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CAPITAL FORMATION IN INDIAN AGRICULTURE

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Estimates of net domestic product from agriculture for the years 1960-61 to 1967-68 are presented in the publication entitled "Estimates of National Product (Revised Series)," Central Statistical Organisation (March, 1969). This publication does not contain estimates of capital formation in agriculture. An attempt is made in this paper to compile the estimates of capital formation in Indian agriculture at current and at 1960-61 prices for the period 1960-61 to 1967-68 and to study its movement during the period.

The scope of the agricultural sector includes growing of field crops, fruits, nuts, seeds, vegetables, flowers, tea, coffee and rubber plantations; raising of live-stock, poultry; production of milk, wool, eggs and agricultural services including operating irrigation services and rental of farm machinery. Capital formation in the agricultural sector includes expenditure on land reclamation and land clearance, irrigation and flood control projects and dams, plantation, orchard and vineyard development, farm buildings, agricultural machinery and equipment such as harvesters, threshers, ploughs, harrows, tractors, etc. However, capital expenditure on construction of warehouses, cold storage and roads is not included.

Estimates of capital formation can be prepared by one of the following three methods, provided necessary data are available. First method involves the estimation of production of capital goods used in the agricultural sector. The second method pertains to the estimation of capital expenditure in the private and public sectors. The third method is based on the sources of finance in the form of savings and loans used for capital formation. As data are not available to compile the three alternative estimates of capital formation, only one estimate has been worked out in this paper. The product approach has been followed in the case of agricultural tools, implements, farm machinery, and increase in livestock.¹ The production of farm equipment¹ has been obtained from Volume VIII of the census part of the Annual Survey of Industries for the period 1960 to 1964 which deals with major group 36, manufacture of machinery except electrical machinery. Estimates for the years 1965 and 1966 have been compiled on the basis of provisional results of Annual Survey of Industries in respect of the gross output of the industry group 36, in the absence of detailed reports. The estimate for the year 1966 has been projected to the year 1967 on the basis of past trend. Estimates of net imports of agricultural equipment² have been compiled from the Monthly Statistics of Foreign Trade of India issued by the Department of Commercial Intelligence and Statistics. Consolidated data on production of farm equipment in the industries not covered by the census part of the Annual Survey of Industries

1. Figures for end use of agricultural equipment are not available. Necessary adjustment to account for parts of equipment used in current repairs and maintenance has not been made.

2. See Footnote 1.

are not available. However, estimates of such equipment³ have been obtained as a residual for 1961-62 and assumed to remain constant for other years in the absence of any suitable indicator. Estimates of value of increase in livestock have been obtained from Central Statistical Organisation.

The expenditure approach has been adopted in the case of farm households, co-operative societies, non-government Indian public and private limited companies and branches of foreign companies engaged in agricultural activities, Central and State Governments, local bodies, and non-departmental undertakings. Capital formation in the case of farm households for the year 1961-62 has been based on the data collected in the "All-India Rural Debt and Investment Survey, 1961-62," and published in the *Reserve Bank of India Bulletin*, June, 1965 and on National Sample Survey data for urban households collected in the seventeenth round. The base year estimates of capital formation in (i) wells and (ii) other irrigation resources have been projected to other years with the help of an indicator relating to the area irrigated by wells and other sources available in the season and crop reports of the State Government for the period 1960-61 to 1964-65 and on the basis of data obtained from the Directorate of Economics and Statistics, Department of Agriculture, Ministry of Food, Agriculture, Community Development and Co-operation, for the year 1965-66. These projected estimates at 1961-62 prices have been adjusted to current prices with the help of a construction cost index. Estimates of capital formation in (i) reclamation of land, (ii) bunding and other land improvements, (iii) new plantations and additions to existing orchards and plantations and (iv) farm houses, grain *golas* and cattle sheds, have been projected to other years on the basis of a combined indicator relating to the net product from the agricultural sector and loans and advances to cultivators by government for capital formation with weights 70 and 30 per cent respectively. This indicator has also been used for (i) wells and (ii) other irrigation resources for the purpose of projecting the estimates of the year 1965-66 to 1966-67 and 1967-68 in the absence of any appropriate indicator.

Estimates of capital formation in respect of co-operative farming societies have been obtained from the publication "Statistical Statements Relating to the Co-operative Movement in India" brought out by the Reserve Bank of India for the years 1959-60 to 1966-67. Estimates for the year 1967-68 have been obtained on the basis of past trend. The estimates in the case of non-government Indian public and private limited companies and branches of foreign companies have been compiled from the data published in the *Reserve Bank of India Bulletins* of March, 1964, July, 1966, July, 1967, December, 1967 and January, 1968.

Estimates of net capital formation in agriculture in the private sector at current prices have been obtained by adding the estimates of net fixed capital formation by farm households, co-operative farming societies and corporate sector in farm buildings and other works, agricultural equipment and increase in livestock and other farm inventories. Estimates at 1960-61 prices have been obtained by deflating the estimates at current prices with a construction cost index for farm

3. Estimates have been obtained on the basis of All-India Rural Debt and Investment Survey and National Sample Survey data for 1961-62. The estimates of capital equipment produced in small scale industries have been assumed to be constant as firm figures of production in this sector are not available so far.

buildings and other works and the Economic Adviser's index number of wholesale prices of machinery for agricultural equipment. Estimates in the case of increase in livestock at 1960-61 prices have been obtained from the Central Statistical Organisation.

Estimates of capital formation in agriculture in the public sector have been compiled from the budget documents/annual accounts of the Central and State Governments, local bodies, and non-departmental undertakings. Budget documents of the Central and State Governments contain information in respect of capital expenditure on terracing of lands, soil conservation, contour bunding, irrigation wells, reclamation of saline and alkaline lands and irrigation works. The capital expenditure in agriculture undertaken by local bodies has been obtained from the grants by State Governments to *Zila Parishads* and other *Panchayati Raj* institutions for the purpose of minor irrigation works and other construction works in the agricultural sector. In the case of multi-purpose river valley project schemes, the capital expenditure on electricity schemes has not been taken into account. For non-departmental undertakings, estimates of expenditure on irrigation works incurred by the Damodar Valley Corporation have been obtained from its annual accounts. The estimates of capital formation in agriculture in respect of three undertakings in the public corporate sector, viz., (i) Maharashtra State Farming Corporation, (ii) Punjab Poultry Corporation and (iii) Plantation Corporation of Kerala have been obtained from their balance sheets. The estimates at 1960-61 prices have been obtained by deflating the estimates at current prices with the help of a price index based on the Economic Adviser's index number of wholesale prices of (i) bricks and tiles, (ii) logs and timber, (iii) iron and steel, (iv) cement and (v) wages of rural skilled labour in agriculture with weights 30, 15, 10, 10, and 25 respectively.

The Central and State Governments give subsidies, loans and advances to cultivators for the purpose of incurring expenditure on construction and improvement of wells, soil conservation schemes, terracing of lands, lift irrigation schemes, land reclamation and purchase of cattle, etc. However, the major sources of finance in the case of farm households for the purpose of capital formation are savings. The borrowings are generally from government, co-operatives, other financial institutions, private moneylenders and others. In the absence of detailed annual data in respect of the various sources of finance for capital formation in agriculture, it has not been possible to compile the estimates of capital formation based on financial resources.

The estimates of net capital formation in agriculture at current prices and at 1960-61 prices and their percentage distribution are presented in Tables I and II respectively. The comparison of movement of net capital formation and net domestic product in agriculture is given in Table III.

It is observed that the capital formation in agriculture at current prices increased from Rs. 408 crores in 1960-61 to Rs. 710 crores in 1967-68 whereas at 1960-61 prices, it increased to Rs. 507 crores only. The contribution of the private sector was 68 per cent in 1960-61, it declined to 54 per cent in 1965-66 and thereafter increased to 65 per cent in 1967-68. The index number of net capital formation with base 1960-61 was 174 in 1967-68 at current prices and 124 at 1960-61

TABLE I—NET CAPITAL FORMATION IN AGRICULTURE (AT CURRENT PRICES)

(Rs. in crores)

Item	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Private sector ..	278.3 (68.3)	215.0 (59.8)	220.3 (58.7)	238.5 (59.4)	295.2 (59.2)	290.5 (54.0)	323.6 (58.0)	462.0 (65.1)
1.1 Farm households	266.8 (65.5)	207.9 (57.8)	212.8 (56.7)	236.2 (58.8)	285.7 (57.3)	286.7 (53.3)	315.5 (56.5)	453.4 (63.9)
(i) Net fixed capital formation ..	182.5 (44.8)	190.0 (52.8)	192.7 (51.3)	214.3 (53.4)	256.7 (51.5)	269.9 (50.2)	327.5 (58.7)	362.7 (51.1)
(ii) Increase in live-stock	84.3 (20.7)	17.9 (5.0)	20.1 (5.4)	21.9 (5.4)	29.0 (5.8)	16.8 (3.1)	12.0 (2.2)	90.7 (12.8)
1.2 Co-operative ..	0.7 (0.2)	0.4 (0.1)	0.6 (0.2)	1.0 (0.3)	0.7 (0.1)	1.2 (0.2)	1.6 (0.3)	2.1 (0.3)
1.3 Corporate ..	10.8 (2.6)	6.7 (1.9)	6.9 (1.8)	1.3 (0.3)	8.8 (1.8)	2.6 (0.5)	6.5 (1.2)	6.5 (0.9)
2. Public sector	129.3 (31.7)	144.4 (40.2)	155.0 (41.3)	163.1 (40.6)	203.5 (40.8)	247.0 (46.0)	234.1 (42.0)	247.5 (34.9)
3. Total	407.6 (100.0)	359.4 (100.0)	375.3 (100.0)	401.6 (100.0)	498.7 (100.0)	537.5 (100.0)	557.7 (100.0)	709.5 (100.0)

N.B. : Figures in brackets indicate percentage to the total.

TABLE II—NET CAPITAL FORMATION IN AGRICULTURE (AT 1960-61 PRICES)

(Rs. in crores)

Item	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Private sector ..	278.3 (68.3)	206.8 (60.0)	206.2 (58.8)	217.0 (59.5)	251.2 (58.9)	233.3 (54.0)	245.0 (57.8)	328.8 (64.8)
1.1 Farm households	266.8 (65.6)	200.0 (58.0)	199.2 (56.8)	214.9 (58.9)	243.9 (56.9)	230.2 (53.3)	238.8 (56.4)	322.4 (63.6)
(i) Net fixed capital formation ..	182.5 (44.8)	182.7 (53.0)	180.9 (51.6)	195.4 (53.6)	222.4 (52.1)	218.6 (50.6)	247.4 (58.4)	257.6 (50.8)
(ii) Increase in live-stock	84.3 (20.7)	17.3 (5.0)	18.3 (5.2)	19.5 (5.3)	20.6 (4.8)	11.6 (2.7)	—8.6 (—2.0)	64.8 (12.8)
1.2 Co-operative ..	0.7 (0.2)	0.4 (0.1)	0.6 (0.2)	0.9 (0.3)	0.6 (0.2)	1.0 (0.2)	1.2 (0.3)	1.5 (0.3)
1.3 Corporate ..	10.8 (2.6)	6.4 (1.9)	6.4 (1.8)	1.2 (0.3)	7.6 (1.8)	2.1 (0.5)	5.0 (1.1)	4.9 (0.9)
2. Public sector	129.3 (31.7)	137.8 (40.0)	144.3 (41.2)	147.9 (40.5)	175.6 (41.1)	198.4 (46.0)	178.6 (42.2)	178.3 (35.2)
3. Total	407.6 (100.0)	344.6 (100.0)	350.5 (100.0)	364.9 (100.0)	426.8 (100.0)	431.7 (100.0)	423.6 (100.0)	507.1 (100.0)

N.B.: Figures in brackets indicate percentage to the total.

TABLE III—COMPARISON OF MOVEMENT OF NET CAPITAL FORMATION AND NET DOMESTIC PRODUCT IN AGRICULTURE

Item	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>1. At current prices</i>								
1.1 Net capital formation (Rs. crores)	407.6	359.4	375.3	401.6	498.7	537.5	557.7	709.5
1.2 Net domestic product (Rs. crores)	6,571	6,769	6,066	8,018	9,845	9,435	11,301	14,480
1.3 Net capital formation as a proportion of net domestic product (per cent)	6.2	5.3	5.4	5.0	5.1	5.7	4.9	4.9
<i>2. At 1960-61 prices</i>								
2.1 Net capital formation (Rs. crores)	407.6	344.6	350.5	364.9	426.8	431.7	423.6	507.1
2.2 Net domestic product (Rs. crores)	6,571	6,627	6,441	6,610	7,226	6,108	6,095	7,247
2.3 Net capital formation as a proportion of net domestic product (per cent)	6.2	5.2	5.4	5.5	5.9	7.1	7.0	7.0
<i>3. Index number with 1961 as base</i>								
<i>3.1 At current prices</i>								
3.1.1 net capital formation	100.0	88.2	92.1	98.5	122.4	131.9	136.8	174.1
3.1.2 net domestic product	100.0	103.0	105.1	122.0	149.8	243.6	172.0	220.4
<i>3.2 At 1960-61 prices</i>								
3.2.1 net capital formation	100.0	84.5	86.0	89.5	104.7	105.9	103.9	124.4
3.2.2 net domestic product	100.0	100.9	98.0	100.6	110.0	93.0	92.8	110.3

prices. During this period the index number of net domestic product from agriculture increased to 220 at current prices and 110 at 1960-61 prices. The net capital formation as a proportion of net domestic product was 6.2 per cent in 1960-61, 5.7 per cent in 1965-66 and 4.9 per cent in 1967-68 at current prices. However at 1960-61 prices, the net capital formation increased from 5.2 per cent in 1961-62 to 7.1 per cent in 1965-66 and thereafter it declined to 7.0 per cent in 1967-68.