Discussion Paper - 2

Estimates of District Domestic Product

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Prologue

The central and state authorities and research institutions often require data on economic activities and levels of living of people at the district level for planning and policy purposes. Income of a district is considered one of the most important indicators / barometers to measure the economic growth / development of a district vis-à-vis others. Preparation of District Income estimates has recently gained added importance, since it is one of the three indicators to construct a composite Human Development Index (HDI) for inclusion in the Human Development Reports (HDR) being prepared by several states in India.

The present paper has been written in a scenario where the national level data system is rigorous and well designed, with matching state data but very little information at the district level. The 73rd and 74th constitutional amendments have brought in a third tier of government – the Panchayats – into India. How does this major change impact on data systems? The need thus is for district level indicators not only to make the state HDR more relevant, but also to improve local understanding of the development process.

This background paper was presented at the National Workshop on State HDRs and the Estimation of District Income & Poverty under the State HDR Project that is executed by the Planning Commission, GOI, with UNDP support held in Bangalore in July 2001. It is the second in the HDRC's Discussion Paper Series.

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GLOSSARY

AIDIS	All India Debt and Investment Survey
ASI	Annual Survey of Industry
CCS	Cost of Cultivation Studies
CIF	Chief Inspector of Factories
CSO	Central Statistical Organisation
DDP	District Domestic Product
DES	Directorate of Economics and Statistics
DPD	Data Processing Division
DTE	Directory Trade Establishment
FISIM	Financial Intermediary Services Indirectly Measured
FOD	Field Operation Division
GVA	Gross Value Added
HDI	Human Development Index
ISS	Integrated Sample Survey
NIC	National Industrial Classification
NAD	National Accounts Division
NSSO	National Sample Survey Organisation
ONGC	Oil and Natural Gas Corporation
PPP	Purchasing Power Parity
SDP	State Domestic Product

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Introduction

For planning and policy purposes, the central and state authorities and research institutions often require data on economic activities and levels of living of people at the district level. Income of a district is thought to be one of the most important indicators / barometers to measure the economic growth / development of a district vis-à-vis others. Preparation of District Income Estimates has recently gained added importance, since it is one of the three indicators to construct a composite Human Development Index (HDI) for inclusion in the Human Development Report being prepared by many State Governments in India. The other two indicators for calculating HDI are life expectancy and educational attainment.

Some of the State Governments have started preparing estimates of district income to measure income disparity and to plan for the development of backward districts during the 1970s and early 1980s. For example, the state of Uttar Pradesh compiled district income estimates for all sectors for 1968-69 but later restricted the preparation of these estimates to commodity producing sectors only.

The estimation of income at district level is beset with the problems of availability of data as well as collection and analysis of information. The Seventh Conference of Central and State Statistical Organisations which was held at Hyderabad in December 1985, discussed issues relating to the estimation of income at district as well as at rural and urban levels. Keeping in view the demand from the Planning Commission and the state governments for income estimates at the district and rural / urban levels, the Conference recommended constitution of a Technical Group to examine the requirements of data and recommend appropriate methodology for compilation of these estimates. In pursuance of this recommendation, the Department of Statistics constituted a Technical Group for Estimation of Income at District and Rural / Urban Levels in January 1987. The Group in its Report, which was submitted in September 1988 made the following observations (CSO, 1988):

- To begin with, attempts should be made to compile district income estimates following the standard methodology, which is based on the income originating approach. This method is similar to the one used for compilation of state income estimates. Due to the free flow of goods and services across district borders and the non-availability of net factor income earned by the residents of

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other districts/states/countries, the income accruing approach is not feasible.

- Even to compile estimates following the income approach, considerable additional data, as detailed in the Report, needs to be collected.

- For district income estimates, a large amount of information would need to be collected and compiled at the district as well as at state level. The Group felt that the state governments should assess the precise requirements for additional resources for implementing the recommendations of the Group and make necessary provisions in their core schemes.

- Since estimates at the district level would be utilised for the purpose of determining the backwardness/development of a district, and as a consequence for allocating resources, it would be necessary to make essential adjustments in these estimates with regard to significant flow of income across the territories of districts which are rich in minerals and/or forest resources or where flow of daily commuters, migration of labour and cattle are involved.

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The Group also detailed the data requirements for compilation of district income estimates and annexed the essential items for which data need to be maintained at the district level.

Methodology for District Income Estimates

With a view to giving impetus to the compilation of district income estimates by the state governments and to standardise the methodology of the National Accounts Division (NAD), the Central Statistical Organisation (CSO) convened a meeting with the State Directorates of Economic and Statistics (DES) in 1995. The Meeting entrusted the development of the methodology of compilation of District Domestic Product (DDP) jointly to the DES of the states of Karnataka and Uttar Pradesh which was completed in August 1996. The state governments have been following this methodology for preparation of district income estimates.

A number of state governments have already initiated the process of preparation of DDP. While Andhra Pradesh, Bihar, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu and Uttar Pradesh are compiling estimates for all the sectors of the economy, Arunachal Pradesh and Assam have restricted this to the commodity producing sectors. Specific comments on the methodology adopted for compiling the estimates of DDP by Karnataka, Maharashtra, and Tamil Nadu are given in the Annexure.

The methodology for compiling the DDP, given in the following paragraphs, takes into consideration the broad guidelines given in the Report of the Technical Group on District Income and also its recommendations and the methodology which was developed jointly by the DES of Karnataka and Uttar Pradesh in August 1996. The proposed methodology takes into account the available data at the district level for the commodity producing sectors and the results of the surveys, both relating to socio-economic aspects and unorganised sectors of the economy, conducted by the National Sample Survey Organisation (NSSO) and states DES. For many sectors of the economy, the proposed methodology avoids allocation of state estimates to districts in proportion to the districtwise workforce, as this does not take into account the income disparity at the district level.

Broadly, the methodology of computation of sectoral estimates is the same as adopted for estimates of State Domestic Product (SDP). The database for estimation of DDP is still not satisfactory for any of the states. Data for compilation of DDP for commodity producing sectors viz., primary sector and manufacturing (registered) sector, are mostly avail-

Broadly, the methodology of computation of sectoral estimates is the same as adopted for estimates of State Domestic Product (SDP).

able on a regular basis but are very scanty in respect of the remaining sectors. As such, wherever districtwise basic data are available, they may be utilised to compute the DDP estimates, following the methodology adopted at the state level. In the case of non-commodity producing sectors, where districtwise basic data are not available, the state level estimates may be allocated to the districts on the basis of suitable districtwise indicators. Further, in some of the commodity producing sectors, though districtwise production data are available, the corresponding prices are not available. In such cases, districtwise production may be evaluated using prices prevailing in the adjoining district / region.

For the commodity producing sectors, the estimates of DDP may be prepared using the production approach i.e., gross value added is equal to value of output *minus* value of inputs, whereas for service sectors income approach i.e., gross domestic income is equal to compensation of employees *plus* gross operating surplus, may be used.

For compiling DDP, the economy may be divided into following 14 broad sectors (8 commodity producing and 6 non-commodity producing sectors) as done in the case of SDP.

Commodity Producing Sectors

- Agriculture
- Forestry and Logging
- Fishing
- Mining and Quarrying
- Manufacturing – Registered
- Manufacturing – Unregistered
- Construction
- Electricity, Gas and Water Supply

Non-Commodity Producing Sectors

- Trade, Hotels and Restaurants
- Transport, Storage and Communication
- Banking and Insurance
- Real Estate, Ownership of Dwellings and Business services
- Public Administration and Defence
- Other services

A detailed sector-wise methodology follows.

Commodity Producing Sectors

Agriculture including Animal Husbandry

As in the case of SDP, the estimates of value of output of agriculture and animal husbandry may be prepared separately. Since farmers feed the animals together and do not keep separate account of inputs for agricultural crops and animal products, the estimates of inputs cannot be prepared separately. As such, the value added estimates may be prepared for the overall activity of agriculture.

Value of Output of Crop Husbandry

As in the case of SDP, the estimates at district level can also be worked out using the 'production approach'. But district level data on production and prices are generally not available uniformly for all the crops. Data is compiled by State directorates for "Major Crops" as listed by CSO. However the category "Minor Crops" varies according to specific states. Hence, for estimation purposes, crops may be classified in the following categories:

- ***Crops for which districtwise data on production and prices (primary market or farm harvest prices) are available.*** In such cases, districtwise value of output for each crop may be worked out by using districtwise production and prices.

- ***Crops for which districtwise data on production is available but corresponding districtwise prices are not available.*** For this category of crops, districtwise value of output may be computed by using production data of the district and available price data from a neighbouring district. In case neighbouring district prices are also not available, regional prices may be used. If these are also not available, the only alternative is to use state prices. Efforts should be made to collect prices in respect of all such crops for which area and yield estimates are available.

- ***Crops for which districtwise data, both on production and prices, are not available but crop area figures are available.*** In such cases, districtwise value of output of these crops may be worked out by allocating the state level value of output on the basis of districtwise crop area.

- ***Miscellaneous and unspecified crops for which production and price data are not available even at the state level but districtwise crop area is available.*** In these cases, the value of output may be worked out by mul-

Value added estimates may be prepared for the overall activity of agriculture

tiplying the districtwise crop area with state level value per hectare of respective crops.

For by-products or miscellaneous type of products, wherever possible, Cost of Cultivation Studies (CCS) data on yield rates, inputs, etc .may be used. In the absence of data of CCS for the district, attempts may be made to undertake type studies to fill this gap. Till such time as the results of studies or data from other sources at the district level become available, state level ratios, whether in relation to output or in relation to crop area, as used in current series of estimates of SDP, may be adopted uniformly for all the districts.

For the quantity of food grains procured on Government account, the prices are different from the prevailing market prices. As such, the quantity procured by the Government may be evaluated at procurement prices and the rest of the produce at the primary market / farm harvest prices.

Value of Output of Animal Husbandry

A procedure similar to the one adopted for compiling SDP may be followed to estimate the value of output from animal husbandry for the district. Districtwise estimates of a number of different categories of animals and poultry may be worked out using the results of the latest two / three livestock censuses, assuming linear / compound growth rates. These may be used along with relevant yield rates to obtain the estimates of production of various livestock products and by-products and poultry meat.

In general, the results of Integrated Sample Survey (ISS) conducted by State Animal Husbandry Department provide state / district level data on production of milk, meat, wool and eggs. The survey also provides estimates of the number of slaughtered animals category wise. Wherever, ISS results are available only for the state, the estimates for districts may be obtained by allocating the state estimate to the districts on the basis of relevant livestock population. To estimate districtwise production of all other items (i.e. other than milk, meat, eggs and wool), state level yield rates and ratios may be utilised along with district estimates of the number of relevant animals / poultry.

Districtwise value of output may then be worked out by multiplying the production obtained as above, by the corresponding district prices, wherever available. In the absence of region or district level prices, state prices may be utilised for evaluating district production. Total value of output thus worked out may then be adjusted to the state level estimates.

With regard to the items for which price data are not available, wholesale / retail prices of allied items should be utilised. The price data can be used in various cases as indicated in the table.

In the case of other animal products, for which neither the yield rates nor the prices are available at the district level, the state level value may be allocated to

Item	Price to be used
• Milk	Rural price/cooperative's collection price
• Meat (buffalo)	Slaughter house price
• Goat, sheep and pig meat	Slaughter house price
• Hides (cow and buffalo)	Slaughter house price
• Skins (goat and sheep)	Urban wholesale price of goat skin
• Bones (of various animals)	Urban wholesale price of bone
• Dung	Rural prices of dung cake
• Eggs (hen and duck)	National Egg Coordination Committee prices

the districts in proportion to the number of animals of each category separately.

Districtwise increment in stock for each category of animal/poultry may be worked out as at the state level and these may be evaluated by corresponding district prices.

The value of silkworm cocoons compiled for the SDP may be allocated to districts in proportion to the area under mulberry in each district, after adjusting for the cost of rearing silkworm cocoons.

Keeping in view the data gaps, it is suggested that the coverage of ISS may be enlarged by the respective state governments so as to generate the estimates of production of each of the animal products at the district level. Further, prices of agricultural and animal products at the district level need to be collected and compiled from representative centres so that for each of the products price data are available and utilised for district income estimates.

Value of Inputs for Crops and Animal Husbandry

To arrive at the districtwise gross value added (GVA) from agriculture, including the Animal Husbandry sector, the value of various input items are to be first deducted from the gross value of output of these sectors to which the gross product from operation of government irrigation system is added. The deductible inputs are the same as used in compilation of SDP viz.

- Seed
- Organic manure (cattle and buffalo dung)
- Chemical fertilisers
- Feed of livestock
- Pesticides & insecticides
- Diesel oil consumption
- Electricity
- Irrigation charges
- Market charge
- Repairs and maintenance of fixed assets and other operational costs and
- Financial intermediary services indirectly measured (FISIM).

To work out the value of these input items at the district level, the state level estimates arrived at independently under the current series of state income estimates may be distributed to the districts on the basis of the procedure indicated below:

To arrive at the districtwise gross value added (GVA) from agriculture, including the Animal Husbandry sector, the value of various input items are to be first deducted from the gross value of output of these sectors to which the gross product from operation of government irrigation system is added

State level value of consumption by tractors and oil engines may be distributed to districts in proportion to the district weighted totals of number of tractors and oil engines/oil engine pumps used for irrigation as per latest livestock census

- ***Seed***: Seed rates and area sown for each of the important crops at the district level are generally available with the district agricultural departments. These data should be collected and the quantity of seed for each of the crops may be worked out as a product of seed rate and area under each crop. This may be multiplied by the respective prices at the district level to arrive at the value of seed input. For other crops for which seed rates are not available at the district level, the input of seed for each of the crops may be worked out by allocating the value at state level in proportion to the area under each crop at the district level.

- ***Organic manure:*** State level value of output may be allocated to the district in proportion to the districtwise estimates of value of output of dung manure, as worked out in the Animal Husbandry sector.

- ***Chemical fertilisers:*** State level value may be distributed to districts in proportion to total quantity of chemical fertilisers distributed, as obtained from the Agriculture Department.

- ***Feed of livestock:*** Districtwise value of roughage may be estimated by adopting the same methodology as followed for estimating the roughage in the case of SDP. For estimating the quantity of concentrates consumed, the returns of CCS may be collected from the agricultural universities that are engaged in such studies in the State and analysed. In the absence of such study results, the rates of concentrates as adopted for state level estimates for different types of animals and poultry may be used for working out district level estimates.

- ***Pesticides and insecticides:*** State level value may be allocated to the districts in proportion to area treated by chemical pesticides in different districts. Efforts may be made to obtain the results of CCS in a state at the district level and the value of pesticides and insecticides districtwise may be worked out.

- ***Diesel oil consumption:*** State level value of consumption by tractors and oil engines may be distributed to districts in proportion to the district weighted totals of number of tractors and oil engines/oil engine pumps used for irrigation as per latest livestock census, weight being the per unit consumption of diesel oil based on the data collected from the schedules of CCS. If district level consumption of diesel per unit is not available, then state level norms may be adopted.

- ***Electricity:*** State level value may be distributed on the basis of districtwise number of private and government electric tube-wells and energised pump-sets.

- ***Irrigation charges:*** Districtwise irrigation charges, as collected from the district administration may be

used for this purpose. In the absence of such data, the state level value may be distributed to the districts in proportion to the area irrigated by government canals.

- ***Market charges:*** Market charges may be ascertained from the primary markets within the district and used. In the absence of such data, state level norms may be used for district income estimates also.

- ***Repair and maintenance of fixed assets and operational costs:*** Districtwise data on fixed assets as available from latest All India Debt and Investment Survey (AIDIS)/ Livestock Census may be used to allocate the state total to the districts. Alternatively, the districtwise value of output may be multiplied with the state level ratios of repairs and maintenance etc. to the value of output.

- ***FISIM:*** State level value of FISIM may be distributed on the basis of total value of output of the district.

Operation of Government Irrigation System

Data on salaries and wages are likely to be available with the district agriculture departments. These should be collected and used for allocation of the state level value of contribution by government irrigation system to the districts in proportion to the districtwise salaries and wages/area irrigated by government canals.

Forestry and Logging

Major Forest Products

The forest circles/divisions/sub-divisions are generally not coterminous with district boundaries. The records of the forest/revenue departments at the division/sub-division/forest range/forest coupe levels will have to be looked into, so as to demarcate forest areas within a district. For example, in case of Madhya Pradesh, the boundaries are now coterminous with one or more forest divisions.

Districtwise value of output of timber may be worked out using districtwise production and prices for different varieties.

Districtwise value of output may be worked out using the districtwise production and prices of different products

In the case of firewood, consumption of firewood may be estimated at the district level using the pooled results of central and state samples of the latest available data (55th Round) of NSSO relating to household consumer expenditure. The value of firewood at the state level may be allocated to the districts in proportion to the districtwise consumption of firewood.

Minor Forest Products

Districtwise value of output may be worked out using the districtwise production and prices of different products wherever available from the Minor Forest Products Corporation etc. For other products, in the absence of districtwise data, the state level value of other minor forest produce may be allocated to districts in proportion to the forest area in the districts.

Repairs, Maintenance and other Operational Costs

State level ratio may be utilised for working out districtwise estimates of repairs, maintenance and other operational costs.

Fishing

In the case of marine fishing, the districtwise value of output may be worked out by multiplying the districtwise production by the corresponding district prices. A similar procedure may be followed in the case of inland fish also. The district wise data on production of marine and inland fish is likely to be available from the district fishery officer. In case the districtwise prices are not available, then districtwise value may be worked out using districtwise production and adjoining district/region prices. Data on operational costs, including repairs and maintenance are not available even for estimating SDP and the national level norms are used for SDP. Thus, there is no other alternative but to use the state level norm/ratios for DDP estimates also.

In case the districtwise prices are not available, then districtwise value may be worked out using districtwise production and adjoining district/ region prices

Mining and Quarrying

For major minerals including petroleum (crude) and natural gas (utilised), the districtwise value of output as available with Indian Bureau of Mines, Nagpur may be used. District wise value of production of coal can also be obtained from Coal India Ltd. and that of natural gas and crude oil from Oil and Natural Gas Corporation (ONGC). For minor minerals, the districtwise value of output may be collected from the State Mines and Geology Department. If the data are not available, the value of output of minor minerals may be worked out in proportion to the royalty value. For working out input costs, the state level proportions may be adopted.

Manufacturing

Registered

The Annual Survey of Industry (ASI) being conducted by the Field Operation Division (FOD) of the NSSO provides the requisite data for compiling estimates of GVA for manufacturing-registered sector (units registered under the Factories Act, 1948) both at the national and state levels. The sampling strategy adopted by ASI till 1996-98 aimed at providing data to generate district level estimates by the DES.

On the recommendation of a Steering Committee constituted by the Department of Statistics and Programme Implementation, Government of India in May 1999, a revised sampling strategy has been put into operation from ASI 1998-99 so as to enable the FOD of the NSSO to manage the field work of about 45000 units with the sanctioned field resources. Under the new sampling strategy, ASI would cater to the generation of estimates only at all-India and State levels. All factories engaging 200 or more workers are being covered on a complete enumeration basis (called census sector) and the remaining factories on a sample basis (called sample sector). However, in the case of the small states /union territories of Manipur, Meghalaya, Nagaland, Tripura and Andaman and Nicobar

Islands, all factories are being covered on a complete enumeration basis.

At present, the states of Assam, Orissa, Rajasthan, Uttar Pradesh, and West Bengal cover the residual units belonging to the sample sector of their states with their own resources. Districtwise estimates can be computed for these states by appropriately pooling the results of units covered by the state field staff and the ASI field work (census sector and sample sector) conducted by FOD of the NSSO. Other state governments who are interested in generating district level estimates may take steps to cover additional samples with their own resources. Till such time the states DES are able to mount resources to participate in the ASI programme, the GVA for the sample sector may be allocated to the districts using an appropriate indicator. The value added per worker derived from the results relating to the census sector of the ASI for the district multiplied by an estimate of the workforce engaged in the sample sector of ASI from the district may be taken as the indicator for allocating the GVA for the sample sector of the ASI for the state to the districts. The data collected under the Fourth Economic Census 1998-99 can be utilised to work out an estimate of the workforce engaged in the sample sector of factories covered in the ASI of the district.

It is understood that the Chief Inspector of Factories (CIF) in most of the states maintains an up-to-date computerised list of factories registered under the Factories Act, 1948. The field staff of FOD of NSSO is using it as a frame for ASI fieldwork. The list available with the CIF contains information relating to the number of workers in each registered factory. This list can be used for estimating the workforce engaged in the sample sector of factories covered in the ASI in any of the districts, as an alternative to using the data collected under the Fourth Economic Census.

Unregistered

For the manufacturing unregistered and the unorganised segments of the remaining sectors of the economy i.e. unorganised trade, unorganised hotels and restaurants, unorganised road transport, unrecognised educational institutions, unorganised medical and health services, etc. the estimates of GVA are worked out as a product of workforce and GVA per worker. While the GVA per worker is derived from the follow-up surveys of economic censuses carried out by the NSSO, the workforce is estimated from the quinquennial surveys of employment and unemployment of the NSSO.

State governments who are interested in generating district level estimates may take steps to cover additional samples with their own resources

The Fifty-sixth round (2000-01) of the NSS covered the unorganised manufacturing sector, (i.e. not registered under the Factories Act, 1948). Central and state samples may be pooled to generate the districtwise GVA per worker at 2-digit level of National Industrial Classification (NIC) as done for the SDP. GVA per worker may be multiplied by the corresponding estimates of workforce (discussed in the following paragraphs) to arrive at the GVA at 2-digit level of NIC. The total GVA for the sector at the district level may be arrived at by aggregation.

The estimates of the workforce for 1993-94 at the state level, based on the 50th round (1993-94) Survey of Employment and Unemployment of NSS, along with the methodological note, at 3-digit level of NIC were supplied by the National Accounts Division (NAD) of the CSO to the states for use in the state income estimates in March 1999. In what follows, the estimates of workforce will refer to the workforce based on the surveys of NSSO mentioned above.

For any activity (2-3 digit level of NIC), the estimate of workforce as provided by the NAD of the CSO, may be estimated by allocating the state total to various districts in proportion to districtwise workforce, in that activity, as available from the latest population census.

For any activity (2-3 digit level of NIC), the estimate of workforce as provided by the NAD of the CSO, may be estimated by allocating the state total to various districts in proportion to districtwise workforce, in that activity

From the total workforce for manufacturing at the district level the corresponding workforce of manufacturing - registered based on ASI may be subtracted to arrive at the workforce for the manufacturing - unregistered sector at 2-digit level of NIC.

Construction

Data on wage rates of construction workers can be easily collected at the district level. The estimates of state income from this sector may be allocated to the districts on the basis of indicator of workforce engaged in construction activity multiplied by the wage rate of construction workers at the district level. In respect of local bodies, direct districtwise data may be collected and utilised.

Electricity, Gas and Water Supply

Electricity

Districtwise data on salaries and wages paid to employees are available with the State Electricity Boards (SEBs). Special efforts may be made to collect/extract data from the administrative records available with SEBs. The state level value added from this sub-sector may be distributed to the districts in proportion to districtwise salaries and wages. The use of workforce alone as an indicator will not take into account the disparity in wages and salaries at the district level. Although the pay scales are the same for all districts, the distribution of workers by different pay scales may vary significantly for developed and under developed districts. Thus, to capture this disparity, the indicator based on salaries and wages will be more meaningful.

Gas

State level value added from biogas may be distributed in proportion to the number of biogas plants in each district. For the remaining gas sector, the state level estimates may be allocated to the districts on the basis of workforce engaged in this activity.

Water supply

State level value added may be allocated to districts in proportion to the districtwise salaries and wages collected from local bodies in the district.

Non–Commodity Producing Sectors

For the unorganised segments of the non-commodity producing sectors, districtwise GVA for a particular activity, may be estimated as a product of workforce and the GVA per worker. For the non-commodity producing sectors, districtwise total workforce at two or three digit of NIC may be based on the NSS surveys of employment and unemployment as discussed under manufacturing–unregistered sector. For public sector undertakings or for the organised segments, the workforce will be based on the administrative records of the undertakings/enterprises. The workforce for the unorganised segments or for the private sector may be derived by subtracting from the total workforce of an activity, the corresponding workforce in the organised segment or in the public sector as the case may be. The value added per worker may be derived from the pooled results of central and state samples of quinquennial surveys of NSSO for the unorganised activities.

Trade, Hotels and Restaurants

Trade

Public Sector

SDP relating to public sector may be allocated to districts on the basis of data on salaries and wages available from the administrative records of the relevant public sector undertakings engaged in trading activity.

Private Sector

The 53rd round (1997) NSS survey covered unregistered trading activities by non-directory establishments (enterprises engaging not more than five workers including at least one hired worker) and own account enterprises and the states participated in this programme as in any other round of NSS. The directory trading establishments (enterprises engaging six or more workers including at least one hired worker) were surveyed by special staff of FOD of NSSO of the same rank as those engaged for conducting the field work of ASI during the same year. The survey is called Directory Trade Establishment (DTE) Survey. The states did not participate in the DTE survey. The estimates at the district level for the benchmark year 1997 may be worked out by pooling the results of central and state samples relating to non-directory enterprises and own account enterprises. For other years, SDP relating to the private segment of the economy relating to this sector may be allocated to each district in proportion to the gross value of output of commodity producing sectors in the district.

SDP relating to public sector may be allocated to districts on the basis of data on salaries and wages available from the administrative records of the relevant public sector undertakings engaged in trading activity

Hotels and Restaurants

The Fifty-seventh round (2001-2002) of the NSS is the first attempt to cover comprehensively all the unorganised services except trade and finance. In particular it covered the unorganised segments of hotels and restaurants; transport, storage and communications; real estate, renting and business activities; education; health and social work; and other community, social and personal service activities. For the purpose of the survey, the unorganised segment of any sector of the economy is defined to comprise those enterprises whose activities or collection of data are not regulated under any legal provision and / or which do not generally maintain any regular accounts.

The Fifty-seventh round (2001-2002) of the NSS is the first attempt to cover comprehensively all the unorganised services except trade and finance

Public Sector

SDP relating to public sector may be allocated to districts on the basis of data on salaries and wages available from the administrative records of the relevant public sector undertakings engaged in hotel and restaurant activities.

Private Sector

The SDP relating to these activities in the private sector may be allocated to districts on the basis of district wise private workforce and the value added per worker as obtained from the pooled results of central and state samples of 57th round of NSS for the unorganised sector. Districtwise private workforce may be estimated by subtracting from the total workforce for this activity, the corresponding workforce in the public sector undertakings.

Transport, Storage and Communication

Railways

State level estimates, as provided by CSO, may be allocated to districts in proportion to the track length located within the district.

Mechanised Road Transport

Public Sector

SDP relating to the public sector may be allocated to districts on the basis of data on salaries and wages available from the administrative records of the relevant public sector undertakings engaged in this activity.

Private Sector

The SDP relating to these activities in the private sector may be allocated to districts on the basis of district wise private workforce and the value added per worker as obtained from the pooled results of central and state samples of 57th round of NSS for the unorganised sector. Districtwise private workforce may be estimated by subtracting from the total workforce for this activity, the corresponding workforce in the public sector undertakings.

Non-Mechanised Road Transport and Other Unorganised Transport

The value added from this activity may be derived at the district level as a product of district wise workforce engaged in this activity and the value added per worker for this activity obtained from the pooled results of central and state

samples of 57th round of the NSS for the unorganised sector. Till such time the bench mark estimates of value added from 57th round are derived by pooling the central and state samples, the SDP relating to the private segment of this sector may be allocated to districts in proportion to districtwise gross value of output of commodity producing sectors.

Water Transport

Districtwise estimates may be derived using the same procedure as for the non-mechanised road transport.

Air Transport

The SDP from this sub-sector may be allocated to the districts in proportion to data on salaries and wages collected from the local offices of the airlines.

Storage

Warehousing (State and Central)

State level estimates may be allocated to the districts using the same procedure as for the mechanised road transport.

Cold Storage

Cold Storage is covered under ASI. The same procedure as used for manufacturing (registered) may be adopted.

Storage not elsewhere classified

Districtwise estimates may be prepared using the same procedure as for the non-mechanised road transport sector.

Communication

Public Sector

Data on salaries and wages may be collected from the public sector units located within the district to allocate the SDP from this activity. Alternatively SDP may be allocated using indicators of districtwise revenue generated by post and telegraph offices, telephones, etc., data for which may have to be collected from administrative records of the concerned offices.

Private Sector

Districtwise estimates may be prepared using the same procedure as for mechanised road transport sector.

Data on salaries and wages may be collected from the public sector units located within the district to allocate the SDP from this activity

Banking and Insurance

Data on salaries and wages can be collected from the regional/district offices of banks and insurance companies. The SDP of this sector may be allocated to districts on the basis of districtwise salaries and wages.

Real Estate, Ownership of Dwellings and Business Services

Real Estate and Business services

Districtwise estimates may be prepared using the same procedure as for non-mechanised road transport sector.

Ownership of Dwellings

State level estimates may be allocated to districts in proportion to number of

dwellings (Rural/Urban) in each district based on census data multiplied by districtwise rent per dwelling worked from the 55th round of NSS by pooling the results of central and state samples. Till such time districtwise rent per dwelling is estimated from 55th round survey, rent per municipal house may be ascertained from the municipalities within the district.

Public Administration

In the case of central government administration, data on central government employees are being collected by the Directorate General of Employment and Training (DGET). Efforts may be made to collect similar data at the district level to allocate the state totals. Alternately, till such time these data are collected, state total may be allocated in proportion to districtwise workforce. In the case of state government employees, data on salaries and wages at the district level may be collected from concerned departments to allocate the state total. For local bodies, district wise data may be collected from local bodies and used

In the case of central government administration, data on central government employees are being collected by the Directorate General of Employment and Training (DGET). Efforts may be made to collect similar data at the district level to allocate the state totals

Other Services

Education, Research and Scientific Services

Recognised Institutions

Data on salaries and wages of teaching and non-teaching staff are being compiled by the state education departments for recognised institutions, universities etc. in connection with their publication "Education in States" by aggregating the data at the district level. These data should be collected and may be used to allocate state totals to districts.

Unrecognised Institutions

For this activity the district wise estimates may be prepared using the procedure used for private mechanised road transport. Instead of public sector, the workforce for the recognised institutions may be subtracted from the total workforce for education to derive the workforce for the unrecognised institutions. Till such time the bench mark estimates of value added from 57th round survey are derived by pooling the central and state samples, the SDP relating to this sector may be allocated to districts in proportion to districtwise workforce multiplied by average tuition fees. Average tuition fees may be ascertained from a few unrecognised institutions and private tutors.

Medical and Health Services

Public Sector

Data on salaries and wages may be collected from the concerned units within the district and used to allocate State level estimates to districts.

Private Sector

Districtwise estimates may be prepared using the same procedure as for the mechanised road transport.

Legal Services

Districtwise estimates may be prepared using the same procedure as for the non-mechanised road transport.

Sanitary Services

District wise data (Rural / Urban) on salaries and wages may be collected from the local bodies and used to allocate the state level estimates.

Rest of Other Services

Districtwise estimates may be prepared using the same procedure as for the non-mechanised road transport.

Estimates at Constant Prices

The methodology for working out estimates at constant prices will be more or less the same as that for current prices in the sectors of Agriculture and Animal Husbandry, Forestry and Logging, Fishing, Mining and Quarrying, Manufacturing (unregistered), Construction, Real Estate, Ownership of Dwellings and Business services and Trade, Hotels and Restaurants.

In the sectors where estimates are worked out by 'Production Approach', the current year production may be evaluated on the basis of base year prices to obtain the value of output. For the remaining sectors, the District Income estimates at constant prices may be worked out using the state level deflator of current to constant prices. In the Mining and Quarrying sector, the districtwise price differentials may be introduced by multiplying the district wise gross value added at current prices by the ratio between the wages of non-agricultural and rural labour for the base year and for the current year.

In the sectors where estimates are worked out by 'Production Approach', the current year production may be evaluated on the basis of base year prices to obtain the value of output. For the remaining sectors, the District Income estimates at constant prices may be worked out using the state level deflator of current to constant prices

Issues for Discussion

Income Originating vs. Income Accruing Approach

For capturing the disparity in income and development, income accruing to the residents needs to be captured.

For capturing the disparity in income and development, income accruing to the residents needs to be captured. Due to free flow of goods and services across the borders of the districts and the non-availability of net factor income earned by the residents from other districts/states/countries, the income accruing approach is not feasible. Thus, the income originating approach is used for compilation of estimates of state income/district income.

The district level estimates would be utilised for the purpose of determining the backwardness/development of a district, and as consequence for allocation of resources by the planners and policy makers as well as for construction of a composite index HDI in connection with the Human Development Report. It would be necessary to make adjustments in these estimates in regard to significant flows of income from and to, across the territories of typical districts which are rich in minerals and/or forest resources or where significant flow of daily commuters (particularly the districts having state capitals or concentration of industrial units), migration of labour, cattle and net factor income from abroad are involved.

Frequency of Estimates

Since the main purpose of the estimates is for planning purposes and also in view of the present availability of data for the unorganised sectors at an interval of five years, it would be sufficient to compile these estimates at an interval of 5 years.

Purchasing Power Parity and HDI

Per capita DDP in real terms expressed in purchasing power parity dollars (PPP$) is used for construction of HDI. PPP$ are not available for the states/districts. Hence use of all India PPP$ is resorted to. The purchasing power of the rupee varies from state to state, district to district and within districts in rural and urban areas. Work on the estimation of purchasing power of rupee was initiated for the state of Maharashtra and two other states under the plan schemes during the 1980s but not much progress was made. If the HDI at the district level has to have some meaning, then studies on purchasing power of the rupee need to taken up.

DDP and SDP

The estimates of SDP for the commodity producing sectors are generally built up by aggregating the DDP of all districts by the state DES using data on pro-

duction, inputs and prices at the district level. However, for the non-commodity producing sectors, SDP is compiled using state level data from public sector/ private corporate sector and GVA per worker and workforce for the unorganised segments of the economy. For proper synchronisation, it is necessary that the SDP estimates are aggregated from the DDP estimates for all the sectors. This requires generation of requisite districtwise data for the non-commodity producing sectors at least to begin with, on a quinquennial basis. State DES have to evolve a suitable sampling strategy for the state sample so that districtwise estimates could be generated with adequate precision from the follow up surveys of economic censuses.

Prices

Producer prices prevailing in the primary markets/farm gates for agricultural products/collection centres for forestry products and at the landing centres for the fishery products at the district level are being collected through market surveys. However these data are not available for many of the products. For example in case of Karnataka, state level prices are used to value the district production for animal husbandry, forestry and fishing.

The price data for all products, which are important for a particular district, need to be collected and compiled on a regular basis for use in district income estimates. In this regard, it would be necessary for the state income estimation units to first draw up specific lists of such products for each of the districts before initiation of collection of prices.

Yield Rates

Yield rates for some of the agricultural products are neither available at the state/ district levels in the publications on agricultural production. The agricultural departments at the district/state levels are expected to have these yield rates based on eye estimates in their records. These data need to be collected from their records.

Forest Boundaries

The forest circles/divisions/sub-divisions are generally not coterminous with district boundaries. The records of the forest /revenue departments at the division/sub-division/forest range/forest coupe levels will have to be looked into, so as to demarcate forest areas within a district. For example in the case of Madhya Pradesh, the district boundaries are now coterminous with one or more forest divisions.

The price data for all products, which are important for a particular district, need to be collected and compiled on a regular basis for use in district income estimates.

Inputs in Forestry and Fishing

Data on inputs for forestry and logging and fishing are not available even at the national/state level. Ratios developed in the past are being used. Suitable studies in this regard need to be initiated.

Manufacturing - Registered

The sampling strategy in operation from ASI 1998-99 provides serviceable estimates at the all-India and state levels. The states of Assam, Orissa, Rajasthan, Uttar Pradesh and West Bengal, which are participating in the programme of ASI should take steps to augment the size of the sample for the sample (non-census)

sector, so that by pooling the data from the two samples districtwise estimates are generated. For this purpose, the Industrial Statistics Wing of the CSO and the FOD of the NSSO should extend full cooperation to these states in the selection of the sample, collection of field data and processing of data of pooled samples. Other states, that are not presently participating in the ASI programme and are interested in generating districtwise estimates for the registered manufacturing sector to meet the needs of state HDR, may take steps to create resources for augmenting the size of the central sample for the sample sector of ASI.

The allocation of state domestic product for a particular sector in proportion to workforce has the implicit assumption that the value added per worker is the same for all the districts.

Unorganised Segments of Economic Activity

Pooling of central and state samples is a must if the states have to produce districtwise estimates of value added for the unorganised segments of different sectors of non-agricultural economy. The state DES and the Data Processing Division (DPD) of NSSO need to develop and maintain an excellent working relationship. This would help the DPD and the state DES to devise efficient identical data processing procedures for the central and state samples so that pooling of the two samples can be undertaken on a scientific basis.

Workforce

In the case of Karnataka, districtwise workforce (as suggested in the joint methodology developed for DDP by DES Karnataka and DES Uttar Pradesh) has been used to allocate state totals to districts in respect of firewood, unregistered manufacturing, construction, road transport, real estate and business services and other services except education, medical and health and sanitation. Thus the DDP of Karnataka and the HDI for the districts constructed on the basis of the same, ignore the disparity at the district level and do not reflect the extent of development/under-development of the districts of Karnataka.

The allocation of state domestic product for a particular sector in proportion to workforce has the implicit assumption that the value added per worker is the same for all the districts. Such a procedure makes the rich districts less rich and the poor districts less poor. Thus the disparity in income gets reduced and does not reflect the proper picture. As such, its use, to the extent possible, may be avoided.

Value Added per Worker

As in the case of SDP, for compilation of DDP for a particular year, the district level value added per worker, derived from the pooled results of central and state samples of the bench mark surveys of NSSO for manufacturing – unregistered (56^{th} round), unregistered trade (53^{rd} round), informal non-agricultural enterprises (55^{th} round), and unorganised segments of various sectors (57^{th} round), will have to be carried forward or backward using appropriate district level price indices.

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ANNEXURE

Comments on Methodology Adopted by Karnataka, Maharashtra and Tamilnadu for Compiling Distict Domestic Product

Price data for all products, which are important for a particular district, need to be collected and compiled on a regular basis for use in district income estimates.

Main comments on the methodology adopted for compiling the estimates of DDP by the DES of Karnataka, Maharashtra and Tamil Nadu are set out below.

Agriculture, Forestry and Fishing

Districtwise Prices

In the absence of district level prices *DES Karnataka* uses state level prices to value the district production for animal husbandry, forestry and fishing sectors. Such a procedure does not take into account the variation in prices across districts.

Price data for all products, which are important for a particular district, **need** to be collected and compiled on a regular basis for use in district income estimates. In this regard it would be necessary for the state income estimation units at the state levels to first draw up specific lists of such products for each district before initiation of collection of prices.

Yield Rates

For crops for which yield rates are not available for **Karnataka, Maharashtra and Tamil Nadu,** state level estimates are allocated to districts in proportion to area. For **Tamil Nadu,** state level estimates of **forestry** are allocated to districts in proportion to districtwise area under forest. **Such a procedure does not take into account the variation in yield rates as well as prices.**

The agricultural departments at the district/state levels are expected to have these yield rates based on eye estimates in their records. These data need to be collected from their records. Data on forest products also need to be collected at district level

Eye estimates are no doubt subjective but in the absence of yield rates based on objective criteria, these may be good enough for allocation purposes.

Fuelwood

State level estimates are allocated to districts in proportion to rural workforce for **Karnataka** and in proportion to rural/urban population for **Tamil Nadu.**

Inputs in Forestry and Fishing

Data on inputs for forestry and logging and fishing even at the national/state level are not available. DES of **Karnataka, Maharashtra, Tamil**

Nadu as well as DES of other states use ratios developed in the past even for state level estimates. **Input rates vary from state to state.**

Suitable studies in this regard need to be initiated by DES in collaboration with the Chief Conservators of Forest.

Communication and Public Administration

The states of **Karnataka, Maharashtra and Tamil Nadu** allocated state level income in respect of public administration using districtwise workforce. **Tamil Nadu and Maharashtra** also used workforce to allocate state level income from communication to various districts. **Such a procedure ignores disparity in income per worker at the district level.**

Manufacturing – Unregistered and Unorganised Segments of Economy

In case of **Karnataka, Maharashtra and Tamil Nadu,** districtwise workforce has been used to allocate state totals to district in respect of unregistered manufacturing, construction, road transport, real estate and business services, and other services except education, medical and health and sanitation. Workforce has also been used as an indicator by **Maharashtra and Tamil Nadu** for trade, hotels and restaurants. **Thus, the DDP of these states and the HDI for the districts constructed on the basis of the same, ignore the disparity in income per worker at the district level.**

The allocation of state domestic product for a particular sector in proportion to workforce has the implicit assumption that the value added per worker is the same for all the districts. Such a procedure makes the rich districts less rich and the poor districts less poor. Thus the disparity in income gets reduced and does not reflect the proper picture. As such its use to the extent possible may be avoided. Instead it should be used in combination with value added per worker or the appropriate wage rate.

Ownership of Dwellings

State level estimates have been allocated to districts in proportion to number of dwellings by Karnataka, Maharashtra and Tamil Nadu. **Such a procedure ignores variation in rent per dwelling at the district level.**

Districtwise rent per dwelling from NSSO consumption surveys needs to be estimated by pooling the central and state samples. Alternatively, rent per municipal house can be collected from the municipalities.

Districtwise number of dwellings multiplied by rent per dwelling or rent per municipal house would be a better indicator instead of only number of dwellings.

Districtwise rent per dwelling from NSSO consumption surveys needs to be estimated by pooling the central and state samples.