

Estimation of National Income in Pakistan*

1. INTRODUCTION

The following note is a description of the method of estimating national income in Pakistan. Such description is not currently available in a general publication, and it is presented here for the benefit of research workers who make use of Pakistan national income data. It is emphasized that this note is a description only, and no attempt is made to analyze the data or to comment on the appropriateness of the methods or the implications of the method for the validity of the estimates. For aid in presentation a table of national income estimates is also included (see page 88).

2. METHODOLOGY

National income of a country may be measured or estimated by the application of three different methods, viz., (a) product method, corresponding to the concept of net national product; (b) expenditure method, corresponding to the concept of net national expenditure; and (c) income method, corresponding to the concept of the sum of the distributive shares. Ideally estimation of national income will require a country to measure its national income or net national product by the application of all these three methods as separate tools of economic analysis as well as a means of cross-checking the individual estimates for purposes of ascertaining accuracy.

Estimation of national income by any of the methods in toto or by all of these methods separately pre-supposes the existence of sufficiently abundant and reasonably accurate basic statistical data. The present state of availability of statistical data in Pakistan does not provide all the necessary information required for the compilation of statistical estimates of national income by all these methods. The estimates of Pakistan's national income are thus necessarily based on the combination of more than one method. Although, the approach chiefly follows the pattern of product method, the internal component entries have been made by income method at different stages, where no reasonably accurate estimates by product method could be made.

The estimates have been based on the classification of the whole economy into a number of industrial sectors. Needless to say, a clear-cut classification of the economy into mutually-exclusive industrial sectors is dependent on

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clear-cut specialisation of activity of different economic groups. In the absence of such a clearly-specified economy, the customary classification of the total income by industrial origin could not be applied. The classification pattern of Pakistan's estimates is, therefore, simply an approximation to a classification that, from the stand-point of economic analysis, would be most desirable classification. For purposes of national income estimation, the economy of Pakistan has been classified into the following industrial sectors:

1. Agriculture, including major agricultural crops, minor agricultural crops, livestock, fisheries, and forestry;
2. Mining;
3. Manufacturing, including large-scale and small-scale industries;
4. Government;
5. Banking;
6. Transportation and Communications;
7. Services, including Construction;
8. Rental Income;
9. Wholesale and Retail Trade;
10. Indirect Taxes on Export;
11. Factor Income Payments;
12. Effect of Terms of Trade.

3. VALUATION

(A) Market Prices or Factor Costs

Since income is computed in money terms, the evaluation of the product can be done either at market prices or at factor costs. The earlier approach values goods and services at market prices which obviously will include indirect taxes and exclude subsidies. And the latter excludes indirect taxes and includes subsidies. National income estimates of Pakistan are valued at factor costs.

(B) Constant or Current Prices

National income is usually estimated both by constant prices and by current prices. In the former case, a base period is chosen and the price prevailing in that period are used for valuation of the product for all succeeding years. In the latter case, the valuation is done by the prices prevailing in the current period. Pakistan's national income estimates are based on constant prices except in particular cases to be noted. The average of prices during the period 1949-50 to 1952-53 has been used in the computation of the constant series.

4. ESTIMATION

A brief description of the methods of estimation of income of the various sectors of National Income is given below:

(A) Agriculture

The whole sector of agriculture has been sub-divided into the following five sub-sectors:

- (i) Major Agricultural Crops;
- (ii) Minor Agricultural Crops;
- (iii) Livestocks;
- (iv) Fisheries;
- (v) Forestry.

Incomes of these sub-sectors have been estimated separately. Essentially the method used for these sectors is based on the value-added approach, with slight modifications and minor lapses at places where statistical data for the use of the conceptual method were not available.

(i) *Major Agricultural Crops*

This sub-sector estimates the income generated in the economy by the production of major agricultural crops, both food and non-food, such as wheat, rice, jute, cotton, etc.

Production of all these crops have been multiplied by the harvest prices of the respective crops. Production figures used are those which relate to the estimates of crops made at the time of harvesting. Production data of each of the crops have been collected separately by districts of the pre-unification provinces. The district-wise production figures have been totalled to arrive at the provincial total and the provincial totals have then been added to get the national total, The prices of all these crops have also been collected by

districts. The district-wise prices have been averaged on the basis of district-wise production weightage. The provincial average prices for all the four years between 1949-50 to 1952-53 have also been averaged to get an average price for the four-year base period on the basis of the yearly production. The provincial production figures have been multiplied by the weighted average prices. These provincial value figures have then been added together to get the national figures of gross value of production. In some cases, harvest prices being non-available, wholesale prices have been deflated by 20 per cent to get an estimate of the harvest prices.

This value has been converted into net value by making the following deductions: 5 per cent for seeds, 3 per cent for wastage for cereals and 1 per cent for wastage for non-cereals and 5 per cent for maintenance repairs and depreciation of agricultural implements and farm buildings, *etc.* These deductions have been made for individual crops separately.

It should be pointed out here that no deduction has been made on account of purchase of fertilizers and depreciation of animal draught-power due to non-availability of relevant information.

(ii) *Minor Agricultural Crops*

The technique of compilation for deriving both gross and net value is the same as that of major agricultural crops.

(iii) *Livestock*

The contribution of the livestock sub-sector has been estimated on the basis of the quantity of production of various kinds of livestock products multiplied by their respective producers' prices. The production data used are those estimated by the Co-operation and Marketing Department by provinces. The greatest difficulty was the non-availability of price data. Wholesale prices have been available for some scattered centres and varying ratios of deflation have been used to arrive at the producers' prices. Simple average of the available centre-wise wholesale prices has been made for a single-commodity average price. The ratios of deflation are as follows:

The wholesale prices of buffalo and cow milk has been deflated by 25 per cent and the wholesale price of goat milk have further been deflated by 10 per cent. The wholesale prices of meat, fowls and ducks, birds and skins were deflated by 20 per cent and that of wool by 25 per cent. These deflations have been done on the basis of information gathered through isolated market surveys. The values of other products have been adopted as such from the publication entitled *Livestock Wealth of Pakistan* relating to

the year 1948-49 issued by the Co-operation and Marketing Department and the same were repeated for the years 1949-50 to 1952-53. In the absence of data for livestock products subsequent to 1952-53, no fresh estimates for those years could be made and as such the estimate pertaining to the year 1952-53 is being repeated for all subsequent years.

Two points have to be borne in mind:

First, the estimate under this sub-sector relates to gross value of products as no deduction on account of the various inputs of expenses on fodder and animal feeds for rearing of the livestock has been made.

Second, the valuation does not include the production of fertilizer; and as such, it is an under-estimate. However, the overall contribution of the agricultural sector including contribution by the major and minor crops and livestock remains the same. Of course, the contribution of the livestock sector in the form of dung fuel remains unaccounted for anywhere.

(iv) *Fisheries*

The contribution of fisheries has been estimated on the basis of production of fish in East and West Pakistan and the retail prices for East Pakistan and wholesale prices for West Pakistan. The retail prices obtained from various urban centres of East Pakistan have been averaged and deflated by 40 per cent and then a further deflation of 30 per cent has been made for rural areas to arrive at fisherman's price in East Pakistan. The two prices thus obtained—one for the urban and the other for the rural—have been adjusted on the basis of estimated production for those two areas. The basis of estimation is pure guess made by a study of consumption level of the respective areas. In the case of West Pakistan, wholesale prices were available for the former provinces of Punjab and Sind including Karachi and Baluchistan State Union. These were deflated by 10 per cent to obtain fisherman's prices. The fisherman's prices for the former Punjab were further deflated by 20 per cent to arrive at fisherman's price for the former Northern Frontier Provinces. These area-wise prices have then been averaged. No weighting of the zonal prices has been done. Simple arithmetical average has been worked out. In order to obtain net value of fisheries a deduction of 5 per cent was made from the gross value as an allowance for depreciation of boats, nets, etc.

(v) *Forestry*

The estimates under this sub-sector are based on the value of forest

products reported by the Chief Conservator of Forests, East and West Pakistan. The data available on forest product relate only to government-owned forests. No information regarding the value of products of private forests is available and as such the contribution of forestry is an underestimate.

No deduction on account of material input has been made and the estimate is an over-estimate on this score.

(B) Mining

The contribution under this sector is estimated on the basis of production of different minerals and their pit-head/well-head prices, excluding royalties. The prices are the average of 1949-50 to 1952-53. In order to obtain net value, deductions have been made from gross value to allow for wastage, depreciation and cost of materials. A deduction of 5 per cent was made for Coal, 4 per cent for Limestone, Gypsum, Chromite, Fire Clay and Silica Sand, 3 per cent for Celestite and Ocheres, 1 per cent for Clay, 2 per cent for Fuller Earth and 7 per cent for Building Stone and Road Metal, *etc.*

(C) Manufacturing

In the absence of basic statistical information, the estimate for this sector has been based on the following method. At first an estimate for the whole sector covering both large-scale and small-scale sectors has been prepared. An estimate for the large-scale sector has been prepared independently. This estimated figure has then been deducted from the total estimate for the whole sector to obtain the contribution of the small-scale sector.

The technique for the estimation of the contribution of the sector as a whole is more nearly an income method than in the case of agriculture. On the basis of 1951 Population Census reports number of people engaged in each industry of the manufacturing sector has been estimated. This number has then been multiplied by an assumed rate of annual income for each type of worker engaged in manufacturing in 1951. The rate of income assumed has been estimated by consultation with various official and non-official agencies, reference to income tax data and other isolated wage surveys as could be found. The total of such incomes has given the estimate of total income for this sector. It is to be noted that the total income thus estimated has been based on the basic data of 1951 and as such the base year in this case is 1951 and not 1949-50 to 1952-53.

(i) Large-scale manufacturing

The estimate for this sub-sector has been based on the 1954 Census of

Manufacturing Industries data. The 1954 CMI value-added figure has been adjusted by an average wholesale price index for the years 1949-50 to 1952-53. This adjusted figure has then been further adjusted by an annual index of industrial production for estimates of earlier and later years. Both of the indexes—price index and industrial production index—have been applied to the total value-added figure and not to those of the individual groups of industries.

(ii) *Small-scale manufacturing*

As stated above, the estimate for this sub-sector has been obtained by subtracting the income of large-scale manufacturing from the total income for the whole sector. The residual has been assumed as the income for the year 1951-52 and the estimates for other years have been made by extrapolating the basic figure by the rate of population growth, assuming that the number of persons engaged in small-scale industries has increased exactly by the same ratio of population growth, and per capita real incomes have remained constant.

(D) **Government**

An imputed value is allocated to government product. The contribution of this sector is measured on the basis of wages and salaries paid to the employees of the Central, Provincial and Local Governments as derived from their respective budgets. The estimates of income under this sector are at current prices, as the wages and salaries covered by this sector are paid to government employees in current money terms.

(E) **Banking and Insurance**

This sector includes financial institutions such as banks, insurance companies and cooperative credit societies. The method of assigning imputed value to the product of the financial institutions has been used. The estimate of banking includes wages and salaries paid to the employees and the operating surplus of the scheduled banks. No imputed charges for banking services received from other sectors are deducted.

The estimates for insurance are computed on the basis of wages and salaries paid to employees and the commission received by the commission agents.

The estimate for the cooperative credit societies is also done on the basis of wages and salaries and operating surplus. The valuation of the estimates for this sector is based on the current prices. The estimate under

this sector does not cover the non-scheduled banks and as such the contribution is an under-estimate.

(F) Transport and Communications

The estimates for Railways and Posts and Telegraphs are measured on the basis of wages and salaries paid to the employees engaged in these services as derived from their annual budgets and are based on current prices. The contribution of other transport is estimated by working out the annual net income of buses, trucks, taxis, rickshaws, tongas, *etc.* on the basis of the number of such vehicles multiplied by an assumed income of each type of vehicle. The assumed income is net of operating input expenses such as expenditure on depreciation, gasoline, *etc.* The estimate is based on an assumed income worked out for the year 1950-51. So, for this sector, the year 1950-51 is base year.

Country transport, *i.e.*, animal-drawn vehicles could not be covered by this estimate due to paucity of relevant data. The income accruing from the inland water transport also could not be covered for the same reason. So, the estimate may be considered as understated.

(G) Services including Construction

The contribution of services has been computed on the basis of the number of persons engaged in various professions and occupations and their assumed income. The income data on which the estimate is based relates to the year 1950-51. Later estimates have been prepared by extrapolation of the number of persons engaged in various services by the rate of population growth. The assumed income rate for the year 1950-51 has been kept constant. So, the base year for this sector is 1950-51.

The estimate of number of persons engaged in the various services is very rough and sometimes overlapping in the sense that the number of doctors, lawyers, *etc.* covered by this sector might have included such professionals engaged in government service and as such already covered by the government sector.

Construction is also included in services. The estimates of income for construction has also been computed on the basis of number of persons engaged in this industry and the estimated annual income determined on the basis of income tax data and wage surveys.

(H) Rental Income

The estimate of income under this sector is based on the number of

houses both in urban and rural areas reported in the 1951 Census and the estimated annual rent per house in rural and urban areas for the year 1950-51. No special consideration for depreciation, *etc.*, has been made. As the data used relate to the year 1951, the estimates derived represent the income for the year 1950-51. The income estimates for subsequent years have been computed on the basis of the rate of growth of population.

(I) Wholesale and Retail Trade

The estimate of income for this sector has been computed on the basis of number of persons engaged in distributive trades by categories as reported in the 1951 Census and the annual assumed income of such people. The contribution for subsequent years has been estimated by adjustment of the base year figure in the light of increase or decrease in the income accruing to agriculture, mining and manufacturing as it is thought that the income of distributive trade is mainly influenced by these sectors.

(J) Indirect Taxes on Exports

The estimate of income under this sector has been based on the average export tax yield of the four-year base period. The estimates for the subsequent years have been made by adjusting the base period export taxes on the basis of the changes in the physical volume of exports.

(K) Factor Income Payments

Factor income payments means the net earnings of the country from its invisible transactions with the rest of the world. This represents the difference between profits, interest and dividends paid out of Pakistan and received into Pakistan. In order to obtain figures at constant prices, the net earnings of the base period has been deflated by the Import Price Index, on the assumption that the value changes of factor income payments have been similar to that of the import prices.

(L) Effects of Terms of Trade

The effects of terms of trade are computed by deflating the value of exports in current year by the Import Price Index for the base period and the same value of exports is deflated by the ratio of the Export Price Index of the current year to that of the base period, the difference between the two deflated values reflect the real effect of terms of trade.

NATIONAL INCOME OF PAKISTAN AT CONSTANT PRICES (BY INDUSTRIAL ORIGIN) 1949-50 to 1960-61

(Prices Average of 1949-50 to 1952-53)

(Crores of Rs.)

SECTORS	1949-50	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61
Agriculture	1,046.2	1,082.4	1,049.5	1,094.5	1,166.3	1,163.0	1,122.5	1,212.2	1,195.4	1,173.5	1,232.4	1,255.1
Major Agricultural Crops ..	632.6	658.4	612.2	637.9	695.1	678.2	637.7	727.4	710.6	688.7	747.6	770.3
Minor Agricultural Crops ..	115.4	115.4	116.0	127.4	142.5	142.5	142.5	142.5	142.5	142.5	142.5	142.5
Livestocks	227.3	232.3	236.9	241.5	241.5	241.5	241.5	241.5	241.5	241.5	241.5	241.5
Fisheries	67.6	73.0	81.1	84.4	83.9	97.5	97.5	97.5	97.5	97.5	97.5	97.5
Forestry	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Mining	2.3	2.6	3.0	3.4	3.6	3.9	4.3	4.6	5.1	5.2	5.7	6.6
Manufacturing	119.1	127.9	137.6	150.5	175.9	193.5	220.8	237.4	247.3	258.5	278.3	301.0
Large-scale	25.0	31.3	39.1	50.0	73.4	89.0	114.2	128.6	136.2	145.1	162.6	182.9
Small-scale (b)	94.1	96.6	98.5	100.5	102.5	104.5	106.6	108.8	111.1	113.4	115.7	118.1
Government	80.8	85.8	104.8	103.2	105.2	104.9	113.0	116.4	131.8	146.3	136.2	134.2
Banking and Insurance	4.3	5.1	5.8	6.8	6.9	7.1	7.5	7.9	10.0	10.4	12.9	14.5
Transport and Communications (b) ..	44.2	50.4	51.3	51.9	53.4	53.8	56.5	58.4	61.1	64.6	66.5	68.8
Services(1) (b)	147.3	154.3	157.3	160.5	163.7	166.8	170.2	173.6	177.1	180.6	184.1	187.8
Rental Income(b)	100.5	103.6	104.4	106.5	108.6	110.8	113.0	115.2	117.5	120.0	122.2	124.7
Wholesale and Retail Trade(b) ..	160.7	166.9	163.8	171.8	185.2	187.2	185.4	200.1	199.2	197.8	211.9	214.9
Indirect Taxes on Exports	18.2	35.6	28.6	29.2	28.8	23.5	28.7	22.0	17.8	18.2	19.1	16.5
Factor Income Payments	-1.0	-9	-8	-1.4	..	-9	-2.6	-1.2	-0.8	-1.0	-1.8	-1.8
Effects of Terms of Trade	1.2	18.7	9.9	-30.1	-52.6	-27.8	-63.7	-61.2	-52.8	-70.1	-98.2	-61.7
Total National Income ..	1,723.8	1,832.4	1,815.2	1,846.8	1,945.0	1,985.0	1,955.6	2,085.4	2,108.7	2,104.0	2,169.3	2,260.6
Population (in '000') (a)	74,250	75,040	77,861	80,089	81,571	83,074	84,510	85,964	87,584	89,261	90,997	92,793
Per Capita Income	232	244	233	231	238	239	231	243	241	236	238	244

(Source: Central Statistical Office)

NOTE :—Estimates are provisional and based on year April-to-March. Income from Minor Crops, Livestock, Fisheries, Forestry has been repeated from previous years.

(1) Includes construction.

(a) Population figures are those worked out by the Planning Commission on the basis of preliminary results of 1961 Population Census.

(b) The estimates have been revised on the basis of new rate of population growth.