



**STATEWISE ESTIMATES OF VALUE OF OUTPUT
FROM AGRICULTURE AND ALLIED ACTIVITIES
WITH
NEW BASE YEAR 2004-2005
(2004-05 TO 2008-09)**

2011

**CENTRAL STATISTICAL OFFICE
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PREFACE

The agriculture and allied activities (livestock, forestry and fisheries) play a vital role in the Indian economy. Important developments in this sector have taken place over the years particularly after the green revolution, white revolution and blue revolution. The contribution of this sector to the gross domestic product (GDP) is estimated in terms of gross value added (GVA) using the production approach. The estimation of GVA involves valuation of the products and by-products and ancillary activities at the prices received by the producers after deducting the value of inputs of raw materials and services consumed in the process of production at purchasers' prices. In this context, information on state-wise value of output assumes considerable importance. With this in view, a brochure containing state-wise value of output of agriculture and allied activities is disseminated by CSO at regular intervals. The present one is sixth in the series including the state-wise estimates of value of output of Agricultural crops, Livestock products, Forestry and Fisheries with base year as 2004-05.

The earlier publications containing the state-wise estimates of value of output from Agriculture and Allied Activities from both at current and constant prices are as follows:

Sl No	Series	Base year	Year released
1	1960-61 to 1980-81	1970-71	1985
2	1980-81 to 1990-91	1980-81	1996.
3	1990-91 to 2001-02	1993-94	2004
4	1990-91 to 2002-03	1993-94	2006
5	1999-2000 to 2005-06	1999-2000	2008

We welcome suggestions for further improvement.

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Methodology

(A) Valuation of Output of Agricultural Crops

The sources of data used in the preparation of the value of output are as under:

- (i) The estimates of area and production of 42 crops (25 major crops and 17 minor crops) covered in crop groups: (1) Cereals, (2) Pulses, (3) Oil seeds, (4) Sugar, (5) Fibers (6) Drugs and Narcotics, (7) Condiments and Spices (8) Fruits and Vegetables (9) Other crops (10) By-products and (11) Kitchen Garden, at State level are obtained from the DESAg. The estimates of area and production of Fruits and Vegetables, not covered by DESAg are obtained from National Horticulture Board (NHB). The estimates of area and outturn of plantation crops viz., Tea, Coffee, Rubber, Arecanut, Cashewnut and Cocoa are obtained from their respective commodity boards and area and outturn of opium is obtained from Central Bureau of Narcotics. However, in the case of sugarcane, outturn excluding the quantity converted into gur by the cane growers is taken and gur is evaluated separately.
- (ii) In the case of tea, the estimates of output available from Tea Board relate to production of processed tea instead of raw tea leaves. Since processing is the activity outside the scope of agriculture, the output of raw tea leaves alone is to be taken into account in the agriculture sector and this is taken to be equal to the input of raw tea leaf in the tea processing industry. The production of tea leaves is estimated as 4.44 times of the processed tea. This norm of 4.44 has been estimated by the Tea Board on the basis of Techno-Economic Surveys. These norms are consistent with the study conducted by the DES, Assam(2006).
- (iii) The crops which do not have significant contribution in each of the groups are clubbed under 'other....' of each category. The data on area under such crops is available from Land Use Statistics. Such information is obtained through state DESs and DESAg. Value per hectare is derived from the respective groups.
- (iv) **Toddy:** Toddy crop, a beverage, has now been included. NSSO Publication entitled "Consumption of some important commodities in India 2004-05"(National Sample Survey, 61st round), provides monthly per capita quantity and value of consumption for non-food items for each state and UT (with rural and urban break up) and Toddy (in litre) is one of the items (item No.331). The value of Toddy production is estimated by multiplying the value of Toddy consumption in rural and urban area in a State by respective rural and urban population.
- (v) **Betel Leaf:** In Assam, the arecanut consumption to betel leaves is 1:4; and about 20% of arecanut production is used for dying purposes. On the basis of this rate, Betel leaf production is estimated for Assam in the 1999-2000

series of National Accounts. For rest of the States production approach is adopted.

- (vi) **Kitchen garden:** Production of crops in foreyard/backyard of houses was taken into account for the first time in the national accounts in the 1993-94 series. The information available in the Report “*Operational Land Holdings in India, 1991-92 Salient Features*” March, 1997 and Livestock Holding Survey, 1991-92, NSS (48th round)” was used to estimate the total area under kitchen garden. Since the Survey is conducted only once in 10 years, estimates of area under kitchen garden are not available on annual basis. Therefore, for the subsequent years, the ratio of total area under kitchen garden to the total rural area operated at all-India level (0.21 per cent) as observed in 1991-92, has been assumed to be constant for the subsequent years. As no data under kitchen garden was compiled during Livestock Holding Survey, NSS (59th round), old norm i.e., ‘0.21 per cent of the net sown area’ has been used for estimating area under kitchen garden for the new series. The estimates of value of output on account of production of crops in foreyard/backyard were made using these area estimates and the value per hectare of fruits and vegetable crops.
- (vii) **Floriculture:** Data on area, production of loose flowers in quintals and spikes in numbers along with respective prices are available annually in the publication titled ‘Indian Horticulture Database’ of NHB. In 1993-94 series its value was estimated using the NHB data. In the 2004-05 series production is taken from NHB and the prices from the respective State DESs.
- (viii) **Other crops:** Other crops are non-food crops not classified elsewhere. Direct outturn estimates are not available. The estimates of output for these crops are obtained by applying an appropriate average value of yield per hectare to the total area under these crops.
- (ix) **Fodder and Grass:** The rates used for estimating production of fodder in the old series were 7.0 Tonne/Hectare for Karnataka and Rajasthan, 2.82 tonne/hectare for Maharashtra and 9.34 Tonne/Hectare for other states. For the current series, these rates are on the basis of the study conducted in 2004-05 by the Socio-Economic Research Centre, New Delhi, which are as under:
Yield of cultivated Green Fodder
 - 50 tonne/hect. for Irrigated Land
 - 25 tonne/hect. for Un- irrigated Land
- (x) Grass is estimated on the basis of the combined area under permanent pasture land, miscellaneous tree crops, fallow lands and net areas sown (using the appropriate weights for different types of areas), which is based on NSS 1955-56 report. Fodder and grass are evaluated at producer prices received from DESs.
- (xi) **Sugarcane and Gur:** Conversion of sugarcane into gur is an activity undertaken by the agriculturists. The total sugarcane production is divided

into two parts viz., sugarcane utilized as such and the sugarcane converted into gur. While the former is evaluated at sugarcane prices, the latter is evaluated at corresponding gur prices. Estimates of gur production are not directly available. The estimates are worked out using information on quantity of sugarcane used for various purposes. The information on utilization of sugarcane for seed, chewing, juice making etc., is gathered from the State Agricultural Departments, DMI and the CCS. The quantity of sugarcane crushed by the factories for the manufacture of crystal sugar is obtained from the Directorate of Sugar & Vanaspati, Ministry of Agriculture. The consumption of sugarcane for the production of khandsari, bura etc., is estimated separately for the registered and unregistered establishments from the ASI and NSSO respectively. Out of the total sugarcane, the quantity of sugarcane left over after allowing for the above uses is assumed to be converted into gur.

- (xii) The conversion rates from sugarcane to gur are taken from the production estimates of sugarcane in terms of gur, released by the DESAg. Bagasse obtained as a by-product during conversion of sugarcane into gur was estimated as 35 per cent of gur production. Socio Economic Research Centre (SERC) in a study obtained the quantity of bagasse production in 100 kg. of gur production from Sugarcane Breeding Institute, Coimbatore.
- (xiii) **By-products:** In the process of cultivation of crops and their processing by indigenous methods, several by-products are also produced. However, for the estimation of GVA only those by-products which are readily identifiable and have some definite economic value are considered. The value estimates of these by-products are based on the results of Cost of Cultivation Studies (CCS). The value per unit area of the by-products available from the CCS is directly utilized for arriving at the value of output.
- (xiv) Valuation of crop production is done by multiplying the quantities of production by the corresponding producers' prices.
- (xv) For evaluation purposes of these crops, the producers' prices correspond to average wholesale prices ruling in the primary markets during the peak marketing periods and are furnished by the State Directorates of Economics and Statistics (DESs) to Central Statistical Office (CSO). The wholesale prices are collected by the agriculture produce marketing committees of State Agriculture Departments or by the DESAg under the market intelligence scheme of DESAg. For averaging the weekly wholesale prices available from the selected primary markets, the following procedures are adopted by State DES.
 - (a) Arithmetic averaging of the prices at the various centers within a district is done to get the weekly district prices.
 - (b) Average price for a district is worked out as the arithmetic average over the 'peak marketing period' of weekly prices obtained at (a) above.

- (c) State average price is obtained as a weighted average of the district wise prices derived at (b) above, weights being the district-wise production of the corresponding crops.

(B) Valuation of Output of Livestock Products

For purpose of estimation of value of output, the livestock products are divided into 7 broad groups viz., (i) milk, (ii) meat, (iii) eggs, (iv) wool, (v) dung, (vi) silk worm cocoons & honey, and (vii) increment in stock. The source of data used in the preparation of the value of output is as under:

- (i) **Milk group:** The milk group comprises of milk consumed or sold in fluid form, ghee, butter and lassi produced by the producer households. It has been observed, during discussions with the DES that the quantity of milk used for conversion into ghee, butter and lassi by the producer households was quite minimal and the products converted are consumed mostly by the households themselves. Thus the evaluation of milk has been done as though it is consumed and sold in the fluid form itself. The milk production estimates released by the Department of Animal Husbandry, Dairying and Fisheries (DAHDF), Ministry of Agriculture are used for working out the value of output. The main source of data for milk production is the Integrated Sample Survey (ISS). In some States goat and buffalo milk are not estimated by DAHD. Production of milk, in such cases, is estimated by using yield rate prevalent in the neighboring States and the production so estimated is added to the production estimated by DAHD. Production of camel milk is also estimated by using the yield per camel in Gujarat.
- (ii) **Meat group:** Meat group comprises of meat (including edible offals & glands and poultry meat), meat products (fats, heads, legs, etc.) and by-products comprising hides (cattle and buffalo hides), skins (goat and sheep skin) and other products like guts, blood, bones, horns, hoofs etc. The States estimate the total production of meat both from registered and unregistered slaughter houses. The estimates of meat products and by products are based on the number of slaughtered animals and fallen animals, wherever applicable and the corresponding yield rates. In the 2004-05 series the value of meat by- products (guts , blood , bones , horns , hoops , etc.) excluding hides and skins has been estimated as a percentage of the total value of meat and meat production , in place of the earlier procedure of estimating each and every by product using certain ratios of meat production for different categories of animals. The ratios used for estimating the value of meat by products of different animals to value of meat and meat production are 13.2% for cattle , 13.3% for buffalo , 2.4% for goat , 2.5% for sheep and 5% for pig. The old yield rates have been updated using the results of the study conducted by the CSO in 6 states during 2004-05.

- (iii) **Eggs & poultry meat:** The data on production of eggs is estimated through ISS and is furnished by the Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture. The estimates of poultry meat are prepared using the information on utilization of eggs for hatching(fixed ratio (as provided by the States)* total egg production) and chickens survived. The data are collected through ISS in some of the States. IASRI and some of the State Animal Husbandry Departments also conduct poultry surveys and collect these data. Poultry meat is estimated in terms of number of adult fowls and chickens slaughtered. Poultry meat production equals 50 per cent of the total adult fowls plus chickens & ducklings killed. The latter is worked out as estimated number of chickens during the year plus chickens survived during the year plus 50 per cent of adult fowls minus estimated number of total fowls of the following year.
- (iv) **Wool and Hair:** In the new series of NAS, SERC has suggested that average yield rate of hair from single humped camel as 700 gm./animal/year and that of a double humped camel as 3.0 kg./animal/year. For revising the yield rates of pig bristles, CSO conducted a Study during Pig Fair at Bhongaon, District Mainpuri (UP). Average yield rates of pig bristles are estimated as 155 gm per pig per year.
- (v) **Dung:** The estimates of production of dung are prepared on the basis of information on population and evacuation rates supplied by the Department of Animal Husbandry, Dairying and Fisheries (DAHDF), Ministry of Agriculture. The evacuation rates and population estimates are based on the ISS. For the remaining States, for which estimates are not available, the rates pertaining to the adjoining States along with the annual estimated animal population are used for arriving at the dung production estimates. Dung is used as manure as well as fuel. The utilization rates of dung for (i) dung used as manure and (ii) dung used as fuel is supplied by the (DAHDF), Ministry of Agriculture.
- (vi) **Silk worm cocoons and honey:** The annual outturn estimates of silk worm cocoons by types (viz., mulberry, tasar, ericot and muga) and honey are obtained from Central Silk Board and KVIC respectively on a regular basis.
- (vii) **Increment in stock:** The annual net increase in the population in each state is estimated separately for each category of livestock on the basis of the projected population. The population has been projected on the basis of growth rates observed between two Livestock Censuses i.e. ILC 2003 and ILC 2007.
- (viii) **Evaluation of Livestock production** is done by multiplying the quantities of production by the corresponding producers' prices. The prices of livestock products are obtained in special return by the State DESs to ensure reasonable coverage of state-wise prices of important livestock/livestock products. The state-wise prices are worked out as the simple average of all available price observations.

(c) Valuation of Output of Forestry

- (i) The data on production and prices of industrial wood and that on non timber forest products, as well as on prices of fuel wood are supplied by the State Forest Departments (SFDs). The data on production of industrial wood generally relates to the quantities sold/auctioned at the assembling centers by the SFDs. In the case of minor forest products, the information on their production is generally not available. However, information is built up on the basis of royalty received (in value terms) from those authorized to exploit these minor forest products from the forests. The value of non timber forest products could be the royalty figures or economic value derived from the royalty figures. The estimates of production of fuel wood are prepared on the basis of five-yearly consumer expenditure surveys of the National Sample Survey Organization (NSSO).
- (ii) **Industrial Wood:** The estimates of value of output at current prices are prepared by multiplying the category-wise production figures with their respective average annual prices (at the assembling centers), both of which are supplied by the SFDs. However, this information relates only to the authorized produce of Government forests. In addition to the production of industrial wood from these Government forests, there would be (i) authorized (but unrecorded) and unauthorized removals of timber from reserved/protected forests and (ii) unrecorded production from private owned forests and non-traditional forest areas (e.g., trees in village common fields, ridges, canal sides, road sides, fruit trees no longer productive etc.). The authorized removals are those done by the right holders staying in the periphery of natural forests and are generally not recorded in the official records of production. In order to account for the production of industrial wood, a norm of 10 per cent of recorded production (as reported by the SFDs) is adopted. However, it has been observed that there is a considerable production of wood from social forests and other plantations outside forests. Therefore, in the new series 2004-05, data on industrial wood produced from Trees Outside Forests(TOF) has been included in output estimates of forestry sector, in consultation with the Ministry of Environment and Forests. The data on output of industrial wood from tree outside forests has been provided by the Forest Survey of India(FSI).
- (iii) **Non Timber Forest Products(NTFP):** Data on quantity and producer prices of most of the minor forest products (MFPs) now classified as Non Timber Forest Products(NTFP) are available from the SFDs. The items of NTFP vary from state to state. Previously, output of fodder from forests sources was not included in the National Accounts compilation. In the new series 2004-05, this item has been included in consultation with the Ministry of Environment and Forests, as part of non timber forest products. It has been estimated by the Forest Survey of India that at the national level, 15.5% of the livestock population is solely dependent on forest areas for fodder/roughages.
- (iv) **Fuel wood:** It constitutes an important basic need for large segment of the population in India. The quantity/output of fuel wood is estimated through consumption approach, as reliable estimates on production of fuel wood are

not directly available. Data on prices are available from state DESs. The estimated production of fuel wood is based on three components, namely (i) household fuel wood consumption, (ii) agricultural by-products used as fuel wood (this amount is to be subtracted from the total consumption of fuel wood by the households, as it is already accounted for in the agriculture sector as by-products) and (iii) fuel wood consumed by industries and on funerals. The estimated value of output of fuel-wood is based on (a) the estimation of fuel wood consumption as available from the Quinquennial Surveys of Consumer Expenditure, conducted in the NSS 55th (1999-2000) and 61st (2004-05) Rounds (b) subtracting from the household total consumption of fuel wood estimated from NSS data, the actual estimates of value of output of agricultural products, namely, cotton sticks, arhar sticks and jute sticks, rapeseed stick, sunflower stick, castor sticks, baggase and whose value of output is already taken into account in the agriculture sector (this gives the total firewood consumption from forest sources) and (c) estimating afresh the consumption of firewood in the industry and on funerals is used 6% of total firewood consumption.

(d) Valuation of Output of Fisheries

- (i) **Marine fish:** Data on estimated landings of marine fish, prices and value of fish catch are directly obtained from the State Fisheries Department of maritime states/union territories. For the estimation of marine fish production almost all maritime States follow the statistical sampling design. The produce of prawns is separately valued.
- (ii) **Inland fish:** The data on inland fish production are also supplied by the SFDs. By and large the estimates are prepared on the basis of market arrivals of fish or on the basis of surveys conducted in selected landing centers; the key information that is used in collecting data on inland fish is on the data in respect of inland water bodies. The produce of prawns is separately valued.
- (iii) **Subsistence fishing:** The data supplied by the SFDs includes production from subsistence fishing, in the case of most of the states. For other states, it is estimated at 12.5 per cent of inland fish production. This ratio has been arrived at on the basis of type studies conducted by few state Governments.
- (iv) **Salting, Sun-drying and Frozen Fish:** Most maritime states resort to allied activities of fish curing, which include salting and sun drying of fish. The data on quantities and prices of fish let-in (raw fish going into salting, sun drying and frozen purposes) and fish let-out (the resultant salted, sundried and frozen fish) is also available from, the SFDs.
- (v) **Other products:** Data on producer prices and value of output in respect of gathering of pearls, chanks, oysters, sea-weeds, lime-shells, sea-shells etc., are not available, as such these are not included. However, from the available data from a few states, it is assessed that the contribution of these activities is not significant.

- (vi) **Prices:** For working out the value of output, the average annual auction prices of marine fish (species wise) collected by the SFDs at the landing centers and the inland fish prices reported by the SFDs from the assembling centers, are used.

The users may refer for further details on the methodology of estimation, to the CSO publication entitled “National Accounts Statistics, Sources and Methods”, 2007 and “New Series on National Accounts Statistics (Base Year 2004-05)”. The value of output in respect of 61 crops or crop groups, 7 Livestock groups, 3 Forestry groups and 2 Fisheries groups has been presented in this brochure. For each groups information is given in the form of two statements. The first statement contains information on state-wise value of output at current prices for 2004-05 to 2008-09. This is followed by a statement providing information on state-wise value of output of crop/crop group at constant prices (2004-05) for 2004-05 to 2008-09.