to pursue the profession of farming? The disinclination of farmers to pursue their profession and to seek alternative work, however, will be subject to the potential of non farm sector to absorb them. The studies have shown that the type of non- farm employment and enterprises in rural economy are often linked to farm activities (Bhalla 2003)³. Thus development of farm production, both in terms of volume and profitability is stimulant in increasing rural income, both from rural farm as well as non-farm activities. The farm sector profitability is also important to improve professional inclination of farmers in farming. These issues invite attention for sustainable agricultural development and efficient use of resources for profitable farm enterprises, necessitating professional zeal, inclination and motivation of farmers.

The statistics of farmers and farm management thus become relevant for addressing the development issues, in the spirit of the exploration of potential use of improved and newer statistics as policy related indicators and of farm and rural households, national resources and regional economic development, enshrined in the mandate of Wye City Group. The strategy as well as recently unveiled action plan for its implement (FAO 2011) also envisages strengthening capabilities of countries to generate statistics relating to farm sector and rural areas and their enhanced use by decision makers. The empirical analysis on statistics on farmers and farm management and its use in decision making and governance to strengthen sustainable agriculture contributes towards furthering the agenda of Wye City Group and implementation of the Strategy.

References

Bhalla, Sheila (2003) *The Restructuring of the Unorganised Sector In India*, Report submitted to the Planning Commission, Government of India.

FAO (1996), *A system of economic accounts for food and agriculture*, Food and Agriculture Organization of the United Nations,

FAO (2011), “ *Improving Statistics for Food Security, Sustainable Agriculture, and Rural Development* , *Global Action Plan*, Food and Agriculture Organization of the United Nations, July 2011

Government of India (2005) *Situation Assessment Survey of Farmers - Consumption Expenditure of Farmer Households* , NSS report 495 National Sample Survey Office, National Statistical Organisation, Ministry of Statistics and Program Implementation, New Delhi.

³ Most of the demand for the goods and services provided by these non-farm business units in rural areas was clearly coming from local households mainly dependent on agricultural incomes. This is why an all India study, based on NSS data, found that regional variations in farm labour productivity are closely related to regional levels of labour productivity in rural non-farm enterprises. In regions where agricultural labour productivity is high, labour productivity in the non-farm sector is also high.

Government of India (2005) *Situation Assessment Survey of Farmers - Some Aspects of Farming*, NSS report 496 National Sample Survey Office, National Statistical Organisation, Ministry of Statistics and Program Implementation, New Delhi.

Government of India (2005) *Situation Assessment Survey of Farmers - Income, Expenditure and Productive Assets of Farmer Households*, NSS report 497 National Sample Survey Office, National Statistical Organisation, Ministry of Statistics and Program Implementation, New Delhi.

Government of India (2005) *Situation Assessment Survey of Farmers - Indebtedness of Farmer Households*, NSS report 498 National Sample Survey Office, National Statistical Organisation, Ministry of Statistics and Program Implementation, New Delhi.

Government of India (2005) *Situation Assessment Survey of Farmers - Access to Modern Technology for Farming*, NSS report 499 National Sample Survey Office, National Statistical Organisation, Ministry of Statistics and Program Implementation, New Delhi

Government of India (2007) *Serving Farmers and Saving Farming- Towards Faster and More Inclusive Growth of Farmers' Welfare*, Reports of the National Commission on Farmers, Ministry of Agriculture, Govt. of India

Government of India (2007), *National Policy for Farmers*, Ministry of Agriculture, Govt. of India

Government of India (2008), *11th Five Year Plan (2007-12)*, Planning Commission

Government of India (2008) “*Manual on Cost of Cultivation Surveys*” National Statistical Organisation, Ministry of Statistics and Program Implementation, New Delhi

Government of India (2010) ‘*Agricultural Statistics at a Glance*’, Directorate of Economic and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India.

Mehta Rajiv (2009) *Rural Livelihood Diversification and its Measurement Issues: Focus India* Wye City Group on Rural Statistics and Agricultural Household Income, Second Meeting, 11-12 June 2009, FAO, Rome.

UNESC, FAO and World Bank (2010), “*Global Strategy to Improve Agricultural and Rural Statistics, Report of the Friends of the Chair on Agricultural Statistics,*” Economic and Social Council Statistical Commission ,

United Nations (2007), *The Wye Group Handbook 'Rural Households Livelihood and Well-Being'*

Annexure-1

Salient Features of ‘Situation Assessment Survey of Farmers’(SAS)

This survey was carried out by the NSSO during January to December, 2003 as part of its 59th round to assess the well-being of farmer households, study their access to various resources, and judge the impact of technological change on Indian farming for meet the specific requirement of policy review. NSS 59th Round was a multi subject survey earmarked for the periodic subject coverage of household land and livestock holdings and all India debt and investment’ survey (AIDIS). The SAS was integrated with the sample design of 59th round and was carried out only in the rural sample since the agricultural activity is pre-dominantly a rural phenomenon and the diversity of farming activities as well as farmers’ situations is more pronounced the rural areas.

Survey and reference period: The NSS 59th round survey period was 1st January 2003 to 31st December 2003 and data was collected relating to the fixed reference period of the agricultural year July 2002 – June 2003. In order to reduce the recall error, the total information relating to each sample household was programmed to be collected in two visits. The first visit (January to August) broadly covered the Kharif season of the agricultural year 2002 – 2003 and the second (September to December) the corresponding Rabi season. Further, the survey period of the round was divided into two sub-rounds. Sub-round one consisted of the first half of the survey period of each visit while sub-round two consisted of the remaining period.

Sample design and sample size: The sampling design of 59th round was the usual multistage stratified one, generally adopted in case of NSS demographic based surveys. Sampling frame for First Stage Units (FSU) for the rural areas was the list of villages (panchayat wards for Kerala) as per Population Census 1991. Districts were the strata for rural sample and in all 6848 villages were allocated to the FSU stratum in PPS to strata population. The rural FSU sampling also adopted the special sub stratification to enable representation of extreme small as well as large villages. In each selected FSU, sample of 8 *farmer* households, i.e., the second stage units (SSU) were selected for canvassing the SAS schedule 33, following 4 second stage stratification (SSS) to provide size class of land possessed.

The listing schedules (sch 0.0) was canvassed only in the first visit in the selected villages (first stage unit) and this provided the frame of SSUs. Specially designed SAS schedule - 33 was canvassed in independent sets of sample households. Identification of farmer household during listing as the SSU was one of the distinct feature of the survey. For this purpose, the terms “*farmers*” and “*Farmer Household*” were defined for the purpose of SAS.

Definition of Farmer and Farmer Household in SAS: A **farmer** was defined for SAS survey as a person who operated some land (owned or taken on lease or otherwise possessed) and is engaged in agricultural activities in broad sense of the term e.g. cultivation of field crops, horticultural crops, plantation, animal husbandry, poultry, fishery, piggery, bee-keeping, vermiculture, sericulture, etc., on that land during last 365 days. Those engaged in agricultural and allied activities but did not operate a piece of land were not classified as farmer. Thus agricultural

labourer, coastal fisherman, rural artisans and persons engaged in agricultural services did not qualify as farmer.

The purpose of SAS was to probe into the activities and conditions of the farmers. Therefore, if during the reference period of last 365 days, a person had left his entire land as 'current fallow' by discretion or due to natural conditions, he was not qualified as farmer, since no meaningful information could be obtained in from such farmers who have kept their entire land as 'current fallow' during the reference period, such farmers were excluded from the coverage of the present SAS. This was a deliberate departure from conventional agricultural concepts followed generally in agricultural census. Thus, for a person to be considered as a farmer in SAS, he would have possessed some land and had engaged in agricultural activities on that land during the reference period. Further, agricultural activities of insignificant nature or agricultural activities done at a nominal scale were also not treated as agricultural activity for the purpose of this survey.

Farmer Households were those households with any its member was a farmer. This was also termed as households with farming activity. Farm business consisted of cultivation including orchards and plantation, and farming of animals such as dairy, rearing of sheep and goats, piggery, poultry, duckery, fishery, beekeeping

The SAS questionnaire (Schedule 33) was specially structured and had 24 blocks with schematic grouping in the broad subjects covered.

In all, 51,770 *farmer* households spread over 6,638 villages were sample surveyed.

Annexure-2

Salient features of Comprehensive scheme for Study of Cost of Cultivation (CCS)

The Comprehensive scheme for Study of Cost of Cultivation (CCS) is the regular survey programme providing detailed data on farm management, particularly on cost of cultivation and cost of production. This scheme was initiated in 1971 and is administered by the Directorate of Economics and Statistics, Ministry of Agriculture. The Survey operations under the scheme cover 19 states and are implemented mainly through Agricultural / general universities. The sampling methodology is three stages stratified random sampling and each state is divided in homogenous agro climatic zone. Primary sampling unit is sub District (Tehsil) allocated to different zones, Second stage unit is village / cluster of villages and final stage units are operational Holding selected at random from each land size class. The sample size of the scheme is 840 Tehsils (sub district) of 8400 final sampled units. These operational holdings are further stratified in five size classes to provide representation to marginal, small and large holdings.

System of Data collection: The CCS follows the cost accounting method and adopts the crop complex approach. Under this approach, data on inputs and outputs in physical and monetary terms are collected in respect of all the crops cultivated in the sampled operational holding. Presently, there are 28 crops for which estimates of cost of cultivation and production are generated (details of crops are given in Annexure-2). The survey provides daily entries of debit/credit for expenditure/become mode to assess total cost/benefit. For processing of data, Farm Analysis Package (FARMAP) developed by FAO in 1992 is used.

Crop Coverage

Total Crops Covered for 2008-2011 - 28	
Crop Group/ No. of crops	
Cereals (7)	Paddy, Jowar, Bajra, Maize, Wheat, Ragi and Barley
Pulses (6)	Bengal Gram, Arhar (Red Gram), Moong (Green Gram), Urad (Black Gram), Peas and Masur (Lentil)
Oilseeds (7)	Groundnut, Rapeseed and Mustard, Soyabean, Sunflower, Safflower, Sesamum and Nigerseed
Fibers (2)	Cotton and Jute
Sugar (cane) (1)	Sugarcane
Fruits and Vegetables (3)	Onion, Potato and coconut
Miscellaneous (2)	VFC Tobacco, Black Pepper

Cost Frame

The items of cost of cultivation cover both the paid-out costs (out-of-pocket expenses) and the imputed costs. The items covered under these costs are:

- a. Paid-out Costs
 - i. Hired labour (human, animal and machinery).
 - ii. Maintenance expenses on owned animals and machinery.

- iii. Expenses on material inputs such as seed (home grown and purchased), fertilizer, manure (owned and purchased), pesticides and irrigation.
- iv. Depreciation on implements and farm buildings (such as cattle sheds, machine sheds, storage sheds). Land revenue.
- v. Rent paid for leased- in land.
- vi. Misc. Expenses

b. Imputed Costs

- i. Value of family labour,
- ii. managerial input of family,
- iii. rent of owned land and
- iv. interest on owned fixed capital, for which the farmer does not incur any cash expenses.

Cost Concepts

Costs are generated following certain cost concepts. These cost concepts and the items of costs included under each concept are given below:

Cost A1 : All paid out cost on labour and inputs, purchased / hired

Cost A2: Cost A1 + rent paid for leased in land.

Cost B1: Cost A1 + interest on value of owned fixed capital assets (excluding land).

Cost B2: Cost B1+ rental value of owned land (net of land revenue) and rent paid for leased-in land.

Cost C1: Cost B1 + imputed value of family labour.

Cost C2: Cost B2 + imputed value of family labour.

Cost C2*: COST C2 adjusted to take into account valuation of human labour at market rate or statutory minimum wage rate whichever is higher.

Cost C3: Cost C2* + value of management input at 10 percent of total cost (C2*).

Improving Statistics for Food Security, Sustainable Agriculture, and Rural Development ,
Global Action Plan, UN FAO, July 2011