

AGRICULTURE AND ALLIED ACTIVITIES

Coverage

- 9.1 The sector comprises agriculture proper, livestock and livestock products and operation of irrigation system. The economic activities included in agriculture proper are (i) growing of field crops, fruits, nuts, seeds and vegetables, (ii) management of tea, coffee and rubber plantations, (iii) agricultural and horticultural services on a fee or on contract basis such as harvesting, baling and thrashing, preparation of tobacco for marketing, pest control, spraying, pruning, picking packing, and (iv) ancillary activities of cultivators such as gur making, transportation of own produce to primary markets, activities yielding rental income from farm buildings and farm machinery and interest on agricultural loans. Livestock and livestock products include breeding and rearing of animals and poultry besides private veterinary services, production of milk, slaughtering, preparation and dressing of meat, production of raw hides and skins, eggs, dung, raw wool, honey and silk worm cocoons and increment in livestock. Although the production of meat and meat products, by-products are covered under the manufacturing sector in the ISIC, these are included under this sector, as these are all considered primary activities. Farming of animals is covered under NIC98 code 012.
- 9.2 According to NIC-1998, the agriculture sector includes agriculture, hunting and related service activities. The economic activities included in the sector are (i) growing of cereals and other crops n. e. c; growing of vegetables, horticultural specialties and nursery products; growing of fruit, nuts, beverage and spice crops. (ii) farming of cattle, sheep, goats, horses, asses, mules and hinnies; dairy farming (includes stud farming and the provision of feed lot services for such animals); other animal farming; production of animal products n.e.c.. (iii) growing of crops combined with farming of animals (mixed farming). This class includes crop growing in combination with farming of animals such as sheep or meat cattle at mixed activity units with specialization ratio in either one of less than 65 percent. (Mixed cropping or mixed livestock units are classified according to their main activity). (iv) agriculture and animal husbandry service activities, except veterinary activities. (This class includes specialized activities, on a fee or contract basis, mostly performed on the farm). (v) hunting, trapping and game propagation including related service activities. These are covered under NIC98 codes, 011, 012, 013, 014 and 015. The livestock and livestock products include breeding and rearing of animals and poultry besides private veterinary services, production of milk, slaughtering, preparation and dressing of meat, production of raw hides and skins, eggs, dung, raw wool, honey and silk worm cocoons and increment in livestock. Although the production of meat and meat products, by-products are covered under the manufacturing sector in the ISIC, these are included under this sector, as these are all considered primary activities. Farming of animals is covered under NIC98 code 012.
- 9.3 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 and deducting there from the value of inputs of raw materials and services consumed in the process of production at purchasers' prices. In respect of operation of irrigation system by government sources, income approach is used. The gross factor income generated as a result of providing irrigation services is estimated. The operation of irrigation system by the agriculturists is not separately taken into account as its output gets reflected in the value of output of crops and the expenditure on its operation in the overall input costs.
- 9.4 Directorate of Economics & Statistics, Agriculture (DESAg), in the Ministry of Agriculture is the prime source for agricultural statistics used for the estimation of GVA. The information used for purposes of building up the estimates are (a) the Land Use Statistics (LUS), (b) Area and Out turn of Principal Crops, and (c) Cost of Cultivation Studies.
- 9.5 *Land Use Statistics:* Statistics on land utilisation flow as by-product of a normal activity of the State Revenue Departments, collecting various data for administrative needs of land revenue collection. DESAg

Methodology of GVA estimation

Sources of data

OUTPUT

Agriculture production

publishes these statistics in their annual publication entitled "Agriculture Statistics in India". Detailed statistics of land utilisation which mainly give classification of land put to various uses are continuously available since 1884, though over the period, scopes as well as geographical coverage of statistics have been gradually expanding. Complete LUS are available at present for about 93 per cent of the geographical area. Statistics for nearly 86 per cent of the reporting area are based on complete enumeration, 9 per cent of the area on sample surveys and the remaining 5 per cent of the area on ad-hoc basis. DESAg releases estimates of area in mimeographed form under the titles (i) "Land Use Classification and Irrigated Area", (ii) "Area Irrigated Source-wise and Crop-wise", and (iii) "Area under Crops". However, these are released with a time lag of one year.

- 9.6 *Area and Outturn of Major and Minor Crops:* Periodic estimates of area and outturn of major crops generally known as forecast crops initially prepared by the State agencies are consolidated by the DESAg and issued in the form of crop estimates. For major crops, before the final forecast giving the estimates of area and production, four advanced estimates are issued on the basis of condition of the crop at various stages etc. These forecasts are designed to indicate the main features of the crop at various stages of its growth. The estimates for these purposes are derived from variety of sources, which include Timely Reporting Scheme (TRS), advance estimates given by the States and the reports furnished by the marketing intelligence offices of the DESAg located in different States. In arriving at the level of anticipated production, consideration is given to (i) rainfall and weather conditions, (ii) consumption/off-take of fertilisers, credit etc., (iii) expansion in area under high yielding varieties, (iv) condition factor which indicates the yield expectation, and (v) reports received from the Inspecting Officers in the States. The final forecast estimates containing both area and production for the entire Major and Minor crops are released by the DESAg with a time lag of 4 to 5 months after close of the agricultural year. Revised estimates of production, based on complete coverage of area and yield through Crop Cutting Experiments (CCE) conducted by the respective State Governments, of the preceding year are released along with the final forecast estimates of the year.

9.7 The DESAg has divided crops into two groups' viz., major and minor crops. Major crops (25) are: Paddy, Wheat, jowar, bajra, maize, ragi, barley, small millets, gram, tur, other kharif pulses, other Rabi pulses, groundnut, sesamum, rapeseed and mustard, linseed, castor seed, safflower, niger seed, soybean, sunflower, cotton, jute, mesta and sugarcane. Minor crops (17) are non-forecast crops. These are potato, onion, banana, tapioca, sweet potato, pepper, ginger, garlic, chillies, turmeric, arecanut, coriander, cardamom, sun hemp, tobacco, guar seed and coconut. The estimates of forecast and non-forecast crops are available at the State level. For forecast crops, four advance estimates, final and fully revised estimates are available whereas for non-forecast crops, only two estimates final and fully revised estimates are available.

9.8 Data on wholesale and retail prices collected on weekly basis by the DESAg are published in their (a) Bulletin of Agricultural Prices (weekly), (b) Wholesale Prices of Food grains (weekly), (c) Agricultural Prices in India (annual), and (d) Agricultural Situation in India (monthly). These prices are mostly collected under their marketing intelligence schemes. The centres selected for collection of wholesale prices are distributed all over the country.

9.9 *Cost of Cultivation Studies (CCS):* For the purpose of obtaining estimates of cost of cultivation of major & minor crops, a comprehensive scheme was initiated by DESAg in 1970-71. The scheme envisaged collection of representative data on inputs and outputs in physical and monetary terms and estimating there from the cost of cultivation per hectare and cost of production per quintal of the major crops. The important items for which data is collected through the CCS are (i) Quantity of seed rate by crops per hectare (ii) Value/quantity of by-products by crops per hectare, (iii) Consumption of diesel, mobile oil and grease per tractor/pump set in quantity and value terms, (iv) Utilisation of milk & milk products including details on conversion, (v) Electricity consumed both in value and quantity terms, (vi) Fodder fed to animals (green as well as dry), (vii) Concentrate fed to draught animals, (viii) Cost of insecticides & fertilisers, (ix) Repairs & maintenance expenses of farm machinery, and (x) Marketing expenses including transportation

costs to the nearest market/mandi. Data available in respect of items like electricity, insecticides, fertilisers etc., are not utilised as better and more reliable data on such items are available from sources like Central Electricity Authority (CEA), Fertiliser Association of India (FAI), Pesticides Association of India (PAI) etc.

9.10 **Other sources:** These are Tea Board, Coffee Board, Rubber Board, Directorate of Arecanut and Spices Development, Directorate of Cashewnut and Coca Development, Central Bureau of Narcotics, Directorate of Marketing and Inspection (DMI), National Horticulture Board (NHB), National Sample Survey Organisation (NSSO), Directorate of Sugar and Department of Food and Public Distribution of Ministry of Consumer Affairs, Food and Public Distribution, apart from various studies conducted by the Agro Research Centers and State's Directorate of Economics and Statistics (DES) and Central Statistical Organisation. The use of these data is discussed in the estimation of output at current prices.

Livestock Production

9.11 **Integrated Sample Survey:** Recognising the need and importance of reliable and comprehensive data on various aspects of livestock including production of livestock products on a regular basis, the Government of India initiated a centrally sponsored scheme during the Fifth Five Year Plan called Integrated Sample Survey (ISS). The scheme envisaged establishing the statistical cells in the Animal Husbandry Directorates of various States and Union Territories for the purpose of conducting sample surveys for the estimation of livestock products and carrying out other statistical activities. State-wise sample surveys on estimation of production of major livestock products were taken up in 1976. The detailed data collected include recording of milk yield of the selected animals, feed consumption of bovines, particulars such as breed, number of lactations completed, production and disposal of milk and milk products; production and disposal of dung and study of bovine practices; production, purchase and disposal of eggs, feed supplied to poultry birds, their diseases, deaths and disposals and breed composition etc., and study of poultry practices; sheep number and wool production in the selected flocks, pattern of disposal of

wool, feeding and grazing practices of sheep and their diseases, deaths and disposals and study of sheep practices; and number of animals slaughtered according to species, breed and age on the day of visit, live weight and carcass weight after slaughter in the case of meat production.

9.12 The Government of India also constituted a Technical Committee of Direction (TCD) for improvement of animal husbandry and dairying statistics in the country. The committee has on it, members representing various statistical organisations at the Centre and in the States, besides subject specialists in the field of animal husbandry. The objective of the committee is to (i) identify the important data gaps, (ii) propose relevant statistical schemes for collection, analysis and dissemination of information, (iii) evolve suitable statistical methodologies, and also (iv) provide approval from time to time for the release of results at the State/National level. The TCD is responsible for finalisation of production estimates of milk, meat egg, and wool. The production estimates of these items available State wise through the ISS are examined rigorously by the TCD for their consistency over the years and by taking into consideration the other aspects like climatic factors etc., which contribute towards their production. However, for any particular state, if the survey results are not available then the ad-hoc estimates of production prepared by the State Animal Husbandry Departments are substituted.

9.13 With the introduction of ISS and with the efforts of the TCD, the Ministry of Agriculture releases regularly state-wise and all India production estimates of milk, meat, egg and wool. However, still there are problems with regard to the meat production estimates from unregistered sector. The data is published in annual publication titled 'Basic Animal Husbandry Statistics' of the Department of Animal Husbandry and Dairying, Ministry of Agriculture.

9.14 **Indian Livestock Census:** Indian livestock census (ILC) conducted quinquennially is the main source of data on livestock. This provides age-wise and sex-wise data at the district level on a number of different categories of animals separately for urban and rural areas. The estimates for inter-censal and post-census years are arrived at on the basis of compound growth

rate observed for each category between two consecutive censuses. The latest i.e., 17th Indian livestock census (ILC), was conducted in 2003. 9.18

- 9.15 **Other sources:** The data is also collected by different agencies like State Animal Husbandry Departments, Directorate of Marketing and Inspection (DMI), NSSO, Central Silk Board, Khadi and Village Industry Commission (KVIC) and ad-hoc surveys. The information culled from these sources is used for preparing the estimates of production of poultry meat, meat by-products, silk worm cocoons, honey etc.

INPUTS

- 9.16 **Fertiliser Statistics:** Fertiliser Association of India (FAI) is publishing data pertaining to state wise dispatches of fertilisers made by the Central Fertiliser Pool, Indian Potash Ltd. and other domestic manufacturers both material wise and nutrient wise in the publication "Fertiliser Statistics". Figures pertaining to pool dispatches are collected by the FAI from the Departments of Agriculture of the various states and mainly relate to imported nitrogenous and complex fertilisers. However, as regards non-pool fertilisers, the data relate to indigenous material. The total figures of dispatches to various states are arrived at after combining the figures from the pool and non-pool handling agencies. The estimates of state-wise consumption of chemical fertilisers are also published nutrient wise, which are collected by the FAI from the State Agriculture Departments. However, these estimates are not very reliable and it has been observed that generally the annual consumption of fertilisers has been more than the distribution. 9.19
- 9.17 **Other sources:** The CCS provides information on different inputs. In addition, data from different sources are used to estimate the value of other inputs. These include NSSO, Indian Agricultural Statistics Research Institute (IASRI), All India Debt and Investment Survey (AIDIS), DMI, Integrated Sample Survey (ISS), Pesticide Association of India (PAI), Central Electricity Authority (CEA), State Revenue/Irrigation Departments, etc.

Estimates at current prices Outturn of agricultural crops

Classification: The valuation of agricultural crops are divided into 11 groups, the first ten crop groups are made according to classification of area under crops of Land Use Statistics. It matches with the classification followed for principal crops by Ministry of Agriculture. The last group is by-products of agricultural crops, covered under 10 crop groups. These groups are:(1) Cereals, (2) Pulses, (3) Oilseeds, (4) Sugar, (5) Fibers, (6) Drugs and Narcotics, (7) Dyes and Tanning, (8) Condiments and Spices, (9) Fruits(fresh and dry) and Vegetables (including floriculture and Kitchen garden), (10) Miscellaneous crops, and (11) By-products. The groups (1) to (10) is classified on the basis of Land Use Classification, the last group i.e., by products includes Gur production and bagasse also, as these activities are performed in farms; whereas straw and stalks and sticks are the remnants of the crops. The list of crops under each of these groups is given in Appendix 9.1

Outturn of crops: The estimates of area and outturn 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, (8) Condiments and Spices (9) Fruits and Vegetables and (10) Miscellaneous crops, at State level are regularly obtained from the DESAg. The estimates of area and outturn 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 Coca 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. 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. Data on total quantity of raw tea leaf together with its value are obtained from the Annual Survey of Industries (ASI). However, in the absence of

the ASI results 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 recent study conducted by the DES, Assam. 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.

- 9.20 **Toddy:** Toddy crop, a beverage, has now been included. NSSO Publication entitled "Consumption of some important commodities in India 1999-2000" (National Sample Survey, 55th 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.
- 9.21 **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.
- 9.22 **Foreyard and Backyard farming (Kitchen garden):** This 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. The report provides the percentage distribution of operational holdings reporting different types of agricultural production for broad size class of operational holdings, separately for "agricultural production in homestead only" and "outside homestead raising field crops". Under the category "agricultural production in homestead only" the items covered in the Table are (i) poultry (ii) livestock with or without poultry, (iii) kitchen garden and (iv) any other combination. It has also been clarified in the Report that "Homestead may constitute only a part of a plot. Sometimes, gardens orchards or plantations, though adjacent to the homestead and lying within the boundary walls, may be located on a clearly distinct piece of land. In such cases, land under garden, orchard or plantation was not considered as homestead land". For deriving the value of output from kitchen garden in the 1993-94, the data available on (iii) above only has been used, although a part of (iv) may also being used as kitchen garden. Since the operational holding used for kitchen garden includes the area occupied by the residential building, an area of 0.01 ha. per holding has been subtracted from the total area estimated to be used for kitchen garden. 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. Since the Report covers only rural sector, the estimated value of output on account of kitchen garden also refers to the kitchen garden in rural areas only. 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.
- 9.23 **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 1999-00 series production is taken from NHB and the prices from the respective State DESs.
- 9.24 **Miscellaneous crops:** Miscellaneous 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.
- 9.25 **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. These rates were based on NSS

1955-56 report. The value of these rates and ratios used by the National Commission on Agriculture (NCA, Vol II, 1976) and Feed & Fodder Committee of the Ministry of Agriculture (1974) were adopted. For the New series, these rates are revised on the basis of the recent study conducted by the Socio-Economic Research Centre, which are as under:

Yield of cultivated Green Fodder

- 50 tonne/hect. for Irrigated Land
- 25 tonne/hect. for Un-irrigated Land

9.26 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.

9.27 **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 utilised 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 built up using information on quantity of sugarcane used for various purposes. The information on utilisation 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.

9.28 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 22.5 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. The institute has informed that the ratio of production of bagasse is 30-40 percent of gur production. The rate used for estimating production of bagasse was 22.5% of gur production in old series. Now it has been revised to 35% of Gur production in new series.

9.29 **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 CCS. The value per unit area of the by-products available from the CCS is directly utilised for arriving at the value of output.

Output of livestock and livestock products

9.30 **Classification:** For purpose of estimation of value of output, the livestock products are divided into 7 broad groups viz., (i) milk, (ii) meat group, (iii) eggs, (iv) wool and hair, (v) dung, (vi) silk worm cocoons & honey, and (vii) increment in livestock. The list of products under each of these groups is given in the Appendix 9.3.

9.31 **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) as mentioned earlier. 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 neighbouring 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.

9.32 **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 and furnish the same to the CSO.

9.33 **Meat products and by products:** 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. The old yield rates have been updated using the results of the study conducted by the CSO in 6 states during 2004-05, indicated below:

Product / By-Products	New Average Yield Rates (Kg.)		
	Cattle/ Buffalo	Goat/ Sheep	Pig
Edible offal, glands	4.44/5.09	0.71/0.57	1.574
Heads	5.89/7.31	0.813/0.72	3.485
Legs	4.89/6.09	0.501/0.49	1.042
Fats	4.81/8.97	0.289/0.16	3.003
Esophagus	0.21/0.31	0.073/0.03	0.185
Blood	8.28/8.84	0.769/0.49	2.267
Tail stumps	0.88/0.68	-	-
Bones	11.83/14.31	-	-
Guts	3.39/4.22	0.642/0.76	2.031
Horns	0.54/1.28	0.075/0.05	-
Hoofs	0.35/0.34	0.60	0.157
Useless meat	2.97/6.56	0.348/0.20	0.799

9.34 **Eggs & poultry meat:** The data on production of egg 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 utilisation of eggs 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.

9.35 **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.

9.36 **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 utilisation rates of dung for (i) dung used as manure and (ii) dung used as fuel is supplied by the (DAHDF), Ministry of Agriculture.

9.37 **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.

9.38 **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 is projected on the basis of growth rates observed between the two previous Livestock Censuses. At the time of release of the new series, detailed data on livestock census, 2003 was not available.

Valuation of Output

9.39 Conceptually the farm-output needs to be evaluated at a price which measures, as accurately as possible, the income which

accrues to the producer. For this purpose either the average price of a commodity at the point of production or at the first point of sale by the producer could be used. The price at the point of production is the average wholesale price at which the commodity is disposed off by the producer at the village site during the specified peak marketing period, i.e., the period immediately following the harvesting of a crop wherein the bulk of the produce is disposed off. Ideally the portion of the produce which is disposed off during a specified marketing period, at the farm site itself should be valued at farm harvest prices and that which is disposed off in the primary markets should be valued at the wholesale prices prevailing in the primary markets with due adjustments for market charges and transport expenses wherever necessary.

9.40 In the case of relatively developed states where the producers have capacity to hold back a substantial portion of their produce and dispose it off at higher prices during the off-season, the use of prices prevailing during the peak marketing period may result in serious under-estimation of the income accruing to the agriculture sector. In such cases, ideally, there should be a system of using the weighted average of the season and off-season prices for evaluation purposes. It may be observed that the farm harvest prices are collected on a regular basis only in the case of few states. The data for other states are collected only from a few selected centres. However, a reassessment of the current condition indicates that the bulk of the transactions actually take place during the peak marketing period rather than during the harvest period, there being a time lag of 1 to 2 months between the two periods. Due to these considerations, crop wise average wholesale prices prevailing in the primary markets during the peak marketing periods are being used for valuing crop outputs at the state level.

9.41 The wholesale prices are collected by the agricultural produce marketing committees, State Agricultural Departments or by the State DESs under the market intelligence scheme of DESAg. For averaging the weekly wholesale prices available from the selected primary markets, the following procedure is adopted:

- Arithmetic averaging of the prices at the various centers within a district is done to get the weekly district prices.
- Average price for a district is worked out as the arithmetic average over the "peak marketing period" of weekly prices obtained above.
- State average price is obtained as a weighted average of the district wise prices, with weights being the district wise production of the corresponding crops.

9.42 The average prices are used along with the production estimates available from DESAg for obtaining the value of output. In the absence of current price for any crop in a state, the trend observed in the prices of the crop in the adjoining state is used to estimate the current price. The portion of the production retained by the producer for self consumption, seed, livestock feed etc., is evaluated at the average prices arrived at above. However, the quantity procured by the central and state government agencies is evaluated at procurement prices obtained from the Ministry of Consumer Affairs, Food and Public Distribution.

9.43 For some principal crops and most of the minor crops, the corresponding district level production and prices are generally not available. The source material and the methodology followed in such cases are discussed in subsequent paragraphs.

9.44 For small millets, the average price is taken as 75 per cent of the weighted average prices of jowar, bajra, barley, maize and ragi. This relationship between the prices of small millets and cereal crops has been observed from the price situation available in the case of Madhya Pradesh and Uttar Pradesh which are the principal producing states for small millets and where detailed price data for most of the crops falling under this group are available. The average price for 'other pulses' is taken as 85 per cent of the weighted average prices of arhar, Urad, Moong, Masoor and Horse-gram on the basis of data on production and prices available for Bihar and Madhya Pradesh States.

9.45 For crops like banana, mango, citrus fruits and grapes no production data at the district level are available. Therefore, a simple average of the district prices is taken as the state average price. In the case of Arecanut,

wholesale prices obtained from the Directorate of Arecanut & Spices Development are deflated by 20 per cent to obtain the producer price of raw Arecanut.

- 9.46 For opium, prices paid to the growers are obtained from the Central Bureau of Narcotics. For raw rubber, the price of sheet rubber prevailing in the Kottayam market of Kerala is used after deflating the same by 28 per cent on the basis of information contained in the Plantation Enquiry Commission Report on Rubber. This allowance is towards the processing charges which are involved in the production of sheet rubber.
- 9.47 As mentioned earlier, for unspecified crop groups, the estimates of outturn are not available. The value of output of unspecified crop groups is obtained by applying an appropriate average value of yield per hectare to the total estimated area under each of these crop groups. The average value of yield per hectare for each unspecified crop group is arrived at from the weighted average value of yield per hectare of crops contained in that group. For example the average value of yield per hectare of 'other cereals' (other than small millets) is worked out as the weighted average value of yield per hectare of jowar, barley, bajra, maize and ragi.
- 9.48 The value of by-products is estimated directly from the results of the CCS.
- 9.49 The prices of livestock and livestock products are obtained from the same source as those for agricultural commodities. Wherever possible, special returns are obtained by State DESs to ensure a reasonable coverage of statewise prices of important livestock/livestock products. The statewise prices are worked out as the simple arithmetic average of all available price observations. As in the case of agriculture, if, in any year price of a product is not available for a given state, the price trend/actual price prevailing in an adjoining state is adopted. Since these wholesale prices relate mostly to urban centres, these are adjusted to conform to the rural prices using the urban/rural price differentials.
- 9.50 For arriving at the GVA from agriculture and livestock sector, necessary deductions are made from the value of output for
- intermediate consumption. The various items that are considered as items of intermediate consumption i.e., inputs in this sector are (i) seed, (ii) chemical fertilizers, organic and inorganic manure (iii) livestock feed, (iv) irrigation charges (payable to the government), (v) market charges, (vi) electricity, (vii) pesticides and insecticides, (viii) diesel oil, (ix) current repairs & maintenance of fixed assets and other operational costs, and (x) financial services indirectly measured (FISIM) or imputed bank charges.
- 9.51 **Seed:** Data on seed rates (quantity per hectare) are available from the CCS organised by the DESAg as well as from the State Agricultural Departments for principal crops and some minor crops. These data are supplemented wherever necessary by data contained in the relevant Marketing Reports and other sources. Prices used for the evaluation of output are used to arrive at the value of seed used as input.
- 9.52 **Manure:** The manure consists of dung (organic) manure and inorganic manure viz., chemical fertilisers. No separate estimates of consumption of organic manure are prepared except that of dung manure. It is assumed that the output of dung (other than that used for making dung cakes for fuel purposes) of the animal husbandry is used as input in the agriculture sector. The estimates of consumption of chemical fertilisers are based on the material wise distribution of chemical fertilisers to States by the Central Fertiliser Pool, Indian Potash Ltd., and the domestic manufacturers. Pool distributes imported nitrogenous and complex fertilisers and domestic manufacturers market the indigenous material. These data do not include the stocks with the traders. Hence, there is an implied assumption that the consumption of chemical fertilisers in a particular year is equivalent to the quantity distributed. The consumption of chemical fertilisers is evaluated at retail prices available from the same source.
- 9.53 **Livestock feed:** The feed consumption of animals used for cultivation activities as well as production of livestock and livestock products, is considered as input. Livestock feed comprises of (i) roughages, (ii) concentrates including salt, medicines and other miscellaneous feed. Roughages include cane trash, grass, fodder, stalks, straw etc.,

Inputs

while concentrates are made up of oil cakes, crushed pulses, grains, grams, rice bran, husk, oil seeds, gur etc.

- 9.54 As regards roughages, the entire production of fodder, cane trash and grass and 95 per cent of production of stalks and straws in the agriculture sector are considered to be consumed by entire livestock population. An adjustment is made for the consumption of these items by animals which are not used in agriculture sector viz., bullocks, horses, and camels etc., mainly used for transportation purposes. Stalks and straws and cane trash are the by-products of the corresponding food grain crops and sugarcane.
- 9.55 The estimates of concentrates fed to livestock are largely based on the feed rates collected under the 30th Round of NSSO, 1975-76. The NSS Report No. 281 "Some Aspects of Production of Livestock Products and Related Characteristics", 30th round, 1975-76 provides statewise estimates of quantity of concentrates consumed per day per cow & buffalo in milk for the year 1975-76. From the NSS Report No. 288 "A Note on Some Characteristics of Household Dairy Enterprises", 30th round, 1975-76, it has been possible to obtain statewise estimates of the quantity and hence the percentage of the different components of concentrates fed to cattle and buffaloes in milk. These data used in conjunction with the relative consumption rates of other categories of cattle and buffaloes as provided by the results of the studies/surveys undertaken by IASRI/State Animal Husbandry Departments make it possible to estimate the rates of consumption of concentrates fed to all the categories of bovines used for cultivation and livestock purposes for the year 1975-76. The NSS Report No. 288 also provides data on value of different components of concentrates for the year 1975-76. The information on value and quantity provided by this report is used to estimate corresponding prices. The corresponding prices for the subsequent years are obtained with the help of movement of prices of the relevant agricultural crops.
- 9.56 A small percentage of the total concentrates fed to livestock relates to other animals like goats, sheep, pigs etc. The consumption of concentrates fed to goats and sheep are estimated from the IASRI study "Cost of Production of Sheep Wool in Himachal Pradesh". From this report it is possible to derive the annual consumption of concentrates for goats and sheep. The same norms are assumed for all states in the absence of any other data. Concentrates consumed by goats and sheep for the current year are estimated by projecting the benchmark estimates on the basis of the number of animals projected from the ILCs. The total consumption of concentrates is then split up into different components according to the details available in the above mentioned IASRI study. In the case of pigs no survey results are available and in the absence of such data, the overall average value of consumption relating to goats and sheep is taken.
- 9.57 Poultry feed is estimated from the consumption norms derived from the data available from studies/surveys of egg production and poultry practices carried out in Gujarat, Maharashtra, Punjab and Uttar Pradesh. The concentrates in the case of poultry include grains and ready-made feed. The overall consumption norm based on the surveys referred to above is being used for all other states. The total consumption of concentrates is estimated by using the estimated number of poultry from the ILCs. The quantity thus estimated is split-up into grains and ready-made feed on the basis of the above mentioned reports. The quantity of grains are valued at prices used in the estimation of value of output and the value of ready-made feed is moved to later years using wholesale price index.
- 9.58 **Irrigation charges:** Annual data on irrigation charges payable to the government in lieu of water supplied to the farmers from government owned canals and other means of irrigation are received from the DESs' which are collected by them from the respective irrigation departments. The items on which information is being collected are (i) sale of water for irrigation purposes, (ii) irrigation cess, (iii) local cess on water charges, (iv) betterment levy, and (v) other items. However, if a state fails to provide this information, estimates based on budget analysis are substituted which include other receipts also which do not form part of the irrigation charges viz., sale of water for domestic purposes, sale of water for other purposes, sale proceeds from canal plantation, navigation etc.

- 9.59 **Market charges:** The estimates of market charges are prepared separately for agriculture and livestock production. In the revised series no change has been made in the methodology of market charges of livestock production. Market charges in respect of meat are estimated on the basis of MR on meat, where the charges per animal are available.
- 9.60 For estimating the market charges paid by the farmers, the CSO conducts a study through the DESAg, Ministry of Agriculture at the time of revising the base year. The rate used in the 1993-94 series was 1.29 per cent of value of output of agricultural crops. This rate was based on the study conducted by the DESAg, during 1997-98, and was limited to two crops, paddy and wheat. However, the Ministry of Agriculture's recent study on this was extended to 8 crops, namely, paddy, wheat, maize, gram, ginger, mango, potato and onion.
- 9.61 It has been found that the percentage of market margins and market costs to the total value of output of 8 crops is 2.358 as against 1.29 used in 1993-94 series. The percentage of market charges to the value of output thus obtained is assumed to remain constant over the years until it is revised.
- 9.62 **Electricity:** Data on electricity consumed for agricultural purposes and its corresponding price per unit are obtained from the CEA on an annual basis, at state level.
- 9.63 **Pesticides and insecticides:** Estimates of consumption of pesticides and insecticides both in terms of quantity and value are available upto the year 1982-83 at national level from the Crop Care Foundation of India formerly known as Pesticides Association of India. For later years only the consumption in quantitative terms is made available, therefore the current value of consumption is estimated by using the 1982-83 price adjusted for change in wholesale prices of pesticides and insecticides. The all India estimate, which is distributed amongst states using the statewise distribution of pesticides (in terms of technical grade), is available on an annual basis from the Directorate of Plant Protection and Quarantine, Ministry of Agriculture.
- 9.64 **Diesel:** The data on consumption of diesel is estimated from the number of tractors and diesel engines in use and per unit consumption of diesel. The data on the number of tractors and diesel engines used in agriculture is estimated through the ILC. The norms of consumption of diesel per tractor/diesel engine are based on the information collected from the schedules of CCS available annually.
- 9.65 **Repairs and maintenance and operational costs:** Fixed assets employed in this sector for the purpose of production can be classified into (i) agricultural implements, machinery and transport equipments, (ii) farm houses, barns (grain golas) and cattle sheds, (iii) orchards and plantations, (iv) bunding and other land means, (v) wells, (vi) other irrigation resources etc. The estimates of expenditure on current repairs and maintenance for all these categories except for agricultural implements and machinery have been prepared both for rural and urban areas for the year 1991-92 using the data from AIDIS. The expenditure so obtained has been moved to the preceding and subsequent years by the index of cost of rural/urban 'other construction works', prepared specially for this purpose for getting the estimates at current prices. In the case of agricultural machinery and implements, the point estimate on expenditure on repairs and maintenance for the year 2002-03, obtained from AIDIS, has been moved backward and forward with the help of value of products and by-products of this group.
- 9.66 The operational costs of livestock products cover current expenditure on production of milk, hides & skins, eggs & poultry, wool & hair, honey and silk worm cocoons. Based on the limited data available on such expenditure, operational costs of production of these products are estimated at the rate of 0.25 per cent of corresponding value of output.
- 9.67 **Gross value added**
The estimates of GVA are arrived at by deducting the total value of intermediate consumption from the value of output of this sector and then adding to it the GVA from government irrigation system. The GVA from the Operation of Government Irrigation Systems (OGIS) is obtained by income approach method i.e. by taking the sum of compensation of employees, operating surplus gross of provision for CFC, the details of which are available from the Central and State Government budgets. Appendix 9.7 & 9.8 give the value of output from agriculture,

the value of output from livestock and the GVA from the sector as a whole respectively.

Estimates at Constant Price

9.68 For estimation of value added at constant prices, the double deflation method is used wherein various items of output and input are estimated at the base year prices. In a given year, the base year price data viz., the state average price, value of yield per unit of area etc., are used wherever applicable and a method similar to that at current prices is followed to obtain the value of output at constant prices.

9.69 In the case of inputs where quantity data are available, these are evaluated at base year prices. In the case of pesticides and insecticides for which only value estimates are available, the constant price estimates are arrived at by deflating the current price estimates using the relevant index number of wholesale prices of pesticides. The estimates of irrigation charges at the constant price are obtained by projecting the base year estimates by the trend in area irrigated by government sources. In the case of operation of irrigation system, area under irrigation by government canals has been used as an indicator to carry forward the component of the wages and salaries of the staff of the base year to obtain the corresponding estimates at constant prices.

Quality and limitations of data base

9.70 Periodic estimates of 42 (Major and Minor crops) crops are issued by the DESAg in the form of Final Forecast, which are available 4-5 months after the close of the agriculture year. Along with final forecast figures, revised estimates for the preceding year are also published. However, for some of the crops in some states, final forecast figures are not available in time, as such there are revisions in the output data when the fully revised estimates are released one year later. For horticulture crops, periodic estimates are issued by National Horticulture Board (NHB), which are at variance with those released by State DESs / State Departments of Agriculture/Horticulture. For unspecified crops like 'other oilseeds', 'other cereals', 'other fruits and vegetables' and 'other condiments and spices' etc., only area figures are available on an annual basis. The value of output of these crop groups are, therefore, estimated on the basis of area and output of

related major crops/crop groups. DESAg supplies the final LUS with a time lag of 1 to 2 years. The estimates for these crop groups are, therefore, comparatively less reliable. However, it may be mentioned that their contribution in the value of output is quite small. The estimates of production of plantation crops like tea, coffee, cardamom, arecanut, cashew nut, cocoa and rubber are directly obtained from the respective Boards on an annual basis. These are estimated by the Boards on the basis of the returns received from the growers.

9.71 Wholesale prices prevailing in the primary markets averaged over the peak marketing period are used for evaluating the production. These prices are usually collected by Agricultural Produce Market Committees and the State Agriculture Departments as well as the State DESs. The data on prices collected by the state governments become available from the State DESs to the CSO with a time lag of about 1-2 years. Usually, state average price data for the crops is not available at the time of compilation of Quick Estimates of national income, as such these estimates are prepared only at national level, using the trends observed in the wholesale price index of respective crops. However, the price data available from the State DESs cover almost all crops which form about 95 per cent of the total output and are considered to be reliable.

9.72 The farm output should conceptually be evaluated at prices which accrue to the producer at the first point of transaction. In practice, however, this is not possible as the producer disposes the product at different stages. The more important of these are (i) sales at village farm site, (ii) sales at nearby and distant markets at different points of time, and (iii) retentions for consumption and other uses like seed, feed etc., in the producer households. The ideal way would be to evaluate transactions at each stage of disposal, at the corresponding price but little information is available to make this possible. Studies, however, show that the disposal of product by producer households is largely in the primary markets during peak marketing periods. Evaluation of output at state average prices worked out as weighted average of district level prices during peak marketing period is, therefore, considered to be the most appropriate under the present circumstances. Further, the produce retained

by farmers need to be valued at farm harvest prices conceptually. However, due to lack of data these retained produce are also valued at the state weighted average prices.

- 9.73 Results of ILC, provide age-wise, sex-wise and breed-wise population at the district level for different categories of animals. However, annual data on livestock population is estimated using inter-censal growth rates, which may not take into the conditions, such as drought, floods, etc. prevailing in either of the census years. The estimates of main products viz., milk, egg and wool are obtained from Ministry of Agriculture. These estimates are based on yield rates as well as population evolved through ISS, scientifically planned sample surveys, conducted by the State Animal Husbandry Departments. These surveys are conducted in an objective manner and provide reliable estimates of yield rates. Production of meat of different categories of animals is prepared using the data obtained from the State Animal Husbandry Departments. These estimates suffer from inherent limitations as these do not cover unregistered sector. More over these do not estimate poultry meat, which is estimated through indirect methods.
- 9.74 The estimates of the value of inputs are prepared by using the various sources like CCS, FAI, NSSO, IASRI, State/UT DES, DESAg, CEA, PAI, State Animal Husbandry Departments and AIDIS. The estimates of seed, diesel oil and by-products of agriculture crops are based on the results of the CCS. CCS data are based on 9000 agriculture
- holdings. The results of such studies may be representative for all India but using the same at state level may not be correct. In the case of chemical fertilisers, it is assumed that whatever is distributed by the pool and non-pool agencies is consumed. This assumption may not be true but in the absence of any data on stocks there seems to be no other alternative. The concentrates used in the livestock feed are estimated from the NSSO survey results of the 30th round. These results pertain to the year 1975-76 and may not be relevant for the later years. In respect of grass, the estimates of livestock feed are based on the NSSO report which pertains to 1955-56. The data on consumption of organic manure are not available and so the output of dung manure in animal husbandry sector is taken as input of agriculture sector. AIDIS form the main source of information for preparing estimates of repairs and maintenance charges. These surveys are, however, conducted once every ten years and then the annual estimates suffer due to the non-availability of satisfactory annual indicators. The CSO updated a number of rates and ratios in the current series through conduct of type studies in various states. However, few rates and ratios are still old.
- 9.75 The estimates of hunting, trapping and game propagation are found to be insignificant with the available data. However, hunting and trapping is a banned activity, therefore, reliable data are not available on the same.

LIST OF AGRICULTURAL CROPS

Crops classification		
Agricultural crops		
<i>Group</i>	<i>Principal crops</i>	<i>Crops covered in LUS</i>
1. Cereals	Paddy, wheat, jowar, bajra, barley, maize, ragi and small millets	Paddy, wheat, jowar, bajra, barley, maize, ragi, small millets and other cereals and millets
2. Pulses	Gram, arhar, other kharif pulses and other rabi pulses	Gram, tur and other pulses
3. Oilseeds	Linseed, sesamum, groundnut, rapeseed & mustard, castor seed, coconut, safflower, Niger seed, soyabean, and sunflower.	Linseed, sesamum, groundnut, rapeseed & mustard, castor seed, coconut, safflower, Niger seed, soyabean, sunflower and other oilseeds.
4. Sugars	Sugarcane	Sugarcane and other sugar
5. Fibres	Kapas, jute, sun hemp, mesta	Kapas, jute, sun hemp, mesta other fibres
6. Drugs & Narcotics	Tobacco, tea and coffee	Opium, tobacco, tea coffee, rubber (classified under misc. crops) and others
7. Condiments & Spices	Cardamom, dry chillies, garlic, black pepper, dry ginger, turmeric, coriander and Arecanut	Cardamom, chillies, garlic, black pepper, ginger, turmeric, Arecanut and others
8. Fruits & Vegetables	Banana, potato, sweet potato cashew nut, tapioca, and onion	Mango, citrus fruits, banana, grapes, pome fruits, papaya, other fresh fruits, cashew nut, other dry fruits, potato, tapioca, sweet potato, onion, other vegetables
9. Dyes and tanning material		Indigo and others
10. Miscellaneous and unspecified crop groups	Guar seed	Fodder crops, green manure crops and other non food crops
11. By products		

VALUE OF OUTPUT OF AGRICULTURAL CROPS-DATA SOURCES

S.NO.	GROUPS	SOURCES OF DATA
1	Cereals: Paddy, Wheat, Jowar, Bajra, Barley, Maize, Ragi & Small Millets and other cereals	Production and Area: Directorate of Economics and Statistics (DES), Ministry of Agriculture (M/o Ag) in respect of principal crops. Area under other crops is obtained from LUS and state DESs. Prices: State DESs
2	Pulses: Gram, Moong, Tur, Moth, Horse Gram, Masoor, Urad, peas etc. and other pulses	Stated at (1) above.
3	Oil Seeds: Linseed, Groundnut, Rapeseed and Mustard, Sesamum, Castor seed, Coconut, Safflower, Niger seed, Soyabean, Taramira Sunflower and other oilseeds	- do -
4	Sugar: Sugarcane, palmyra, Gur other sugar	Gur production= 9 to 10% of sugarcane used for gur making (total sugarcane production-cane crushed by factories-used for seed-used for chewing-cane used for khandsari)
5	Fibres: Kapas, Jute, Sunhemp, Mesta, other fibres	Stated at (1) above.
6	Indigo dyes and tanning material: Indigo, other dyes and tanning material	State DES of Tamilnadu and Rajasthan for production and prices, LUS for area under other dyes etc.
7	Drugs & Narcotics: Tobacco, Tea, Coffee, Opium, Betel leaves, Isabgol, Saffron, Coca, other drugs & narcotics.	Tea Board, Coffee Board, Cashewnut & Coca Development Board, Central Bureau of Narcotics - for area and production Prices: DES and respective Boards.
8	Condiments & Spices: Cardamom, Dry chilies, Black pepper, Dry ginger, Turmeric, Garlic, Fennal, Cumin, Ajwain, Methi, Tamarind, Nut meg, Cloves, Cinnamon, Coriander, Arecanut and other condiments and spices	Stated at (1) above.
9	Fruits and Vegetables: Banana, Mango, Grapes, Cashewnut, Papaya, Apple, Mosambi, Lemon, Orange, Lichi, Pineapple, Sapota, Guava, Potato, Sweet potato, Tapioca, Brinjal, Cabbage, Cauliflower, Okra, Tomato, Green peas, other vegetables, Onion, Cherry, Almonds, Walnut, Pear other temperate fruits, Subtropical fruits, Other citrus fruits, Jack fruit, Drumstick, floriculture, backyard farming	Area and Production: (1) Land use statistics (LUS), DES/ M/o Ag. (2) National Horticulture Board (NHB),M/o Ag (3) NSS Reports Prices: State DES
10.	Other Misc. crops: Rubber, Fodder, Mulberry, Guar Seed, Grass, Misc. Food & Misc. Non-food crops	Production: LUS Prices: State DES
11.	By products: Straw, Stalks and sticks of cereals and pulses cane trash, bagasse, poppy seed and poppy husk	Production: 1) CCS Reports 2) State/UT DES's Prices : State/UT DES

VALUE OF OUTPUT OF LIVESTOCK AND LIVESTOCK PRODUCTS-DATA SOURCES

Sl. No.	Categories	Item	Sources of Data
1.	Milk	Milk	Integrated Sample Survey (ISS), Dept. of Animal Husbandry, Dairying and Fisheries, M/o Agriculture) for production data. Prices: State DES
2.	Meat Group (i) Meat (ii) Meat Products (iii) By-products	Beef, Mutton, Pork, Poultry Meat and glands Fats, heads and legs Hides, skin, guts, blood, bones, horns, hoofs, tail stump, useless meat and Oesophagus	Production : State DESs Yield rates of CSO studies Prices: State DES (ii) and (iii) Production: CSO studies Prices : State DES
3.	Eggs	Eggs	Production : ISS Prices: State DESs.
4.	Wool & Hair (i) Wool (ii) Hair and Bristles	Sheep Wool Goat hair, Camel hair and Pig bristles	Prod. : ISS; Prices : State DESs Prod. : CSO Studies Prices: State DESs
5.	Dung	Dung Fuel and Dung Manure	Prod. : ISS Prices : State DESs
6.	Silk worm, Cocoons and Honey	Silk worm (Mulberry, Tussar, Ericot and Munga), Honey	Silk worm: Central Silk Board for prodn. and prices; Honey: KVIC for production and prices
7.	Increment in Stock	Increment in livestock of all categories of all animals	Population : 15 th to 17 th all India Livestock Censuses (1992, 1997, 2003) Prices : State DESs

VALUE OF INPUTS: AGRICULTURE AND LIVESTOCK SECTORS*(Data sources & Methodology)*

S.No.	Inputs	Data Sources	Methodology
1.	Seed	Area: DESAg Consumption: CCS Price: State DESs	Production: Area * Consumption (per ha.) Value: Prod * price
2.	Organic manure	Production: ISS, DAHDF Prices: State DESs Utilisation of Dung for manure purpose – rate provided by DAHDF	Production: Evacuation rate * population (bovine animals);
3.	Chemical Fertiliser	Prodn. & Price: Fertiliser Association of India (FAI)	Value= Prod * Price
4.	Pesticides & Insecticides	Production: Crop Care Foundation of India (CCFA) & M/Agriculture Prices : WPI	Method: Prod. * Price
5.	Irrigation Charges	Budget documents of State Governments	
6.	Electricity	Production: Central Electricity Authority(CEA) Price: WPI	Prod (Electricity consumed by Agriculture) * Price
7.	Market charges	Adhoc surveys (Market Intelligence Unit of DESAg), 2004-05 for market charges of agriculture	Agri: 2.358% of GVO Livestock : Buff (Rs. 2.97), Cattle (Rs.2.87), Goat and Sheep (Re. 0.8), Pig (Re. 0.5)
8.	Diesel Oil	Prices: Indian Oil Corporation Prod: No. of tractors and Diesel Engines from the ILC and consumption rates from CCS	<ul style="list-style-type: none"> • Total consumption of High Speed Diesel(HSD) by tractors * Price of HSD • ii) Total consumption of Low Speed Diesel(LSD) by Diesel Engines * Price of LSD
9.	Current repairs, Maintenance of fixed assets & Operation Cost	AIDIS(2002-03) (Decennial)+surveys	0.25% of value of output of Milk, hides & skin, Eggs & Poultry Meat, Wool & Hair, Honey & Silk worm cocoons. +Repair & Maintenance of fixed assets of Agriculture
10.	Feed of livestock	Roughages: as estimated in crop production Concentrates: NSS Studies for consumption rates, Prices: WPI	Production.: Consumption rate * population (Bovine & Ovine)
11.	FISIM	As estimated in the banking sector of national accounts statistics	

AVERAGE YIELD RATES OF PRODUCT AND BY PRODUCTS OF MEAT (K.G.)

S.No.	Product/ By-Products	Average Yield Rates 1999-00 Series				
		Cattle	Buffalo	Goat	Sheep	Pig
1	Edible offals & glands	4.444	5.09	0.706	0.708	1.741
2	Heads	5.889	7.31	0.792	0.811	3.485
3	Legs	4.889	6.09	0.455	0.539	1.042
4	Fats	4.806	8.97	0.286	0.219	2.670
5	Oesophagus	0.206	0.31	0.075	0.037	0.185
6	Blood	8.500	8.84	0.674	0.564	2.267
7	Tail stumps	0.875	0.72	-	-	-
8	Bones	11.833	14.31	-	-	-
9	Guts	3.389	4.22	0.706	0.903	2.484
10	Horns	0.542	1.28	0.076	0.06	-
11	Hoofs	0.347	0.34	0.059	0.047	0.140
12	Useless meat	2.972	6.56	0.323	0.236	0.816

CONTRIBUTION OF EACH GROUP IN THE VALUE OF OUTPUT OF AGRICULTURAL SECTOR
(1999-2000)

Sl. No.	Group	Share (%)	Items
1.	Cereals	26.2	Cereals: Paddy, Wheat, Jowar, Bajra, Barley, Maize, Ragi & Small Millets and other cereals
2.	Pulses	3.5	Pulses: Gram, Moong, Tur, Moth, Horse Gram, Masoor, Urad, peas etc. and other pulses
3.	Oilseeds	5.6	Oil Seeds: Linseed, Groundnut, Rapeseed and Mustard, Sesamum, Castor seed, Coconut, Safflower, Niger seed, Soyabean, Taramira Sunflower and other oilseeds
4.	Sugar	4.8	Sugar: Sugarcane, palmyra, Gur other sugar
5.	Fibres	2.6	Fibres: Kapas, Jute, Sunhemp, Mesta, other fibres
6.	Indigo	0.0	Indigo dyes and tanning material: Indigo, other dyes and tanning material
7.	Drugs and Narcotics	2.1	Drugs & Narcotics: Tobacco, Tea, Coffee, Opium, Betel leaves, Isabgol, Saffron, Coca, other drugs & narcotics.
8.	Condiments and spices	3.0	Condiments & Spices: Cardamom, Dry chilies, Black pepper, Dry ginger, Turmeric, Garlic, Fennel, Cumin, Ajwain, Methi, Tamarind, Nut meg, Cloves, Cinnamon, Coriander, Arecanut and other condiments and spices
9.	Fruits & Vegetables	17.2	Fruits and Vegetables: Banana, Mango, Grapes, Cashewnut, Papaya, Apple, Mosambi, Lemon, Orange, Lichi, Pineapple, Sapota, Guava, Potato, Sweet potato, Tapioca, Brinjal, Cabbage, Cauliflower, Okra, Tomato, Green peas, other vegetables, Onion, Cherry, Almonds, Walnut, Pear other temperate fruits, Subtropical fruits, Other citrus fruits, Jack fruit, Drumstick, floriculture, backyard farming
10.	Other Miscellaneous crops	4.5	Other Misc. crops: Rubber, Fodder, Mulberry, Guar Seed, Grass, Misc. Food & Misc. Non-food crops
11.	By Products	5.1	By products: Straw, Stalks and sticks of cereals and pulses cane trash, bagasse, poppy seed and poppy husk
12.	Total crops	74.7	
13.	Milk	17.2	Milk
14.	Meat group	4.3	Beef, Mutton, Pork, Poultry Meat and glands, Fats, heads and legs, Hides, skin, guts, blood, bones, horns, hoofs, tail stump, useless meat and Oesophgus
15.	Eggs	0.9	Eggs
16.	Wool group	0.1	Sheep Wool Goat hair, Camel hair and Pig bristles
17.	Dung	2.1	Dung Fuel and Dung Manure
18.	Silk group	0.3	Silk worm (Mulberry, Tussar, Ericot and Munga), Honey
19.	Increment in livestock	0.6	Increment in livestock of all categories of all animals
20.	Total livestock	25.3	
21.	Total agriculture	100.0	

VALUE OF OUTPUT FROM AGRICULTURE (PROPER) 1999-2000

S. No.	Item	Rs. Crore		Item	Rs. Crore
1	Cereals	134096	6	Sugars	24669
1.1	Paddy	70416	6.1	Sugarcane	16757
1.2	Wheat	46224	6.2	others	7912
1.3	Jowar	5621	7	Drugs & narcotics	10752
1.4	Bajra	3292	7.1	Tea	3041
1.5	Barley	823	7.2	Coffee	1868
1.6	Maize	5928	7.3	Tobacco	2258
1.7	Ragi	1144	7.4	Others	3585
1.8	Small millets & Other cereals	648			
2	Pulses	18153	8	Condiments & Spices	15447
2.1	Gram	6314	8.1	Cardamom	435
2.1	Arhar	4210	8.2	Chillies	4025
2.3	Urad	2053	8.3	Black Pepper	1100
2.4	Moong	1765	8.4	Dry Ginger	961
2.5	Masoor	1650	8.5	Turmeric	1911
2.6	Horse gram	288	8.6	Arecanut	3846
2.7	Others	1872	8.7	Garlic	1100
3	Oilseeds	28625	8.8	Coriander	475
3.1	Linseed	342	8.9	Others	1594
3.2	Sesamum	925	9	Fruits & Vegetables	88037
3.3	Groundnut	6660	9.1	Banana	6465
3.4	Rapeseed & Mustard	6926	9.2	Cashewnut	2013
3.5	Castor	1225	9.3	Potato	6204
3.6	Coconut	5148	9.4	Sweet Potato	624
3.7	Niger seed	218	9.5	Tapioca	1696
3.8	Safflower	284	9.6	Onion	1804
3.9	Sunflower	857	9.7	Floriculture	4164
3.10	Soya bean	5951	9.8	Kitchen garden	1882
3.11	Others	90	9.7	Other	63185
4	Dyes & Tanning material	18	10	Other Crops	23397
5	Fibres	13373	10.1	Rubber	1722
5.1	Kapas	11752	10.2	Guar Seed	829
5.2	Jute	1454	10.3	Miscellaneous crops	20846
5.3	Sun hemp	32	11	By-products	26264
5.4	Mesta	113	11.1	Straw & Stalks	24094
5.5	Others	22	11.2	Others	2170
				Total value of output	382833

Appendix 9.8

VALUE OF OUTPUT FROM LIVESTOCK

(1999-2000)

(Rs. Crore)

S. No.	Item	Output
1	Milk Group	88092
2	Meat Group	21905
2.1	Meat	18521
2.1.1	Beef	2060
2.1.2	Mutton	6696
2.1.3	Pork	997
2.1.4	Poultry meat	8768
2.2	Meat products	720
2.3	By-products	2665
2.3.1	Hides	991
2.3.2	Skin	1070
2.3.3	Other by-products	604
3	Eggs	4398
4	Wool & hair	281
4.1	Wool	209
4.2	Hair & bristles	73
5	Dung	10533
5.1	Dung fuel	4295
5.2	Dung manure	6238
6	Silk worm cocoons & honey	1384
7	Increment in stock	2937
8	Total value of Output	129531

Appendix 9.9

VALUE ADDED FROM AGRICULTURE AND ALLIED ACTIVITIES

(1999-2000)

S. No.	Item	Rs. Crore
1	Value of output	512363
1.1	Agriculture	382833
1.2	Livestock	129531
2	Less input	113628
2.1	Seed	9022
2.2	Organic manure	5821
2.3	Chemical fertilizers	21205
2.4	Current repairs, maintenance of fixed assets & Other operational costs	1894
2.5	Feed of livestock	53840
2.6	Irrigation charges	547
2.7	Market charges	9037
2.8	Electricity	2932
2.9	Pesticides & insecticides	986
2.10	Diesel oil	5609
2.11	FISIM	2735
3	Gross value added	409660
3.1	Agriculture & allied activities	398735
3.2	Operation of irrigation system	10925