



Crop Sector in National Accounts: Some Suggestions for Improvement

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Plan of Presentation

- Methodology of GVA Estimation of Crop Sector
- Methodology for GVA of Crop sector on Financial Year basis.
- Methodology for GVA of Horticulture Crops
- Differences in area and production between DESAg and DES, States/ UTs.

GVA of entire Economy and Agriculture & Allied Sector at Current Prices: A Comparison

Year	GVA at Basic Price (in Rs. Cr)		Agri. & Allied Sector
	Economy	Agri. & Allied Sector	Share in Economy*
2011-12 (New Series Estimate)	81,06,656	15,01,816	18.5
2012-13 (New Series Estimate)	92,10,023	16,80,797	18.2
2013-14 (New Series Estimate)	103,80,813	19,02,452	18.3
2014-15 (1 st RE)	114,72,409	19,95,251	17.4
2015-16 (PE)	122,79,410	20,93,081	17.0
<i>* Share is measured at Current Price</i>			

GVA of entire Economy and Agriculture & Allied Sector at Constant Prices: A Comparison

Year	GVA at Basic Price (in Rs. Cr)		Agri. & Allied Sector
	Economy	Agri. & Allied Sector	Growth Rate #
2011-12 (New Series Estimate)	81,06,656	15,01,816	-
2012-13 (New Series Estimate)	85,46,552	15,24,398	1.5
2013-14 (New Series Estimate)	90,84,369	15,88,237	4.2
2014-15 (1 st RE)	97,27,490	15,84,293	-0.2
2015-16 (PE)	104,27,191	16,04,044	1.2
# Growth Rate are measured at Constant Price			

Sub Sector-wise Contribution

<u>Percentage contribution at Current Price</u>				
	2011-12	2012-13	2013-14	2014-15 (1st RE)
Agriculture & Allied Sector	100.0	100.0	100.0	100.0
Crops	65.4	64.9	64.8	62.8
Livestock	21.8	22.3	22.6	25.1
Forestry & logging	8.3	8.0	7.5	6.9
Fishing	4.5	4.8	5.1	5.2

Coverage (Crop Sector)

- Growing of **perennial** and **non-perennial crops**
- Plant propagation, harvesting, baling and thrashing, preparation of crops for marketing, pest control, spraying, pruning, picking and packing.
- Ancillary activities of cultivators such as gur making and transportation of own produce to primary markets.
- Operation of irrigation system: Supply of water through various Government channels to the agriculturists.

Methodology of GVA Estimation- Crop Sector

- Crop Sector is compiled, using Production Approach. However, Operation of irrigation system by government sources is evaluated using *Income Approach*.
- Output evaluated at *Farm Harvest Price/Producers' Price*.
- Inputs are evaluated at *Purchasers' Prices*.
- Value of Output:
 - Production*Price (Production & Price both available)
 - Production*Estimated Price (Production available but Price not available)
 - Area*VPH (Production and Price not available but area available)
 - VPH estimated on the basis of results of specific Surveys/Benchmark Studies.
- Gross Value Added = Gross Value of Output - Inputs

A. Methodology for GVA of Crop sector on Financial Year basis

- Current Practice
 - Annual National Accounts Estimates corresponds to FY
 - Livestock, Forestry and Fisheries sectors are compiled on FY basis.
 - Crop Sector is estimated partly AY and partly FY.
 - ❖ GVO : GVO is estimated on Agriculture Year basis
 - ❖ Inputs: Most inputs such as Fertilizers, Pesticides, electricity etc. are estimated on FY basis

Why to shift AY → FY

- Annual National Accounts Estimates corresponds to FY.
- Currently used Crop sector estimate corresponds to AY and not to FY, therefore real picture of National Accounts for FY is distorted.
- If one Agriculture year is bad and the next agriculture year is good, then financial year estimates is a mixed bag of the two (bad Khariff and Good Rabi).
- Probability of Annual Data availability :
 - Output: Production estimates of Major crops are released by M/o Agriculture & Farmers' Welfare on Quarterly Basis, which can be aggregated to obtain Annual estimate
 - Input: Already, mostly corresponds to FY basis

Share of production estimate of last quarter

Year wise and Group wise Percentage contribution of last quarter (April-June)

Crop Groups	2011-12	2012-13	2013-14	2014-15
Cereals	33.1	32.4	32.7	33.0
Pulses	13.4	14.5	15.3	16.6
Oilseeds	11.1	12.7	12.9	12.7
Fibre	4.1	4.5	3.3	3.5
Condiments and Spices	11.5	11.3	12.6	13.8
Fruits & Vegetables	18.7	18.6	18.6	NA
Sugar	19.8	20.1	20	20.4
Tobacco	9.1	10.8	NA	11.3

Source: M/o Agriculture and FW

Methodology

- Financial Year estimate (i) = $AY(i) - Q_4(i) + Q_4(i-1)$,

Where,

- $AY(i)$: Annual Production estimate corresponding to Agriculture Year ' i '
- $Q_4(i)$: Fourth Quarter Production estimate corresponding to Agriculture Year ' i '
- $Q_4(i-1)$: Fourth Quarter Production estimate corresponding to Agriculture Year ' i-1 '

Agriculture Year (i-1)				Agriculture Year (i)			
Q1(i-1)	Q2(i-1)	Q3(i-1)	Q4(i-1)	Q1 (i)	Q2(i)	Q3(i)	Q4(i)
				Financial Year (i)			

Results

- **Comparative difference in estimate of GVA using Agriculture Year and Financial Year**

GVA (in Rs. Crore)	2011-12	2012-13	2013-14	2014-15
AGRICULTURE YEAR	950139	953272	997761	957189
FINANCIAL TEAR	939780	953966	991283	989255
DIFFERENCE	-10360	694	-6478	32066
% DIFFERNCE	-1.1	0.1	-0.6	3.4

Growth Rate (in %)	2011-12	2012-13	2013-14	2014-15
AGRICULTURE YEAR		0.3	4.7	-4.1
FINANCIAL TEAR		1.5	3.9	-0.2

B. Methodology for GVA of Horticulture Crops

- Coverage:- It consists of fruits, vegetables, root and tuber crops, flowers, ornamental plants, medicinal and aromatic plants, spices, condiments, plantation crops and mushrooms.
- Share:- GVO of Horticulture crops to Total GVO of Crop sector: 30% . It is in increasing trend.
- Current Practice: Horticulture Sector Compiled along with traditional Food-grains crops due to unavailability of separate inputs.

Methodology

- **Value of Output:**

- Production are supplied by M/o Ag & FW and DES (States)
- Prices are supplied by DES (States)

- **Inputs:**

- **Method:**

- Crop-wise per hectare Input rates (in Rs./Hectare) to be estimated from I/O ratios along with the distribution on major inputs.
- Constant Price input estimate: Cropped area* per hectare Input rates
- Current Price input estimate: Cropped area* per hectare Input rates inflated with a composite index of price based on distribution of inputs.

- **Sources of data :**

- CCS (M/o Ag. FW, 13th FC) and Crop specific Pilot studies on Input conducted by research institutes.

Coverage of the Crops

Crop sub-group	Crop Coverage	Share in respective Crop sub-group
Vegetables	Onion, Potato, Green Peas, Tomato, Okra, Tapioca, Brinjal, Cabbage, Carrot, Watermelon, Beans	≈ 70%
Fruits	Banana, Mango, Papaya, Jack Fruit, Guava, Grape	≈ 60%
Condiment and Spices	Black pepper, Ginger, Turmeric, Chillies, Cardamom, Areca nut, Tamarind	≈ 70%

Crop-wise Sources

VEGETABLES		FRUITS		CONDIMENT & SPICES	
States	Sources	States	Sources	States	Sources
Onion		Banana		Arecanut	
Andhra Pradesh	CCS (MOAGFW)	Kerala	XIII FC	Kerala	XIII FC
Gujarat	CCS (MOAGFW)	Tamil Nadu	XIII FC	Black pepper	
Karnataka	CCS (MOAGFW)	Papaya		Kerala	XIII FC
Maharashtra	CCS (MOAGFW)	Gujarat	Pilot Study	Tamil Nadu	XIII FC
Tamil Nadu	XIII FC	Mango		Ginger	
Potato		Andhra Pradesh	XIII FC	Kerala	XIII FC
Punjab	CCS (MOAGFW)	Tamil Nadu	XIII FC	Turmeric	
Haryana	CCS (MOAGFW)	Jack Fruit		Kerala	XIII FC
Bihar	CCS (MOAGFW)	Tamil Nadu	XIII FC	Tamil Nadu	XIII FC
Himachal Pradesh	CCS (MOAGFW)	Guava		Tamarind	
Uttar Pradesh	CCS (MOAGFW)	Tamil Nadu	XIII FC	Tamil Nadu	XIII FC
West Bengal	CCS (MOAGFW)	Grapes		Chilli	
Tamil Nadu	XIII FC	Tamil Nadu	XIII FC	Tamil Nadu	XIII FC
Green Peas		Cardmom			
Punjab	Pilot Study	Tamil Nadu XIII FC			
Toamto					
Himachal Pradesh	Pilot Study				
Tamil Nadu	XIII FC				
Okra					
Uttar Pradesh	Pilot Study				
Tapioca					
Kerala	XIII FC				
Tamil Nadu	XIII FC				
Brinjal					
Andhra Pradesh	Pilot Study				
Cabbage					
Tamil Nadu	XIII FC				
Carrot					
Tamil Nadu	XIII FC				
Beans					
Tamil Nadu	XIII FC				
Watermelon					
Tamil Nadu	XIII FC				

I/O and the distribution of various inputs

Crop	I/O (in %)	Distribution of various inputs					
		Seed / Sapling	Animal Charges	Machine +R & M	Fert/ Manure	MC	Others
Fruits	19.3	10.6	N/A (0.0)	5.2	57.9	18.4	7.9
Vegetables	26.9	23.0	2.4	12.5	39.0	18.8	4.4
Condiment & Spices	19.1	12.7	0.1	10.6	54.7	21.9	0.0

Estimate (in Rs. Cr.) at Constant and Current Prices

Year		(Constant)				(Current)		
		11-12	12-13	13-14	14-15	12-13	13-14	14-15
ALL CROPS	GVO	1191337	1199190	1250916	1208495	1336704	1517550	1528700
	INPUT	209654	212593	216037	218414	240456	271772	283664
	I/O	17.6	17.7	17.3	18.1	18.0	17.9	18.6
	GVA	981683	986597	1034880	990082	1096249	1245778	1245036
HORT.	GVO	316802	330065	340671	341719	367951	438298	483379
	INPUT	68137	68208	70896	74036	75548	84002	89598
	I/O	21.5	20.7	20.8	21.7	20.5	19.2	18.5
	GVA	248665	261857	269775	267684	292403	354296	393781
CROPS EXC- - HORT.	GVO	874535	869125	910246	866776	968754	1079252	1045321
	INPUT	141517	144385	145141	144378	164908	187769	194066
	I/O	16.2	16.6	15.9	16.7	17.0	17.4	18.6
	GVA	733017	724740	765104	722398	803846	891483	851255

C. Differences in Area and Production between DESAg and DES, States/ UTs

- NAD uses the area and production estimates of Major crops released by DES, Ministry of Agriculture & FW.
- The DES, States/UTs also uses their own area and production estimates of Major crops.
- Consistent difference is observed in area and production between DESAg and States / UTs DES.
- The details are in the Paper.

Item-wise difference in Area and Production with State DES observed during comparable discussion

State	Crop	2012-13					
		DESAg		DES		Difference	
		Prod	'000 tonne	Prod	'000 tonne	Prod	'000 tonne
Arunachal Pradesh	Paddy		394.5	-		-	
	Arhar		0.5	0.478		0.022	
	Moong		0	1.094		-1.094	
	Groundnut		0.5	0.546		-0.046	
Assam	Paddy		7692.75	8019.13		-326.38	
	Sugarcane		1028.2	1028.161		0.039	
	Kapas		0	0.86		-0.86	
Bihar	Paddy		11293.95	12483.02		-1189.07	
	Wheat		5357.2	6174.26		-817.06	
	Maize		2475.9	2755.954		-280.054	
	R & M		98.3	138.518		-40.218	
	Sunflower		23.1	22.255		0.845	
	Sugarcane		12741.4	12741.42		-0.015	
Chhattisgarh	Paddy		9913.2	11772.6		-1859.4	
	Gram		285.2	304.859		-19.659	
	Arhar		32.3	31.007		1.293	
	Urad		30.2	31.359		-1.159	
	Moong		4.9	4.237		0.663	
	Lakh		270.7	159.868		110.832	
	Linseed		8.9	13.416		-4.516	
	Groundnut		34.9	40.504		-5.604	
	R & M		25.8	23.851		1.949	
Gujarat	Paddy		2311.5	2246		65.5	
	Ragi		14	16.5		-2.5	
	Gram		168.2	133.1		35.1	
	Urad		57	60.1		-3.1	
	Sesamum		34	63.9		-29.9	
	Soyabean		47	36.3		10.7	
	Sugarcane		12690	12615.6		74.4	
	Kapas		4513.5	2525		1988.5	

Item-wise difference in Area and Production with State DES observed during comparable discussion

State	Crop	2012-13					
		DESAg		DES		Difference	
		Prod	'000 tonne	Prod	'000 tonne	Prod	'000 tonne
Himachal Pradesh	Paddy		187.95		129.04		58.91
	Wheat		608.6		608.82		-0.22
	Peas		29.9		29.9		0
J & K	Paddy		1227.15		818.05		409.1
Jharkhand	Paddy		4747.35		4747.38		-0.03
	Gram		162.3		162.32		-0.02
Karnataka	Small Millets		11		8.426		2.574
	Arhar		366.3		467.109		-100.809
	Urad		53		52.239		0.761
	Horsegram		80		77.917		2.083
	Groundnut		395		395.17		-0.17
	Castor		7		7.142		-0.142
	Nigerseed		3		2.791		0.209
	Sesamum		38.3		13.264		25.036
	R & M		1		0.65		0.35
	Linseed		2.3		1.206		1.094
	Safflower		30		30.32		-0.32
	Sunflower		265		265.548		-0.548
	Soyabean		178		177.805		0.195
	Kapas		1255		523.295		731.705
	Madhya Pradesh	Paddy		4162.5		4534	
Wheat			13133.4		16518		-3384.6
Jowar			575		606		-31
Bajra			502		391		111
Barley			114.9		109		5.9
Maize			1513.6		2389		-875.4
Gram			3812.4		3321		491.4
Arhar			351		318		33
Urad			390.1		260		130.1
Masoor			333.4		297		36.4
Khesari			35.9		40		-4.1
Moong			40.9		32		8.9
Horsegram			4.9		7		-2.1
Linseed			57.4		48		9.4
Sesamum			157.1		145		12.1
Groundnut			311.7		357		-45.3
R & M			919.2		962		-42.8
Castor			0.7		1		-0.3
Nigerseed			29.8		25		4.8
Soyabean			7800.1		84.16		7715.94
Sugarcane		2641.9		2760		-118.1	
Kapas		1122		612		510	

Concluding Remarks

- Financial Year Estimate
 - State-wise Crop-wise crop calendar should be updated.
 - Horticulture data need to be made available on FY basis.
- Horticulture GVA
 - Data on inputs covers few states and for the rest of India we are assuming the same ratio.
 - After the complete results of CCS under XIII FC are available, the estimates would be more robust.
- Difference in Area & Production
 - Modern facilities of communication may be used by DESAg and States / UTs DES for collecting, collating and finalizing the estimates.



THANK YOU