



Food and Agriculture
Organization of the
United Nations

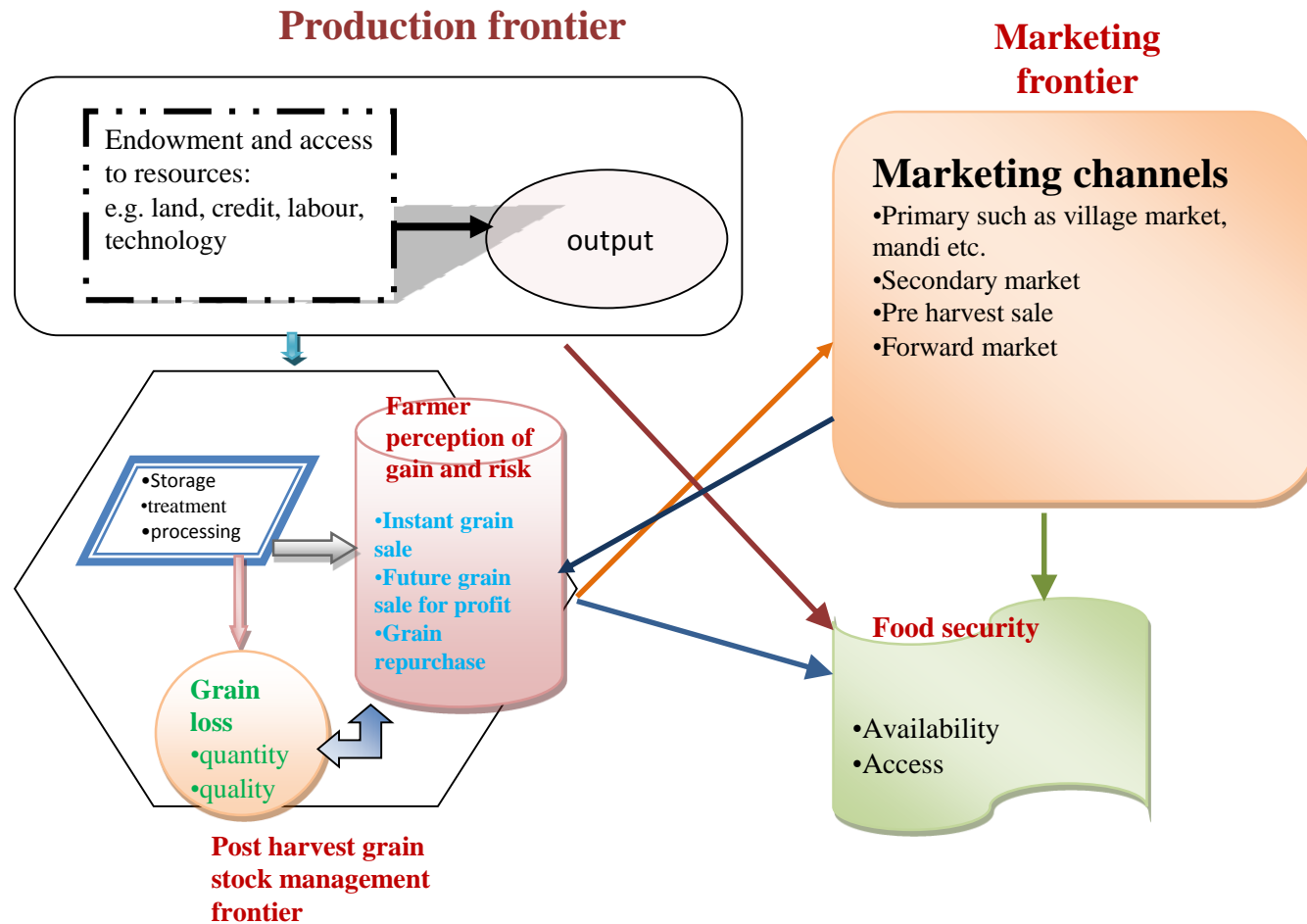
**International Seminar on Approaches and Methodologies for
Private Food Grain Stock Measurement**
New Delhi, 9-11 November 2016

Estimation of Private Food Grain Stock
Methodology for Assessing Private Food Grain Stock

Technical Session 4:

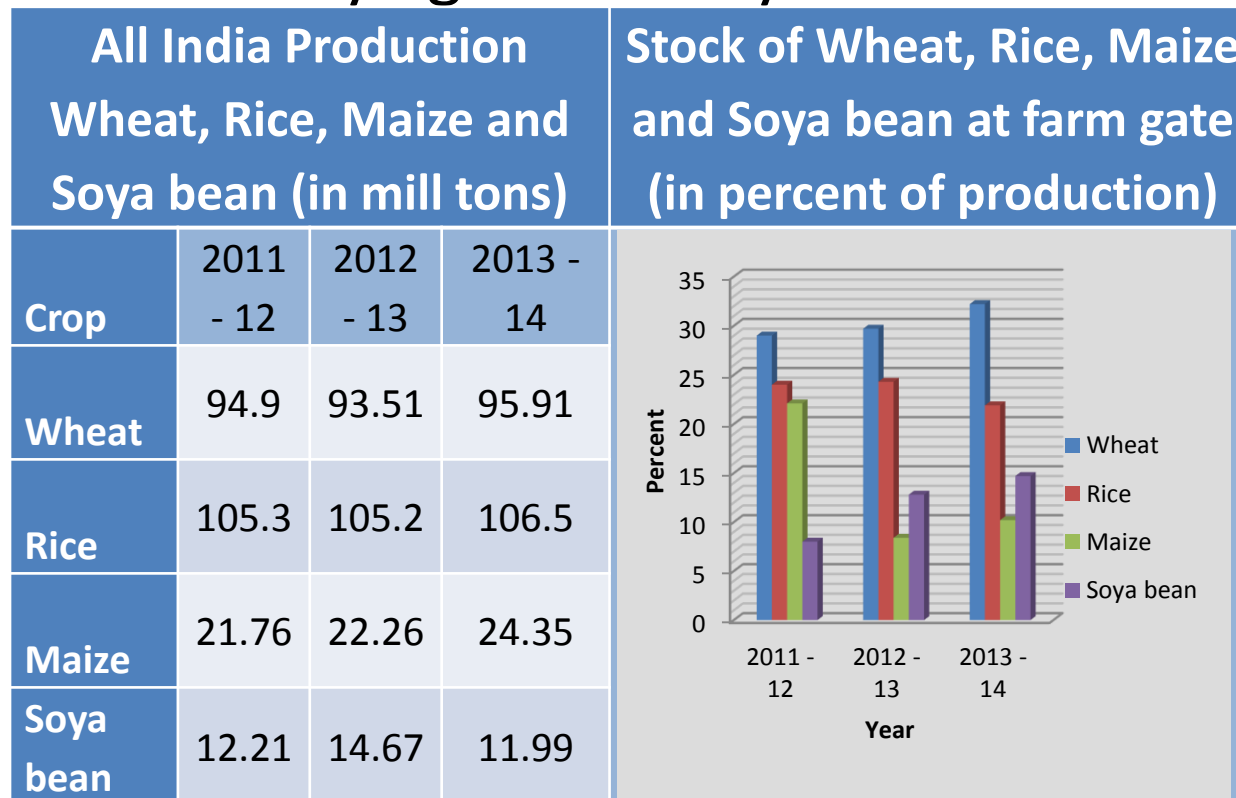
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Framework of Agricultural Operations and Private Stock Accumulation at the farm gate



Private Food stock at farm gate

Data from Cost of cultivation survey (CSS) (RT-610) shows that Farmer hold significant amount of stock at the end of any agricultural year



Present Status of stock estimation and availability of relevant data

- RT 610* collects data on receipt and disposal including 'opening stock, 'closing stock'.
- It also collects few information on farmer's practices.
- However, does not estimate any private farm gate stock.

* RT 610 is one of the schedules of Cost of cultivation study data plan

The reasons.....

Present Status of stock estimation and availability of relevant data in CCS

- CCS focus is on estimation of cost of cultivation
 - not on stock estimation
- Small sample
- Sampling design and crop complex approach
 - Mainly captures principal crops
 - does not necessarily ensure crops with less cultivable area (data on soya bean is of concern) – call it “minor” crops
- Data quality issue

Present Status of stock estimation and availability of relevant data

- Present sampling design-multistage stratified
- In target States

Strata

- States are divided into homogeneous zones

First stage selection

- Tehsils (sub division) are selected using PPSWOR; size being area under selected crop
- One village selected using PPSWOR; size being area under selected crop

Second stage selection

- All farm holdings of the selected village listed and classified in to five size classes.
- two operational holdings are selected from each size classes using simple random sampling.

Nodes of Food Grain stock Accumulation

- Farming Households
- Institutional farms
- Non-farming households
- Institutions (hotel/restaurants etc)
- Millers and Processors
- Wholesalers and Retailers

(including Exporters and Importers)

1. **The Non-farming is excluded from the study as non-farming Household keep stock for consumption. If household use stock for commercial purpose it becomes an enterprise-captured in the proposed survey.**
2. **Government Procurement and Stock Excluded**

Domains of Private Food Grain Stocks

covered by Indian Statistical System

ON FARM

OFF FARM

Farm Gate Stock

Cost of
Cultivation
Survey

Annual Survey
of Industries

Big gap

Large Processors & Millers

Large Wholesalers & Retailers

Large Hotels and Restaurants

8

Small Processors & Millers

Enterprise survey
for unorganised
sector

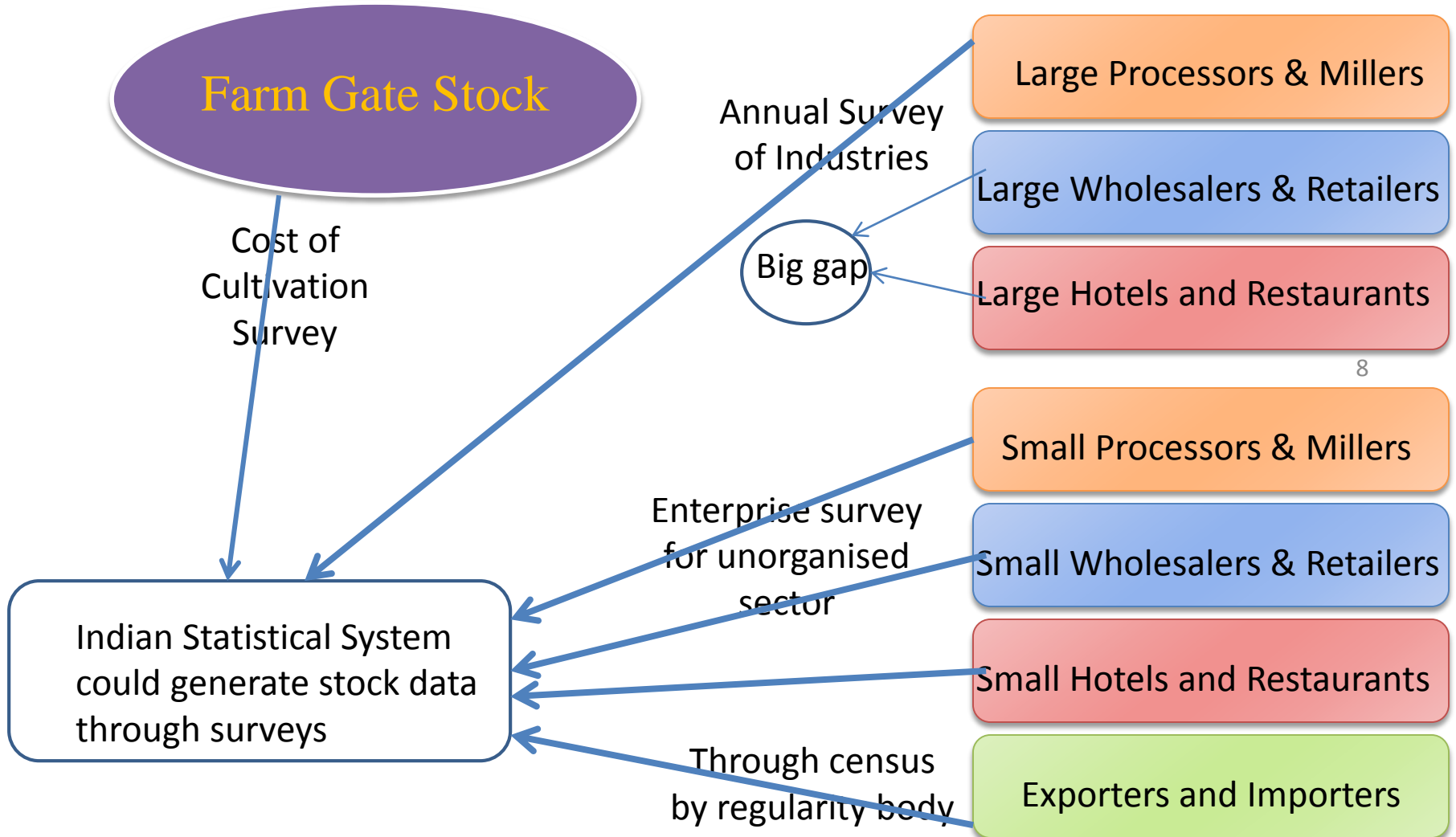
Small Wholesalers & Retailers

Small Hotels and Restaurants

Through census
by regularity body

Exporters and Importers

Indian Statistical System
could generate stock data
through surveys



WAY FORWARD

A fresh look at the Cost of Cultivation Survey

- CCS is an intensive surveys for data collection on inputs used for the cultivation of crop.
- Besides, CSS also collects demographic information of the farmers, post harvest transportation cost, production, sale, feed use, seed use and stock etc.

CSS can be viewed as Farm Management Survey having two components

Pre harvest Farm Management Survey

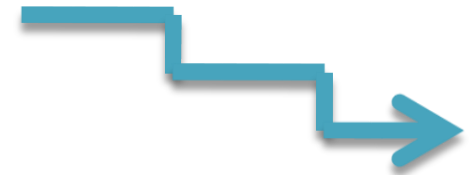
Outcome: Cost of cultivation that includes rent, cost of human labour, cost of machine use, cost of animal use, cost of seed, fertiliser and pest control, cost of irrigation etc

Post harvest Farm Management Survey

Outcome: production, sale, feed use, seed use and stock etc. cost of Marketing, farmer's practice on storage and protection of the stock, Farmers disposal in the market and farmers awareness about government procurement etc.

WAY FORWARD

- **Modified Sampling Design of CSS**
 - more elaborate schedule for 'receipt and disposal' of agricultural produce suggested
 - In a manner that the cost implication is very small.



WAY FORWARD_{-continued}

Two alternative designs suggested for field testing

Alternative-1

Modify the existing sample design by dividing the Tehsils into two sub-strata.

- Villages where “minor” crops are cultivated last year – sub strata 1
- Rest of the villages- sub strata 2

Thereby increasing the chance of capturing the “minor” crops

WAY FORWARD-continued

- There is no fixed definition of “minor” crops in set of Principal crops However, area under cultivation of crops may be arranged in descending order of magnitude and first few crops may be considered as major crop and rest may be taken as minor crop.
- **Decision may be left to the respective state**
- In exceptional cases there may not be any villages that did not cultivate any minor crop last year or all the villages in the thesil where farmers did cultivate one or the other minor crops. In such cases the sub statum will not be formed.

WAY FORWARD-continued

Alternative 2

The design is similar to the alternative 1 except for the fact that instead of the formation of sub-stratum at the Tehsil level Second stage Stratification should be done at village level by enumerating holdings used for cultivation of “minor” crops last year.

From each second stage stratum one holding from each size group should be selected.

The best alternative may be decided through a pilot survey

WAY FORWARD-continued

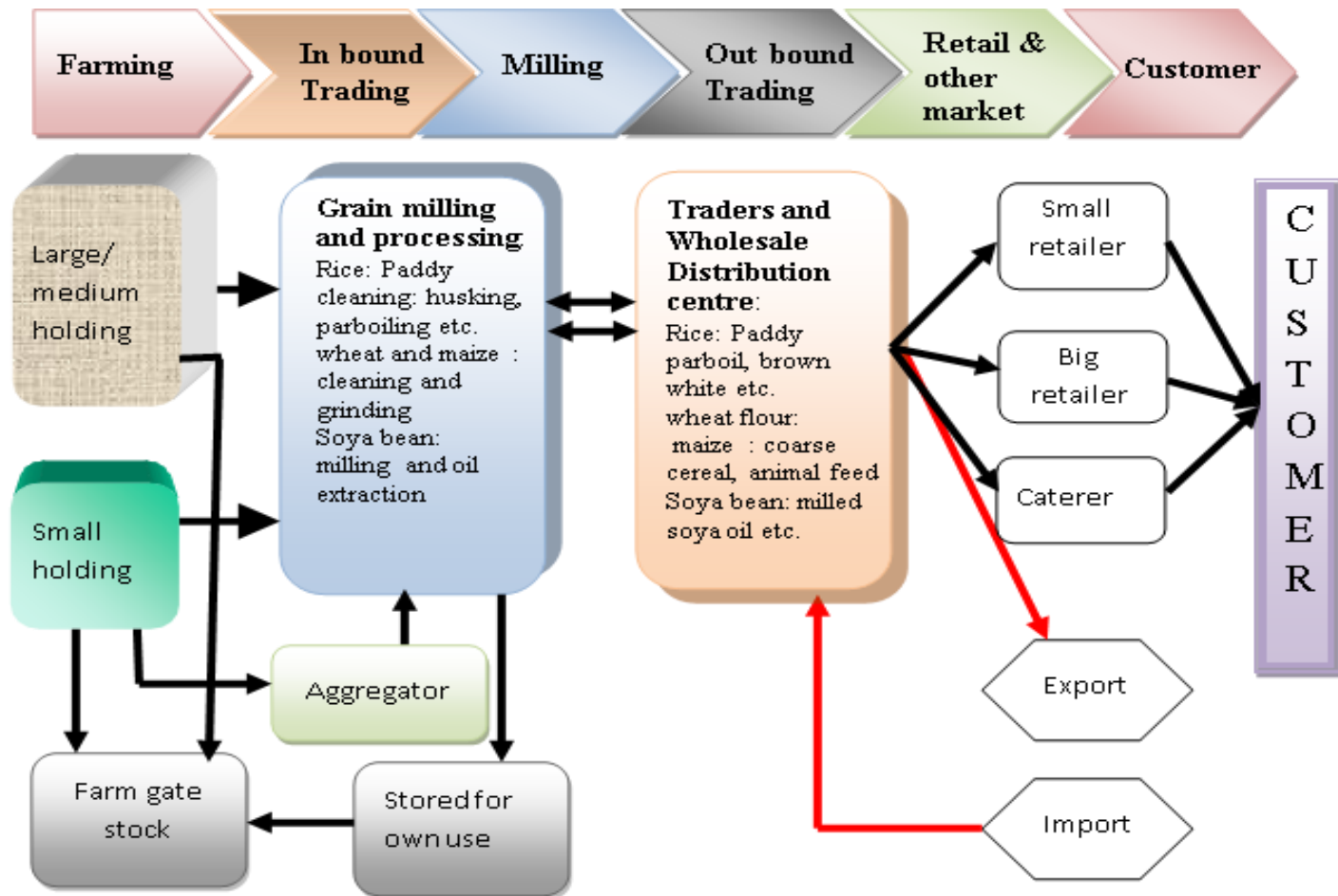
- Revised schedule:

The revised schedule has been extended to capture farmers practice, disposal in the market by the farmers, farmer's awareness about government procurement.

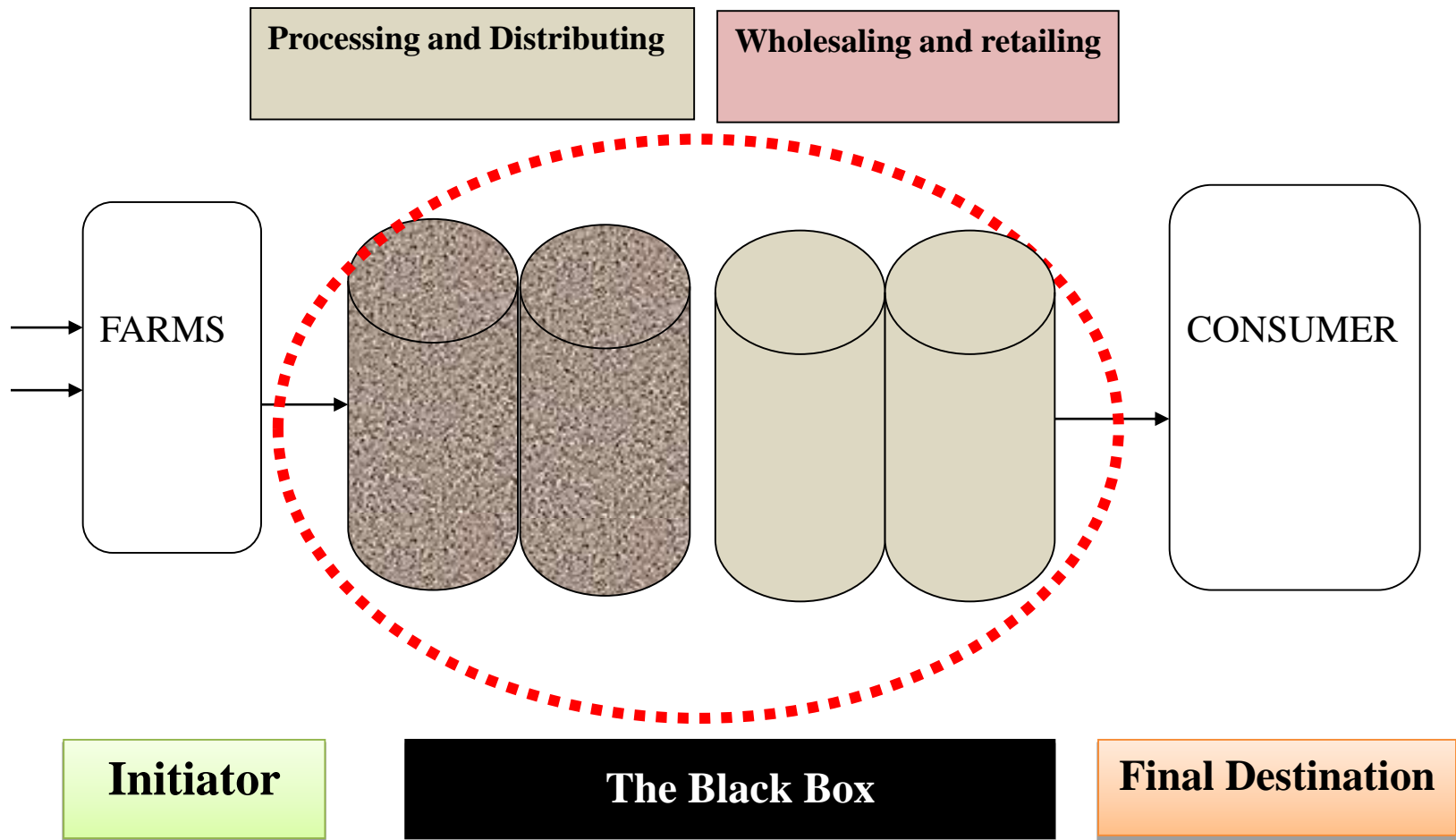
The [three page](#) schedule can be canvassed with the Cost of cultivation survey or separately surveyed on the operational holdings where cost of cultivation survey was conducted

Off Farm Private food Stock Estimation and Value Chain Analysis

Value Chain



Value Chain



Off Farm Private food stock Estimation

Various alternatives were thought of

1. Extending Annual Survey of Industry to enumerate stock held by millers and processors
2. NSS like stand alone survey for small enterprises
3. Continuous survey for small enterprises using Rotational panel survey methodology. etc.

Off Farm Private food stock Estimation

Finally it was thought to be logical to go for independent survey using Latest Economic Census Frame.

What is Economic Census ?

Off Farm Private food stock Estimation

- Census of all the establishments engaged in any economic activities of either agricultural or non-agricultural sector
- Excludes crop production, plantation, public administration, defence and compulsory social security of the country.

Off Farm Private food stock Estimation

- A list frame and an Area frame survey should done in same reference period.
- Quarterly survey is suggested
- Same samples are to be surveyed for three years aligning with agricultural stock survey.

Off Farm Private food stock Estimation

- Following are the focal industry for stock estimation survey

NIC	Description
106	manufacture of grain mill products, starches and starch products
107	manufacture of other food products
108	manufacture of prepared animal feeds
462	Wholesale of agricultural raw materials and live animals
469	non-specialized wholesale trade
471	retail sale in non-specialized stores
472	retail sale of food, beverages and tobacco in specialized stores
479	retail trade not in stores, stalls or markets
561	restaurants and mobile food service activities
562	event catering and other food service activities

NIC: National Industrial Classification

Off Farm Private food stock Estimation

- List frame consists of
List of enterprises having more than 20 or more worker.
- Area Frame- Sample survey to be undertaken.

Methodology

Off farm private stock estimation

Area frame:

- The Sixth Economic Census conducted during 2013-Apr-2014 may be the frame for food grain stock estimation survey.
- A stratified multi-stage design should be adopted for the food stock estimation survey.
- The first stage units (FSU) were the 2011 census villages/EB blocks in the rural sector and Census 2011 Enumeration blocks in the urban sector.

Stratification

Stratification: Within each state of a State/ UT, rural and urban strata may be formed in the following manner:

NIC	villages/Ebs having	Strata	NIC	villages/Ebs having	Strata
106	manufacture of grain mill products, starches and starch products	stratum 1	471	retail sale in non-specialized stores	stratum 6
	From remaining Ebs			From remaining Ebs	
107	manufacture of other food products	stratum 2	472	retail sale of food, beverages and tobacco in specialized stores	stratum 7
	From remaining Ebs			From remaining Ebs	
108	manufacture of prepared animal feeds	stratum 3	479	retail trade not in stores, stalls or markets	stratum 8
	From remaining Ebs			From remaining Ebs	
462	Wholesale of agricultural raw materials and live animals	stratum 4	561	restaurants and mobile food service activities	stratum 9
	From remaining Ebs			From remaining Ebs	
469	non-specialized wholesale trade	stratum 5	562	event catering and other food service activities	stratum 10
	From remaining Ebs				

Stratification

- Sub Stratification:

Districts will form sub-strata.

Total Sample:

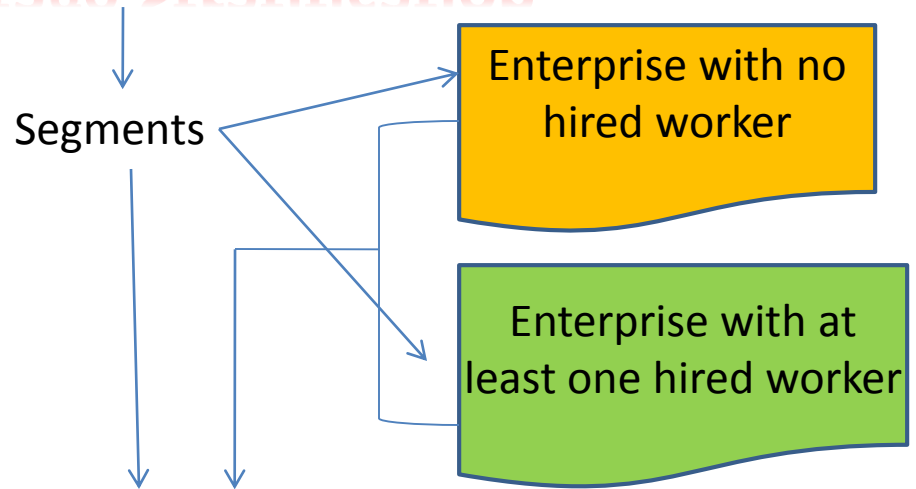
In the absence of any data on stock survey no estimate of number of sample can be determined to ensure the RSE to be ≤ 1 percent.

However from Enterprise survey, and analyzing the RSE of relevant NIC groups

Residual Standard Error	Sample village /EB required	Cost (in million Rs.)
≤ 1 Percent	16000	107.16
< 5 Percent	11500	85.21

Stratification

Second Stage Stratification



SSS 1 SSS 2 SSS 3 SSS 4

engaged in milling activity Wholesaling and Retailing hotels & Restaurant Others including online retailing

2 2 2 2

Second Stage Stratification

Sample enterprises

Selection

- Total Number of sample to be selected from each First Stage Unit- 16

FSUs are to be selected using PPSWOR using number of enterprises of interest as size.

Sample enterprises are to be selected using SRSWOR in each SSS.

Schedule

- [Please Click here](#)

Cost Analysis

Option-1: 16000 villages/Ebs: 256000 enterprises

Option-2: 11500 villages/Ebs: 184000 enterprises

Item heads	Option 1		Option 2	
	number	First year cost	number	First year cost
total worker needed	200	60000000	150	45000000
supervisory worker	20	12000000	15	9000000
tablet	210	3780000	160	2880000
Software development	-	3500000	-	3500000
consultants/researchers	5	10800000	5	10800000
Manager	2	4800000	2	4800000
Total		94880000		75980000
travel		12096000		9046000
Grand Total		106976000		85026000

Recommendation

- Separate surveys for farm gate stock measurement and Off farm stock assessment
- Though considerable cost involved in off farm survey, outcome is of great national interest.
- Pilot survey for field testing of alternatives suggested is required
- If implemented many country would follow the Indian method

THANK YOU