Chapter II

MEASUREMENT OF ECONOMIC GROWTH IN UTTAR PRADESH

1. Introduction

The measurement of economic growth should ideally mean an assessment of the long term productive capacity of the economy and not merely the trends in the current output. The increase in long term productive capacity or the productive potential is governed by the number of factors such as the growth of the working force, improvements in its quality, the stock of capital including natural resources available to the economy, accumulated stock of knowledge and aptitude of the society towards application of this knowledge. A direct measurement of this productive capacity is not possible. It is, however, possible to measure it at least approximately, with the help of the actual output data stretching

over long periods by isolating the effects of short term fluctuations. These short term fluctuations and changes in intensity of resource-use associated with them are generally caused on account of two factors—(i) irregularities in the pressure of aggregate demand, and (ii) effect of natural phenomena like draughts, floods etc. Of the two factors mentioned above, the former is more important for industrially developed economies while the latter plays a crucial role in under-developed agrarian economies where major part of output is derived from the agricultural sector.

Real output data conventionally measured in terms of Real Net National Product or Real Gross National Product is used as a summary statistic for the purpose.

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4 Hereafter referred as Real NNP and GNP only.
of measuring growth of any nation or region.\(^5\) We have also adopted this procedure for measuring and analysing economic growth in the State of Uttar Pradesh, without going into the wider debate on the suitability and inadequacy of NNP or GNP as the true indicator of changes in the economy. Economic growth in the State has accordingly been measured with the help of State income estimates. Thus, before proceeding any further it would

\(^5\) Some of the important studies to be mentioned in this connection are:


(iv) E.F. Denison, Sources of Economic Growth in the United States and the Alternatives Before Us, op. cit.


be better to say a few words about the available income statistics in the State, its concept and the methodology of its preparation.

2. **State Income Estimates**

The earliest attempt to estimate State income in the State was made by S.G. Tiwari. However, Tiwari's main objective was to measure the economic prosperity of the United Provinces (Under British India, Uttar Pradesh was called United Provinces). He estimated income of the United Provinces according to rural and urban sectors for three years namely 1921-22, 1931-32 and 1938-39. Baljit Singh also undertook an exercise to present the economic profile of Uttar Pradesh by making estimates of district incomes for the State. The estimates available from these studies are not usable for the present study as a growth accounting exercise requires series of income estimates for a fairly long period of time. However, Tiwari's study points out to the stagnating nature of the State economy during 1921-22 to 1938-39.

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7 Baljit Singh, *Inter-district Incomes and Economic Profiles of Uttar Pradesh*, Lucknow University, Lucknow, 1974, (Mimeo.).
Preparation of State income estimates at official level and on regular basis is a post-Independence development. It was started in 1948-49 by the Economics and Statistics Division, State Planning Institute, U.P. We have three series of State income estimates prepared by the Directorate of Economics and Statistics, U.P. The first series available covers the period from 1948-49 to 1960-61. The second series called the conventional series extends from 1960-61 to 1972-73. The third series referred as the revised series gives estimates from 1960-61 onwards, latest estimates being available are for 1985-86.

We could not get adequate information regarding coverage, source of data and the method of income estimation for the first series. Hence it has not been used for the purpose of the present study. Between the conventional and the revised series, there are wide variations in the coverage and sources of data. For example,

* Hereafter referred to as DES only.

Work on revised series began in 1967-68 following C.S.O's recommendation to all the States, to follow a uniform pattern of income estimation, so that, the estimates prepared by different States remain comparable to each other. See, Methodology of State Income Estimates of Uttar Pradesh (revised series), State Planning Institute, Economics and Statistics Division, U.P., Lucknow, January 1977, p. 2.
classification of industries in the conventional series lacked the criteria of homogeniety of economic activity under different sectors, a drawback that has been removed in the revised series by a redistribution of economic activity in different sectors. For example, construction activity which was included under public administration in the conventional series has been accorded the status of a separate sector called "construction" in the revised series. The latter series incorporates improvements in the use of reliable and current data and also in the methods of estimation over the conventional series. Some of the important improvements are:

1. Net product from the agricultural sector at constant 1960-61 prices was estimated in the conventional series as the product of the gross value of the reference year at 1960-61 prices and the ratio between net and gross output as obtained in 1960-61. In the revised series, it is estimated by working out inputs of that year at 1960-61 prices and deducting it from the gross value at 1960-61 prices, during the year.

9 Methodology of State Income Estimates (revised series), op. cit. p.3.
2. The method of estimation of income from the construction activity has been changed from 'income approach' in the conventional series to 'expenditure approach' in the revised series.

3. Income generated under the sector electricity gas and water supply which in the conventional series was estimated on the basis of earnings per worker in the construction sector, is estimated in the revised series using the current information available from the annual accounts of State Electricity Board and Local Bodies.

4. Income from private mechanised transport, which in the absence of any data, was estimated in the conventional series, on the basis of per worker earnings in the private non-mechanised transport sector, is estimated in the revised series with the help of data available from various studies for this purpose, undertaken by DES.

5. For estimating income from the sector "other services", the conventional series adopted the procedure of projecting all-India average of income per person in the sub-sectors "other commerce and transport" and
"construction". However, in the revised series income from various services is worked out separately on the basis of data available from various rounds of National Sample Survey and latest data available from various departments and institutions.

6. The method of estimating income from the sub-sector "real estate and ownership of dwellings" has been improved in the revised series by using the information on number of residential houses given in the population Census and information of house rentals available from the Municipal Boards.

It thus appears that not only the revised series is based on much improved sources of data and better methods of estimation compared to the conventional series, it also provides a longer time span for the purpose of the study. Hence the revised series would be used for the present study.

Having decided to use the revised series for the measurement of economic growth in the State we now proceed to examine the concept and methodology as adopted by DES in its preparation. This has been attempted
in the following section. The next section of this chapter deals with measurement of the growth of State income and presents an analysis of its behaviour and trends. The last section summarises main conclusions of the analysis and Appendix A given at the end of the chapter gives details of income estimation under different sectors.

3. Concept and Methodology of State Income

The Economic and Statistics Division, State Planning Institute, claims to follow broadly the same concept for State income as recommended by the National Income Committee and adopted by Central Statistical Organisation for preparing all-India estimates. The basic concept adopted for the final income estimates is that of Net State Domestic Product at factor cost (NSDP) i.e., 'Income Originating' or the home produced income. Thus the State income may be defined as "the volume of goods and services produced during a given period within the geographical boundaries of the State in terms of money". 10

No adjustment for inflow and outflow of goods and services across the State boundaries is made for the lack of relevant data. In this respect "the concept of State income does not strictly correspond to the concept of national income".  

Adoption of the income originating concept though facilitates the computation of State income, it has the dis-advantage of making the estimates less reliable by introducing an element of arbitrariness in computing income from those activities which extend beyond the boundaries of the State like railway transport, banking and insurance etc. where direct estimation is not undertaken. This is because "the institutional characteristics and nature of these sectors neither coincide nor can be usefully defined in terms of geographical boundaries of the State".

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Further, the concept of State income being based on the 'income originating' approach is less conducive for measuring the material welfare of the community in terms of increased goods and services which an index of income is usually conceived of as measuring. It thus "serves only as a measure of economic potential of the State".

As at the national level, lack of requisite data prevents the exclusive use of any single method of computation. Hence all the three approaches namely product, income and expenditure have been used. For the activities extending beyond State territories like railways, state-wide allocation figures provided by C.S.O. are used.

For the purpose of income estimation all economic activities in the State have been grouped under thirteen major heads as given below:

1. Agriculture including animal husbandry

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16 This part relies heavily on the Methodology of State Income (revised series), op. cit., pp.1-49.
2. Forestry and logging
3. Fishing
4. Mining and quarrying
5. Manufacturing (registered and unregistered)
6. Construction
7. Electricity, gas and water supply
8. Transport, storage and communication
9. Trade, hotels and restaurants
10. Banking and insurance
11. Real estate, ownership of dwellings and business services
12. Public administration
13. Other services

For each of the sub-sectors comprising the primary sector i.e. agriculture, forestry, fishery and mining*, production method is used. The method consists in first evaluating gross value of output at the producer's price and then subtracting from it the expenditures on

* However, for the purpose of this study mining sector has been included in the secondary sector instead of the primary sector.
cost items. Due allowance is made for trade and transport margin. To arrive at the figures of net value added, value of depreciation is also subtracted. Value figures in respect of most of the items in the primary sector are current and reliable. However, the cost figures are generally weak. This is because the primary sector is by and large an unorganised sector. Most of the activities under this sector are concentrated in rural areas. Production is generally carried-on on the household basis with the help of family labour, and is not very much geared by profit motive. This combined with illiteracy of the workers, results in the lack of any systematic record of cost incurred in carrying out the production. Hence information on cost items in this sector is rather scanty. Depreciation figures used are also those suggested by CSO. However, attempts are being made to obtain regular cost figures in respect of some important crops and other activities in this sector.

Production method is also used in case of registered manufacturing for which current and reliable data both on value and cost items are available on annual basis. However, in the case of unregistered manufacturing no current data exists, since production in this
sector is usually undertaken in the family based production units. As economic and non-economic activities in this sub-sector are greatly intertwined an accurate measurement of the cost incurred in production becomes difficult. For estimating income in this sector information available from various rounds of National Sample Survey is used.

For estimating net value added from the construction activity expenditure approach is used. The method consists of estimating total expenditure on construction in the State and then bifurcating it into new construction and repair and maintenance. For this purpose total expenditure incurred on pucca construction, kuchha construction and land development etc. in the public sector and private sector, is estimated first. Of the total expenditure on pucca construction, 33.3 per cent is taken to constitute the gross value of the product generated under this sector. In case of kuchha construction and land development, this percentage is taken as 90. Net State Domestic Product from this industry is obtained, after making a 2 per cent allowance for depreciation from the gross value of the product.
In all other (remaining) sectors net domestic output is obtained by using the income approach. For organised segment of these sectors especially that relating to public sector like, Electricity Board, State Road Transport Corporation, State Warehousing Corporation and State Trading Corporation etc. income is estimated on the basis of current information on wages and salaries, interest, rents and operating surplus available from their annual accounts. In case of unorganised segment income is generally estimated as the product of the number of workers and per worker earnings obtained from various rounds of National Sample Surveys and studies undertaken by the DSS at some points of time. Average per worker earnings for other years are obtained by moving the average value of earning in the survey year, with the help of some indicator (for details see Appendix A).

As mentioned earlier for activities of the supra-regional nature like railways, post and telegraphs, banking and insurance etc., which are not confined to the
boundaries of State only, State-wise allocation figures obtained from C.S.O. are used (for methodological details of sectoral income estimation see Appendix A).

4. **Growth of Real Income: Its Behaviour and Trends**

The object of this section is to measure economic growth in the State during the two decades from 1960-61 to 1980-81 with the help of real output series in the State.

4.1 **Problems in Measurement and Choice of Time Period:**

Real output, between any two points of time which are fairly apart, varies on account of two factors: (i) ability of the economy to produce goods and services or its productive potential; and (ii) changes in the ratio of actual production to potential production. 17

Divergence between the rates of these two factors results in short-term fluctuations in actual output.

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series around the potential level, and these short-term fluctuations are likely to overshadow the sustained increase in real output or economic growth—unless the two end years chosen for the comparison of growth have some important basic similarities.

In under-developed agrarian economies, short-term fluctuations are caused by irregular farm output which itself depends on vagaries of monsoon and weather conditions. Measurement of economic growth in them, therefore, requires that the initial and the terminal years should not be much dissimilar in these respects. Our choice of the period 1960-61 to 1980-81 has been guided, firstly by the availability of data, secondly because the two end points do not show any marked dissimilarity in weather conditions, and thirdly because the chosen end points coincide with two Census years namely 1961 and 1981.

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18 Ibid. p.18.

19 "By a sustained increase we mean a rise of such magnitude that is not overshadowed by short-term fluctuations ... If we have evidence of a sizeable movement, relative to the fluctuations over this long period, we can presume that the forces making for economic growth are marked and persistent", Simon Kuznets, *Modern Economic Growth*, IBH Publishing Company, Oxford, Indian Edition, 1972, pp.26-27.
4.2 Growth of Aggregate Real Income in U.P.: With our main objective stated and the time period specified we now present the estimates of real state domestic product and the series of index number prepared with the help of these estimates (Table II.1).

Table II.1: Estimates of Net Real State Domestic Product and Its Indices in Uttar Pradesh at 1970-71 Prices

<table>
<thead>
<tr>
<th>Years</th>
<th>Real SDP*(in crore Rs.)</th>
<th>Index of Real SDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61</td>
<td>3209.85</td>
<td>100.00</td>
</tr>
<tr>
<td>1961-62</td>
<td>3251.40</td>
<td>101.29</td>
</tr>
<tr>
<td>1962-63</td>
<td>3201.62</td>
<td>99.74</td>
</tr>
<tr>
<td>1963-64</td>
<td>3116.61</td>
<td>97.10</td>
</tr>
<tr>
<td>1964-65</td>
<td>3609.94</td>
<td>112.46</td>
</tr>
<tr>
<td>1965-66</td>
<td>3480.40</td>
<td>108.43</td>
</tr>
<tr>
<td>1966-67</td>
<td>3118.15</td>
<td>97.14</td>
</tr>
<tr>
<td>1967-68</td>
<td>3523.22</td>
<td>109.76</td>
</tr>
<tr>
<td>1968-69</td>
<td>3502.05</td>
<td>109.10</td>
</tr>
<tr>
<td>1969-70</td>
<td>3860.76</td>
<td>120.28</td>
</tr>
<tr>
<td>1970-71</td>
<td>4126.91</td>
<td>128.57</td>
</tr>
<tr>
<td>1971-72</td>
<td>3884.99</td>
<td>121.03</td>
</tr>
<tr>
<td>1972-73</td>
<td>4120.40</td>
<td>128.36</td>
</tr>
<tr>
<td>1973-74</td>
<td>3923.14</td>
<td>122.22</td>
</tr>
<tr>
<td>1974-75</td>
<td>4098.96</td>
<td>127.70</td>
</tr>
<tr>
<td>1975-76</td>
<td>4471.31</td>
<td>139.30</td>
</tr>
<tr>
<td>1976-77</td>
<td>4603.16</td>
<td>143.41</td>
</tr>
<tr>
<td>1977-78</td>
<td>5008.97</td>
<td>156.05</td>
</tr>
<tr>
<td>1978-79</td>
<td>5188.67</td>
<td>161.65</td>
</tr>
<tr>
<td>1979-80</td>
<td>4419.52</td>
<td>137.69</td>
</tr>
<tr>
<td>1980-81</td>
<td>5483.13</td>
<td>170.82</td>
</tr>
</tbody>
</table>


* For the reasons that would be explained latter the income generated under the sub-sector real estate and ownership of dwellings and business services has been excluded.
According to Table II.1, real output in the State during the two decades has grown by 70.82 per cent. A closer examination however reveals that the growth experience of the two decades differ considerably. As an instance, real output during the first ten years i.e. 1960-61 to 1970-71 has grown by 28.57 per cent and in the second decade i.e. 1970-71 to 1980-81 by 32.86 per cent.

Table II.1 further shows that the real output has been fluctuating during the entire period, reflecting the underdeveloped nature of the State economy. But, the frequency of these fluctuations is considerably reduced during the second decade. Decline in the frequency of income fluctuation during the second decade shows that the period 1970-71 to 1980-81 witnessed a higher rate of growth and stability as compared to the earlier period of the study 1960-61 to 1970-71. Differences in the growth performance of these two periods

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20 While during 1960-61 to 1970-71, real income in the State economy has fallen five times below its previous level, there are only three such declines during the latter decade 1970-71 to 1980-81.
are clearly revealed in Table II.2 which presents average compound growth rates of the state economy.

Table II.2: Growth Rate of Real Output in the State

<table>
<thead>
<tr>
<th>Period</th>
<th>Growth rate 21 (in per cent per annum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61 to 1970-71</td>
<td>2.54</td>
</tr>
<tr>
<td>1970-71 to 1980-81</td>
<td>2.88</td>
</tr>
</tbody>
</table>

Source: Table II.1.

Growth rates given in Table II.2 show that the real output during the two decades has grown by 2.71 per cent per annum. Growth rate during 1970-71 to 1980-81 happens to be .34 percentage points higher 22 than during 1960-61 to 1970-71.

21 Average compound growth rates have been calculated using the formula \( P_t = P_o \left(1 + \frac{r}{100}\right)^t \) where \( r \) is the rate of growth, \( t \) the value of the time variable and \( P_o \) and \( P_t \) are the values of real output in the base and the final years respectively.

22 Differences in rates of growth measured even in tenths of the percentage points are important from the point of view of their end results. For example, if the national product grows at a rate of 4 per cent than at 3 per cent per annum, at the end of the twenty years it would be 21 per cent larger, and the increase in national product would be 44 per cent. See, E.F. Denison, Sources of Economic Growth in the United States, op. cit., pp.5-6.
4.3 Sectoral Growth: To understand the behaviour of aggregate real output in the economy and the trends revealed by it, a study of sectoral income growth and changes in the structure of real income will be useful. Sectors broadly considered for this purpose are the primary, secondary and tertiary. Indices of real output in different sectors have been presented in Table II.3. Table II.4 and II.5 present the implicit growth rates and percentage distribution of real product by broad sectors of origin.

A significant growth of real income has occurred in all the sectors (Table II.3). If we rank sectors according to their income growth, the secondary sector stands first with a growth of 207.74 per cent during the two decades under study. Second and third positions go to the tertiary and primary sectors respectively.

Primary Sector: Over the twenty years reference period selected for the study, real output in the primary sector has grown at an average compound rate of 1.77 per cent per annum (Table II.4). Rate of growth during
<table>
<thead>
<tr>
<th>Years</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
<tr>
<td>1961-62</td>
<td>98.93</td>
<td>113.17</td>
<td>102.66</td>
<td>101.29</td>
</tr>
<tr>
<td>1962-63</td>
<td>94.19</td>
<td>124.53</td>
<td>104.59</td>
<td>99.74</td>
</tr>
<tr>
<td>1963-64</td>
<td>88.55</td>
<td>134.29</td>
<td>105.05</td>
<td>97.10</td>
</tr>
<tr>
<td>1964-65</td>
<td>106.43</td>
<td>147.44</td>
<td>113.24</td>
<td>112.46</td>
</tr>
<tr>
<td>1965-66</td>
<td>96.30</td>
<td>156.59</td>
<td>114.79</td>
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<td>1966-67</td>
<td>84.50</td>
<td>114.71</td>
<td>113.85</td>
<td>97.14</td>
</tr>
<tr>
<td>1967-68</td>
<td>102.90</td>
<td>135.88</td>
<td>118.14</td>
<td>109.76</td>
</tr>
<tr>
<td>1968-69</td>
<td>100.40</td>
<td>138.78</td>
<td>128.93</td>
<td>109.10</td>
</tr>
<tr>
<td>1969-70</td>
<td>113.89</td>
<td>160.04</td>
<td>129.26</td>
<td>120.28</td>
</tr>
<tr>
<td>1970-71</td>
<td>117.31</td>
<td>181.43</td>
<td>137.07</td>
<td>128.57</td>
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<tr>
<td>1971-72</td>
<td>106.26</td>
<td>176.95</td>
<td>139.24</td>
<td>121.03</td>
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<tr>
<td>1972-73</td>
<td>113.12</td>
<td>190.29</td>
<td>144.89</td>
<td>128.36</td>
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<tr>
<td>1973-74</td>
<td>104.96</td>
<td>190.49</td>
<td>141.95</td>
<td>122.22</td>
</tr>
<tr>
<td>1974-75</td>
<td>112.90</td>
<td>181.87</td>
<td>146.90</td>
<td>127.70</td>
</tr>
<tr>
<td>1975-76</td>
<td>123.57</td>
<td>201.15</td>
<td>157.31</td>
<td>139.30</td>
</tr>
<tr>
<td>1976-77</td>
<td>124.68</td>
<td>218.18</td>
<td>164.90</td>
<td>143.41</td>
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<tr>
<td>1977-78</td>
<td>135.58</td>
<td>246.06</td>
<td>174.69</td>
<td>156.05</td>
</tr>
<tr>
<td>1978-79</td>
<td>136.87</td>
<td>271.03</td>
<td>183.98</td>
<td>161.65</td>
</tr>
<tr>
<td>1979-80</td>
<td>102.04</td>
<td>279.99</td>
<td>177.74</td>
<td>137.69</td>
</tr>
<tr>
<td>1980-81</td>
<td>142.05</td>
<td>307.74</td>
<td>191.54</td>
<td>170.82</td>
</tr>
</tbody>
</table>

Source: Bulletin No. 175 and 199, Economics & Statistics Division, State Planning Institute, Lucknow, UP.
### Table II.4: Growth Rates of Real Output in Different Sectors

<table>
<thead>
<tr>
<th>Period</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
<th>All sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61 to 1980-81</td>
<td>1.77</td>
<td>5.78</td>
<td>3.30</td>
<td>2.71</td>
</tr>
<tr>
<td>1960-61 to 1970-71</td>
<td>1.61</td>
<td>6.14</td>
<td>3.20</td>
<td>2.54</td>
</tr>
<tr>
<td>1970-71 to 1980-81</td>
<td>1.93</td>
<td>5.43</td>
<td>3.40</td>
<td>2.88</td>
</tr>
</tbody>
</table>

Source: Table II.3.

### Table II.5: Percentage Distribution of Real Output by Sectors of Origin

<table>
<thead>
<tr>
<th>Period</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
<th>All sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61 to 1980-81</td>
<td>60.36</td>
<td>16.27</td>
<td>23.37</td>
<td>100.00</td>
</tr>
<tr>
<td>1960-61 to 1970-71</td>
<td>63.25</td>
<td>14.36</td>
<td>22.39</td>
<td>100.00</td>
</tr>
<tr>
<td>1970-71 to 1980-81</td>
<td>58.26</td>
<td>17.62</td>
<td>24.12</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: Same as Table II.1.
the second decade 1970-71 to 1980-81 is .32 percentage points higher compared to the growth rate during the earlier decade 1960-61 to 1970-71.

It is apparent from Table II.3, that real output of this sector has fluctuated throughout. But, the frequency of these fluctuations is reduced during the second decade, for, there are only three years during this period when output has declined relative to its previous level whereas during 1960-61 to 1970-71 this phenomenon extended to six years. This shows that with the increasing use of high yielding variety of seeds, chemical fertilizers, better irrigation facilities and improved farm practices such as crop-mixing, crop rotation and cropping intensity during the second decade (1970-71 to 1980-81), real output in agriculture, the major sub-sector of the primary sector, has counteracted to quite an extent the adverse effects/natural climatic conditions like weather and monsoon. Relative stability obtained during the latter decade may therefore be viewed as a significant change during thirty years of planned development.
A marked similarity in the behaviour of output is observed between the primary sector and the economy as a whole (Table II.3, col.1 & 4). Except the year 1961-62, change in total real output in the State economy has closely followed changes in the output of the primary sector. The reason, as Table II.5 shows, the sector contributed the largest share of the total real product — more than 60 per cent over the twenty years period (1960-61 to 1980-81). Due to its largest share, a small change in the output of this sector is likely to produce a greater effect in the total output of the economy in comparison to the other two sectors namely secondary and tertiary whose contributions to the total real product have been relatively small. And, it is for the low growth rates observed in the primary sector during 1960-61 to 1980-81 (1.77 per cent per annum) that the overall growth of the economy remained

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The average growth rate of total real product in the economy may be looked upon as the weighted sum of the sectoral growth rates, weights being the shares of the three sectors in the aggregate real product. See, B.H. Dholakia, Sources of Economic Growth in India, op. cit., p. 21.
as low as 2.71 per cent per annum, though relatively higher growth rates were observed in the other two sectors.

**Secondary and Tertiary Sectors:** During the twenty years reference period (1960-61 to 1980-81) secondary and the tertiary sectors have grown at annual compound rates of 5.78 and 3.30 per cent respectively.

Analysis of the growth pattern of these two sectors shows that there have been fluctuations in the output of these two sectors also. But, the magnitude and frequency of fluctuations has not been as large as in the case of the primary sector. In case of the secondary sector, output has gone down four times (twice during each decade), while in case of the tertiary sector it has gone down once in the first decade, and twice in the second decade. Thus, growth in these two sectors has been relatively steady compared to the growth in the primary sector. While both sectors have grown during the reference period, a matter of great concern is that there has been a decline in the growth rate of the secondary during the second decade 1970-71.
to 1980-81 as compared to 1960-61 to 1970-71 while the tertiary sector has improved its growth rate by .20 percentage points during the same period.

4.4 **Structure of Real Income**: The structure of real income reveals a decline of 4.99 percentage points in the share of the primary sector during 1970-71 to 1980-81 in comparison to its percentage share during 1960-61 to 1970-71 (Table II.5). Percentage shares of both secondary and tertiary sectors mark an increase 1.26 and 1.73 percentage points during the second decade as compared to their respective shares during the first decade.

A shift in the structure of real income, with a gradual decline in the percentage share of the primary sector and increase in the shares of secondary and tertiary sectors is a common feature of economic development. It is noteworthy however, that the share of the commodity producing sector\(^{24}\) has declined during the

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\(^{24}\)Share of the commodity producing sector is obtained by adding the shares of primary and the secondary sector.
latter decade (1960-61 to 1970-71). While this seems to have occurred due to the slow-down in the growth rate of the secondary sector during 1970-71 to 1980-81, expansion of the service sector with a decline in the share of the commodity producing sector can not be regarded as conducive to the balanced development and is likely to have flared up the rate of inflation in the economy.

4.5 Further Analysis of Growth of Real Output: The decadal growth performance, however fails, to bring out the process of growth of the State economy. It can be seen from Table II.1 that the index of real output reveals a zig-zag movement and registers a dismal growth up to 1966-67. However, it shows a sustained increase since 1974-75 except for a fall during 1979-80 which was a bad agricultural year. As the new agricultural technology or the High Yield Variety programme was introduced in the State in the mid-sixties, it can be generally presumed that a positive change started
occurring in the economy by 1967-68. \(^{25}\) Hence a study of the growth performance of the State economy with two break-in points at 1967-68 and 1974-75 seems appropriate. Growth rates calculated for the three sub-periods 1960-61 to 1967-68, 1967-68 to 1974-75 and 1974-75 to 1980-81 for the aggregate and sectoral incomes have been presented in Table II.6.

**Table II.6 : Average Growth Rates of Real Income in U.P.**

<table>
<thead>
<tr>
<th>Period</th>
<th>All sectors</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-61 to 1967-68</td>
<td>1.34</td>
<td>.41</td>
<td>4.48</td>
<td>2.41</td>
</tr>
<tr>
<td>1967-68 to 1974-75</td>
<td>2.19</td>
<td>1.33</td>
<td>4.25</td>
<td>3.16</td>
</tr>
<tr>
<td>1974-75 to 1980-81</td>
<td>4.97</td>
<td>3.90</td>
<td>9.16</td>
<td>4.52</td>
</tr>
</tbody>
</table>

Source: Table II.3.

\(^{25}\) While the year 1966-67 marks the end of the pre-HYV period, being a severe drought year in the State, it does not provide a satisfactory basis for computing compound growth rates which are sensitive to the choice of the end-points. Moreover, the new agricultural technology which was introduced in June 1965 is likely to have taken some time to show up some significant results. The choice of 1967-68, as a break-in point seems reasonable in this respect.
As the apriori reasoning suggests, growth rates during 1967-68 to 1974-75 are .75 percentage points higher compared to the growth rates during 1960-61 to 1967-68 and growth rates during 1974-75 to 1980-81 are 2.78 per cent higher compared to the rates during 1967-68 to 1974-75. It appears therefore, that the State economy which experienced a negligible growth up to 1966-67 started looking up from 1967-68 onwards. However, a real stride seems to have come since 1974-75 which is manifested in the high growth rates during 1974-75 to 1980-81 and also thereafter.26

Except the secondary sector where growth rates during 1967-68 to 1974-75 declined in comparison to the rate during 1960-61 to 1967-68, other two sectors of the economy namely primary and the tertiary reveal considerable improvement in their growth since 1967-68.

26Viewing the performance of the State economy during the Fifth and Sixth Plan periods, it is now generally believed that the State economy has picked up the momentum of growth since 1974-75. See, (i) A.K. Singh, Uttar Pradesh Economy: Poised for Rapid Growth, The Economic Times, December 19, 1986, and (ii) T.S. Papola, and Fazimuddin, "Industrial Spurt in Uttar Pradesh: Myth or Reality?" The Economic and Political Weekly, February 16, 1985, pp. 269-273.
Growth rates in the primary sector during 1967-68 to 1974-75 are 0.92 percentage points higher compared to the growth rates during the pre-HYV period i.e., 1960-61 to 1967-68. With the spread of green revolution and farmers response to new agricultural technology, growth rate in this sector showed further improvement during 1974-75 to 1980-81 being 2.57 per cent higher than during 1967-68 to 1974-75.

In case of tertiary sector also growth rate during 1967-68 to 1974-75 reveal an improvement of 0.72 percentage points over that during 1960-61 to 1967-68. Growth rate during 1974-75 to 1980-81 is 1.36 per cent higher as compared to that during 1967-68 to 1974-75; improvement during 1974-75 to 1980-81 being 2.57 per cent points than during 1967-68 to 1974-75.
It is indeed encouraging to find out spurt of growth in the secondary sector during 1974-75 to 1980-81. The sector has improved its growth rate by 4.91 percentage points during 1974-75 to 1980-81 over that experienced during 1967-68 to 1974-75.

4.6 Conclusions

Main conclusions emerging from the above analysis are:

1. During the twenty years period as a whole, real product in the State has grown at an average compound rate of 2.71 per cent per annum.

2. The rate of growth was phenomenally slow upto 1967-68. But, from 1967-68 onwards, the graph of growth started rising up, and after 1974-75, it shows an encouraging and steady upward trend.

3. Throughout the two decades 1960-61 to 1980-81, real output in the State has been dominated by the behaviour of output in the primary sector.


6. The State economy has experienced a shift in sectoral output in favour of the tertiary sector during the second decade. To some extent relative gain of the tertiary sector has been due to the decline in the growth rate of the secondary sector. This phenomenon, does not indicate a healthy trend for the State economy and calls for strengthening the industrial sector.

7. Despite a gradual decline in the percentage share of the primary sector in total real product during the twenty years under study, more than half of the total output still originates in this sector. Thus, given its structure, not much improvement in the overall growth rates of the economy can be expected, unless the rate of growth of the primary sector improves appreciably.
Appendix A

For the purpose of computation of State income all the economic activities in the State have been classified under 13 major heads as mentioned in the text earlier. The method of income estimation and data base in each of these sectors is given below.

Agriculture (including Animal Husbandry)

Net value of output in this sector is obtained by subtracting from the gross value of output, cost of all the inputs including depreciation incurred in the production. Gross value from this sector is obtained separately for crop production and animal husbandry. However, as agriculture and livestock activities are usually carried out together, the two subsectors are treated as one for the purpose of estimating total cost of input.

Gross output in agriculture is first worked out in physical terms by using area and out-turn figures supplied by the Directorate of Agriculture/Board of Revenue U.P. Gross value is then worked out by
multiplying the gross output figures by the corresponding weighted average prices relating to the post-harvest peak marketing period. Adjustments are also made for the rice milling charges and higher and lower value of procured food grains.

For most of the crops, area figures are available but out-turn figures are not. These crops for which out-turn figures are not available, are evaluated on the basis of information on average yield of some other specified crops for which out-turn figures are available. This of course introduces an element of guess-work in estimation. However, area and production figures for major crops being available, gross output estimates for this sector are fairly reliable.

Gross output from animal husbandry, is estimated on the basis of quinquennial livestock censuses in the State. Gross output for different products, is estimated by multiplying number of animals in each category, by the average yield per animal provided by State Directorate of Animal Husbandry/Directorate of Marketing and Inspection or Central Statistical
Gross output is then evaluated using prices of these products, after making due allowance for trade and transport margin and rural-urban price variations. Estimates of number of animals of the relevant categories for the inter-censal years, are obtained by interpolating the benchmark estimates, assuming a constant geometric rate of growth.

To arrive at the net value added from crop production and animal husbandry sector, certain deductions for cost of inputs like seeds, manures, cost of livestock feed, insecticide, pesticide, diesel oil, irrigation charges, current repair and maintenance etc. are made from the gross value of the output (crop production and animal husbandry). In the absence of any record of expenditure on cultivation no firm and current data on cost items are available at the State level. Cost estimates provided by C.S.O. are used. However, attempt is made to use the revised rates to various items of inputs on the basis of latest available information.

Hereafter referred as C.S.O. only.
Forestry

Production method is used for this sector also. For official exploitation of major forest products, out-turn and prices are available from the State Forest Departments. These prices are duly adjusted for trade and transport margins before using them for evaluation. Value of gross output so arrived is inflated by 10 per cent to account for unauthorised exploitation. As no out-turn figures in case of minor products (except bamboo) are available, their value is estimated in terms of royalty.

In the absence of data on cost of inputs and depreciation for this sector in the State, a certain percentage, as suggested by C.S.O, is deducted, to arrive at the net value added.

Fisheries

Income from this sector is estimated, on the basis of data supplied by State Fisheries Department. The department provides data on total production of fish as well as prices. Weighted average wholesale prices of different varieties of fishes are used.
Since no data on cost of fishing in the State are available deduction rates suggested by C.S.O. are used.

**Mining and Quarrying**

As mining in the State is mostly in the nature of an organised activity, current and reliable data are available both for prices and output. In case of major minerals, these figures are obtained from the Director of Geology and Mining. For mining in the unorganised sector, information available from reports of National Sample Survey is utilised. To arrive at net value added in this sector, deductions for cost and depreciation are made on the basis of rates suggested by the Indian Bureau of Mines, Nagpur.

**Manufacturing**

For the purpose of income estimation manufacturing sector has been divided under two subsectors (i) registered manufacturing, and (ii) unregistered manufacturing.

**Registered Manufacturing**: For estimating output from this sector fairly reliable and current data on output, input, depreciation etc. are available from the Annual
Survey of Industries. Using these data net value is obtained as total output - (total input + depreciation). The figure arrived is adjusted for imputed banking charges provided by the C.S.O.

Unregistered Manufacturing: Due to extreme dearth of relevant data state level income estimation for this sector was not undertaken upto 1977-78. Percentage share of this State (10.86) in the unregistered manufacturing sector for all-India in 1960-61, was adopted for other year also. However since 1978-79, estimates are prepared at the state level. For this purpose all the manufacturing units in this sector have been grouped under 10 major industry groups. Estimates of gross value added for the non-household sector in 1974-75, are obtained directly from the C.S.O. and are based on the data available from the centrally sponsored scheme on Survey of Small Scale Industries (CSSI) and all-India Report on the Census of Small Scale Industrial Units published by the Development

2The ASI data on complete enumeration basis are available from 1967 onwards only. Hence for years prior to 1967 net value added were obtained by adding estimates of Census sector and sample sector for this State from NSS reports". See, Methodology of State Income Estimates of Uttar Pradesh (revised series), State Planning Institute, Economic & Statistics Division, Lucknow (January 1977), p.25.
Commissioner Small Scale Industrial Units. Estimates of gross value added for the household sector are based on the NSS-29th Round.  Estimates for household and non-household sector for 1974-75 are added. These are adjusted for the consumption of fixed capital at the rates suggested by C.S.O. and are moved to other years with the help of physical indicators of output/input. Constant price estimates so derived are converted to current prices with the help of price indices of relevant commodity groups and are corrected with the help of an adjustment factor.

Construction

This sector includes all the construction, repair and maintenance and demolition work in the State carried out by Government (Central and State), departmental and non-departmental commercial undertakings and the private sector.


4 The adjustment factor has been prepared with the help of State estimated figure and CSO estimated figure for this sector in U.P. in the year 1977-78. See, State Income Estimates, Bulletin No. 199, Economic & Statistics Division, State Planning Institute, U.P., p. 34.
For evaluation of value added by the construction activity expenditure approach is used. The method consists in estimating the total expenditure on construction and on (ii) expenditure on repairs and maintenance. A certain proportion of total expenditure is taken as value added by the construction activity. This proportion is different for kuchha and pucca construction as well as for new construction and repair and maintenance. To arrive at net value added deduction is made for depreciation.

Data base for estimating value added from this sector is not very firm. Although figures of expenditure on construction undertaken by Central Govt., State Govt. and local bodies are available, there are problems in estimating expenditure on construction by some departmental and non-departmental undertakings whose activities extend to many States such as Post and Telegraph, Railways, Life Insurance Corporation etc. Expenditure incurred by these establishments is either obtained from C.S.O. or is culled from their annual accounts.

No current data on household expenditure on construction either in the rural or in the urban sector are available.
For rural household sector bench mark estimates of expenditure per person on pucca and kuchha construction obtained from the studies carried out by State Statistical Bureau at different points of time. These are interpolated and extrapolated to obtain estimates for other years and are multiplied by mid year annual population. The figures obtained are deflated by the index of wages, of rural unskilled labour to arrive at figures of total expenditure on construction by the rural household sector.

For urban household construction also, current data do not exist. Same method of moving forward and backward estimates of per household expenditure on pucca and kuchha construction available from NSS Reports and studies undertaken by SSB is adopted. The figures are multiplied by number of urban households and deflated

5(i) Capital Formation by Households in Rural Areas of Uttar Pradesh (1959-60); and


6Hereafter referred as SSB only.

with the wage indices of rural skilled labour to arrive at total expenditure on construction in different years.

**Electricity, Gas and Water Supply**

Value added in this sector is obtained by using income approach. In case of electricity estimates of factor incomes are obtained from the annual accounts of UPSEB. For private companies and municipal corporations in this sector, state level data is not available. Value added for them, is therefore obtained on the basis of sale of energy by these units, in the State.

Income from water supply, is obtained on the basis of wage and employment data, available from the municipalities. Compensation to employees is estimated on the basis of this data. For other factor incomes, figures are culled from annual survey of industries.

In case of gas, value added in this State is taken as negligible.

**Transport, Storage and Communication**

From the point of view of income estimation, economic activities in this sector have been classified under

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8 Uttar Pradesh State Electricity Board.
three heads viz. (i) Transport, (ii) Storage, and (iii) Communication. Separate estimation for each activity is undertaken by using income method.

Transport includes railway transport, road transport (mechanised and non-mechanised), air and water transport and services incidental to transport like packing, crating, travel agency services etc.

For railway transport no estimation is undertaken at the State level. State-wise allocation\(^9\) figures supplied by C.S.O. are used.

SDP from mechanised and non-mechanised road transport is estimated separately. In case of public sector current data are obtained from State Road Transport Corporation, U.P. No current data on mechanised road transport in the private sector are available. Income is estimated by using the information available from NSS report.\(^10\) Value added per worker for rural and urban


\(^10\) NSSO-29th Round, op. cit.
sectors obtained from the report for 1974-75 are moved to other years with the help of the index of wages of rural skilled labour and consumer price index of urban skilled labour. These figures are multiplied by the working force engaged in mechanised road transport (bench mark estimates are moved to other years with the help of number of vehicles on road).

In case of non-mechanised road transport studies undertaken by Economic and Statistics Division, SPI are relied upon.

For water transport and services incidental to transport, the only information available is the number of workers. Average earnings per worker in this sector are taken to be the same as in the non-mechanised road transport.

In case of air transport also data coverage is incomplete. Information provided by Hind Flying Club and Indian Air Lines is used.

**Communication**

In case of communication also no estimation at State level is undertaken. Value added figures as supplied by C.S.O. are adopted.
Storage

For warehousing and cold storage net-domestic product is obtained using current data on factor incomes available from State warehousing corporation U.P. and Annual Survey of Industries.

Trade, Hotels and Restaurants

All the wholesale and retail trading activities including export, import and auctioneering come within the purview of this sector.

Income method has been used for those wholesale and retail traders who are assessed for the purpose of income tax. Data on number of trading units and their incomes are obtained from the income tax department.

For all the trading units not registered for the purpose of income tax gross income per worker is obtained on the basis of NSS report. Per worker values are multiplied by number of workers engaged in these trading activities. Depreciation at the national level is deducted to arrive at the net value added.
Banking and Insurance

For most of the banking and insurance services, state-wise allocation figures supplied by CSO are used. For the financial institutions whose activities are of localised nature, factor incomes are estimated by the analysis of their annual accounts.

Real Estate and Ownership of Dwellings

This sector includes activities of real estate dealers and the income originating from the ownership of residential dwellings.

In case of ownership of dwellings per person rental in the urban sector for 1967-68 given in SSB report is moved to other years with the help of year-wise rental value per residential house for the municipal houses. There being no reliable data for the rural sector, rental per person in rural area is taken as 1/3 of the urban areas. The estimates are multiplied by the number of Census houses in urban and rural sectors separately and added to get the gross rental from ownership of dwellings. Number of houses during inter-censal

11 Uttar Pradesh Me Awason Ki Dasha 1967-68, Bulletin No. 139, SSB.
years are obtained by interpolation and extrapolation assuming geometric rate of growth. Current and reliable data on cost of maintenance and repair is also not available. Hence, percentages as at the national level are used.

For real estate SDP in 1960-61 for this sector was obtained from CSO. This allocation to the state was based on the basis of working force. For other years net product per worker in real estate is moved forward with the help of index of annual average earnings of factory worker. These figures were multiplied by the projected number of persons in real estate. The product gave estimates of SDP for real estate at current prices.

Estimates of ownership of dwellings and of real estate, are added together to give the SDP from this sector.

Public Administration

SDP from this sector is the total of wage and salaries, honoraria (excluding travelling allowance) pension, employers contribution to provident fund and all wage supplements in cash or kind.
For the administrative services of the Central Government data is obtained from CSO. For State Government, estimates of expenditure on wages and salaries is obtained from their budget accounts. As expenditure on administrative staff alone is required, expenditure on wages and salaries of the government staff engaged in other commercial undertakings such as railway, education and health etc. is subtracted from it.

Estimation of SDP for Local Bodies is based on the analysis of their annual accounts.

**Other Services**

This sector includes education, research, medicine, sanitary, religious and community services, legal services, recreation and entertainment services, personal service and services not specified elsewhere.

To facilitate income estimation all the activities in this sector have been regrouped under four groups viz. (i) education and research, (ii) medical and health, (iii) sanitary services, and (iv) all other services. The method has been to estimate SDP for each group, as a product of per head earning in the group and the working force. SDP for each group is added to get the final estimate of SDP from this sector.