

# Rural Resources Generation and Mobilisation

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*This paper examines savings generation and deployment in the rural sector. It discusses the level and determinants of investment within the rural sector as well as the flow of resources to and from the sector in the form of financial liabilities and assets.*

*Rural aggregates have been broken up, as far as possible, to provide estimates for agricultural and nonagricultural households. Separate study of savings behaviour of agricultural households is important, both for understanding the dynamics of Indian agriculture and for situating the Indian experience in the debate on agriculture's resource contribution in the initial stages of industrialisation. Separate treatment of agriculture is required because, despite agriculture's dominance, rural aggregates sometimes give a picture very different from that relating only to agricultural households.*

*The main theme that emerges is that there is no clear evidence of an increase in rural or agricultural savings rates, but there is considerable evidence of a change in the pattern of savings, i.e., in asset preference. There have been shifts in preference between financial and physical assets, and also between the components of both groups of assets.*

THE Indian savings rate grew impressively over the three decades between the early 1950s and the end of the 1970s. Gross savings as a proportion of gross domestic production (GDP) increased from less than 10 per cent in the early 1950s to about 22 per cent towards the close of the 1970s.

All sectors of the economy did not, however, participate equally in contributing to the increased savings rate. For social accounting purposes, the Indian economy is conventionally divided into three sectors: the public sector, the private corporate sector, and a residual—'household' sector. The significant stepping up of the Indian savings rate was made possible principally by the remarkable savings performance of the household sector. This sector's savings as a proportion of GDP increased from less than 7 per cent in the early 1950s to more than 16 per cent in the late 1970s. In contrast, over the same period, public sector savings as a proportion of GDP increased from 2 per cent to about 5 per cent and private corporate savings barely increased from 1 to 1½ per cent.

Savings may be used to acquire either physical assets or financial assets. Even in the late 1970s, physical assets were the dominant form of household savings. However, the rapid increase in household savings over the past three decades took place mainly in financial savings. The share of physical assets formation in the household savings was more than four-fifths in the early 1950s. The share declined to about three-fifths by the end of the 1970s.

When 'households' save in financial assets, they in effect lend resources to the other sectors and hence finance investment in those sectors. Financial savings of households were about 1 per cent of GDP in the early 1950s, between 3 and 4

per cent in the 1960s, and rose sharply in the 1970s reaching about 7 per cent towards the end of that decade. Thus, in the late 1970s, households were transferring about 7 per cent of GDP for financing investment in the public and private corporate sectors.

The Sixth Five Year Plan (covering the period 1980-1985) visualises an increase in aggregate savings rate to nearly a quarter of domestic product by 1984-85. The Plan aims at stepping up the savings rate in the public and private corporate sectors, particularly in the former. If the

projections are realised, the share of public sector savings in aggregate savings will increase from 17 per cent in 1979-80 to 25 per cent in 1984-85, the share of the private corporate sector will increase from 7 to 8 per cent, whereas the share of the household sector will fall from about three quarters to about two-thirds. However, given the present weight of the household sector in total savings, reaching a savings rate of 25 per cent would require, even according to the Plan, a stepping up of the savings rate in the household sector. Close to half the in-

TABLE 1: RURAL SAVINGS

| Gross Aggregate Savings (Rs crore) |                             |                      | Savings Rate*           |                             |                      |
|------------------------------------|-----------------------------|----------------------|-------------------------|-----------------------------|----------------------|
| Agricultural Households            | Non-Agricultural Households | All Rural Households | Agricultural Households | Non-Agricultural Households | All Rural Households |
| 1                                  | 2                           | 3                    | 4                       | 5                           | 6                    |
| 871                                | 125                         | 996                  | 0.13                    | 0.06                        | 0.11                 |
| 946                                | 146                         | 1092                 | 0.13                    | 0.06                        | 0.12                 |
| 1010                               | 159                         | 1169                 | 0.12                    | 0.06                        | 0.11                 |
| 1074                               | 153                         | 1227                 | 0.11                    | 0.05                        | 0.09                 |
| 1133                               | 178                         | 1311                 | 0.12                    | 0.06                        | 0.10                 |
| 1173                               | 157                         | 1330                 | 0.10                    | 0.04                        | 0.09                 |
| 1253                               | 193                         | 1446                 | 0.09                    | 0.04                        | 0.08                 |
| 1290                               | 221                         | 1511                 | 0.09                    | 0.05                        | 0.08                 |
| 1365                               | 246                         | 1611                 | 0.09                    | 0.05                        | 0.08                 |
| 1542                               | 250                         | 1792                 | 0.09                    | 0.05                        | 0.08                 |
| 1634                               | 265                         | 1899                 | 0.09                    | 0.05                        | 0.08                 |
| 1782                               | 314                         | 2096                 | 0.09                    | 0.05                        | 0.08                 |
| 2115                               | 324                         | 2439                 | 0.08                    | 0.04                        | 0.07                 |
| 1923                               | 320                         | 2243                 | 0.07                    | 0.04                        | 0.06                 |
| 2259                               | 394                         | 2653                 | 0.09                    | 0.05                        | 0.08                 |
| 2335                               | 569                         | 2904                 | 0.08                    | 0.06                        | 0.08                 |
| 2630                               | 544                         | 3174                 | 0.08                    | 0.05                        | 0.08                 |
| 3078                               | 572                         | 3650                 | 0.10                    | 0.06                        | 0.09                 |

**Note:** The savings rate has been estimated by dividing the aggregate savings by relevant income. Rural income was assumed to be 1.325 times agricultural income as indicated by CSO, *National Accounts Statistics*, 1981 Appendix Table A.1.1.

**Sources:** (1) Appendices 1 and 2; and Appendix Table VIII.  
(2) CSO, *National Accounts Statistics*, various issues.

**TABLE 2: RURAL PER CAPITA INCOME TRENDS**

| Years   | Index of Per Capita Income (current prices) (1961-62 = 100) | Agricultural Labourers' Consumer Price Index (1960-61 = 100) |
|---------|---|--|
| 1960-61 | —   | 100  |
| 1961-62 | 100   | —  |
| 1962-63 | 100   |  |
| 1963-64 | 114   |  |
| 1964-65 | 137   |  |
| 1965-66 | 130   | 169  |
| 1966-67 | 152   |  |
| 1967-68 | 185   |  |
| 1968-69 | 177   |  |
| 1969-70 | 190   |  |
| 1970-71 | 201   | 206  |
| 1971-72 | 204   | 215  |
| 1972-73 | 220   |  |
| 1973-74 | 291   | 313  |
| 1974-75 | 315   | 413  |
| 1975-76 | 285   | 345  |
| 1976-77 | 300   | 324  |
| 1977-78 | 338   | 340  |

*sources:* (1) CSO *National Accounts Statistics*, various issues.  
(2) CSO *Statistical Abstracts of India*,

crease in household savings, it is hoped, will take the form of financial assets. Thus, according to the Plan targets, the household sector would transfer about 8 per cent of GDP to other sectors by 1984-85.

Household savings, therefore, have been and, in the foreseeable future, will continue to be of critical importance to physical assets formation in the Indian economy. Not only do the 'households' undertake almost half the aggregate physical investment, but through transferring savings they make possible greater investment in the public and private corporate sectors. The behaviour of 'household' savings will to a large extent determine whether the Sixth Plan investment targets are achieved or not. This is likely to be particularly so if the ambitious public sector savings targets are not achieved.

The determinants of both the households savings rate and the savings pattern need, therefore, to be carefully understood. In doing so, the first step is to recognise the heterogeneity of the so-called household sector. This sector, it will be recalled, is essentially a residual sector. The sector comprises all economic agents and organisations other than those accounted for by the public sector and the private corporate sector. As such, besides pure households, all unincorporated business enterprises are included in the household sector.

One segment of the household sector with some degree of homogeneity is the rural sector. Rural areas are those with a limited population size and relatively low population density, and where more than three-quarters of the workforce are engaged in agriculture.<sup>1</sup>

The importance of the rural sector to the Indian economy is, of course, well known. About 75 per cent of the Indian population is located in the rural areas. Almost two-thirds of national income is generated in the rural areas. Above all, agricultural production, dominant not just in terms of income generated and numbers employed but critical also in setting limits to the growth of other sectors, is almost entirely a rural activity.

In this paper, we examine savings generation and deployment in the rural sector. We examine the level and determinants of investment within the rural sector, as well as the flow of resources to and from the sector in the form of financial liabilities and assets.

As far as possible, rural aggregates have been broken up to provide estimates for agricultural and non-agricultural households. Separate study of savings behaviour of agricultural households is important, both for understanding the dynamics of Indian agriculture and for situating the Indian experience in the debate on agriculture's resource contribution in the initial stages of industrialisation. Separate treatment of agriculture is required because, despite

agriculture's dominance, rural aggregates sometimes give a picture very different from that relating only to agricultural households.

The main theme that emerges is that there is no clear evidence of an increase in rural or agricultural savings rates, but there is considerable evidence of a change in the pattern of savings, i.e., in asset preference. There have been shifts in preference between financial and physical assets, and also between the components of both groups of assets.

The paper is organised as follows:

The all-India aggregate rural savings and the savings rates over 1961-62 to 1978-79 are presented in section 1. All-India financial flows in the rural sector over the same period are described in section 2. The regional dimensions are explored through an inter-State comparison of rural savings and financial flows in section 3, the complete enumeration of physical and financial flows is attempted only for 1971-72; some important components of financial flows are, however, considered for earlier and later years. In section 4, the determinants of physical investment in agriculture are sketched. In the concluding section 5, the determinants of agricultural savings and the relationship between physical investment and net financial flows are enumerated. On that basis, the Sixth Plan targets of irrigation, household savings, and institutional credit, to agriculture are assessed.

**TABLE 3: RURAL FINANCIAL SAVINGS AND PHYSICAL INVESTMENT**

|         | Net Financial Savings (Rs crore) |            |          | Net Financial Savings Gross Physical Investment |            |          |
|---------|----------------------------------|------------|----------|---|------------|----------|
|         | A Sector                         | NAR Sector | R Sector | A Sector  | NAR Sector | R Sector |
| 1961-62 | -21.73                           | 45.34      | 23.61    | -0.02   | 0.57       | 0.02     |
| 62-63   | -1.73                            | 61.84      | 60.11    | -0.00   | 0.74       | 0.06     |
| 63-64   | 3.86                             | 68.90      | 72.76    | 0.00  | 0.77       | 0.07     |
| 64-65   | 5.90                             | 56.85      | 62.75    | 0.00  | 0.59       | 0.05     |
| 65-66   | -0.64                            | 75.27      | 74.63    | -0.00   | 0.74       | 0.06     |
| 66-67   | -30.82                           | 48.74      | 17.92    | -0.03   | 0.45       | 0.01     |
| 67-68   | -25.45                           | 77.15      | 51.70    | -0.02   | 0.67       | 0.04     |
| 68-69   | -67.00                           | 98.16      | 31.16    | -0.05   | 0.80       | 0.02     |
| 69-70   | -74.75                           | 113.78     | 39.03    | -0.05   | 0.86       | 0.02     |
| 70-71   | 13.07                            | 109.58     | 122.65   | 0.01  | 0.78       | 0.07     |
| 71-72   | 10.05                            | 116.16     | 126.21   | 0.01  | 0.80       | 0.07     |
| 72-73   | 57.55                            | 156.39     | 213.94   | 0.03  | 0.99       | 0.11     |
| 73-74   | 284.48                           | 155.39     | 439.87   | 0.16  | 0.92       | 0.22     |
| 74-75   | -19.75                           | 140.13     | 120.38   | -0.01   | 0.78       | 0.06     |
| 75-76   | 197.32                           | 201.61     | 398.93   | 0.10  | 1.05       | 0.18     |
| 76-77   | 145.16                           | 364.53     | 509.69   | 0.07  | 1.79       | 0.21     |
| 77-78   | 304.92                           | 327.45     | 632.37   | 0.13  | 1.51       | 0.25     |
| 78-79   | 609.99                           | 340.01     | 950.00   | 0.25  | 1.47       | 0.35     |

*Note:* (1) A Negative sign indicates net inflow of financial resources into the sector.  
(2) A: agricultural, NAR: non-agricultural rural, R: rural.

*Source:* Appendices 1 and 2.

TABLE 4: COMPOSITION OF FORMAL FINANCIAL SAVINGS

(Per Cent)

| Years        | Currency | Life Insurance | PF etc | Small Savings and Others | Co-op Shares and Deposits | Commercial Bank Deposits | Total |
|--------------|----------|----------------|--------|--------------------------|---------------------------|--------------------------|-------|
| RURAL        |          |                |        |                          |                           |                          |       |
| 1961-62      | 25       | 16             | 31     | 0                        | 18                        | 6                        | 100   |
| 1962-63      | 33       | 15             | 30     | 0                        | 14                        | 6                        | 100   |
| 1963-64      | 35       | 13             | 26     | 1                        | 16                        | 7                        | 100   |
| 1971-72      | 24       | 11             | 22     | 6                        | 12                        | 21                       | 100   |
| 1972-73      | 28       | 10             | 19     | 8                        | 14                        | 19                       | 100   |
| 1973-74      | 33       | 11             | 21     | 11                       | 9                         | 13                       | 100   |
| 1976-77      | 27       | 9              | 18     | 5                        | 12                        | 27                       | 100   |
| 1977-78      | 15       | 9              | 18     | 5                        | 11                        | 39                       | 100   |
| 1978-79      | 22       | 7              | 15     | 5                        | 12                        | 34                       | 100   |
| AGRICULTURAL |          |                |        |                          |                           |                          |       |
| 1961-62      | 23       | 16             | 24     | 1                        | 30                        | 6                        | 100   |
| 1962-63      | 32       | 16             | 23     | -1                       | 23                        | 6                        | 100   |
| 1963-64      | 33       | 13             | 20     | 1                        | 26                        | 7                        | 100   |
| 1971-72      | 27       | 10             | 15     | 7                        | 18                        | 23                       | 100   |
| 1972-73      | 30       | 9              | 13     | 8                        | 20                        | 21                       | 100   |
| 1973-74      | 32       | 9              | 13     | 10                       | 12                        | 23                       | 100   |
| 1976-77      | 29       | 8              | 12     | 5                        | 17                        | 30                       | 100   |
| 1977-78      | 15       | 8              | 12     | 6                        | 16                        | 40                       | 100   |
| 1978-79      | 23       | 7              | 10     | 5                        | 17                        | 35                       | 100   |

Source: Appendix 2.

Our estimates show that the savings rate of A households has been around 10 per cent and the savings rate of NAR households has been around 6 per cent. The difference between the two rates is overstated here on account of the estimation procedure.<sup>2</sup> It is, however, likely that the A rate will be seen as higher than the NAR rate even when the estimation bias is adjusted for.

## (3) Trends over time:

It appears that the savings rate of A households fell slightly in the mid-1960s and has remained steady since then. The savings rate of NAR households has remained almost unchanged. Thus, not only has the rural savings rate been lower than the all-India rate, it has also shown no tendency to increase during a period which saw impressive growth in the all-India rate.<sup>3</sup>

The fall in savings rate in the mid-1960s was probably due to the extremely low level of agricultural production during 1965-66 and 1966-67. The fall was specially sharp in the case of financial savings, and there was, in fact, a significant net inflow of financial resources into agricultural households via institutional credit agencies during the second half of the 1960s (we discuss this below in greater detail).

The failure of the savings rate to revive in the 1970s, despite the rapid growth of financial savings (as discussed below), was mainly due to the continued sluggishness of physical investment. Of course, our investment figures are based on the assumption of a constant growth rate that prevailed during the 1960s. It could, therefore, be objected that the sluggishness in the 1970s is built into our estimates. However, the limited available evidence from the *Livestock Censuses* of 1977 and earlier years also does not indicate any acceleration of investment in the 1970s. As we shall discuss in section 4, there seem reasons to believe that fixed investment in agriculture has indeed grown slowly.

Also, our physical investment estimates do not include working capital investment. Though physical *fixed* investment has grown slowly, investment in working capital has increased very rapidly, the growth has been particularly sharp in the addition to current material inputs, from about Rs 100-150 crore annually, in the second half of 1960s, to about Rs 200-300 crore annually in 1970s. However, despite the rapid growth, the increase in current material inputs continues to form a small part of total investment and less than 1 per cent of income. Its inclusion in our savings estimates will not, therefore, affect the observation that

#### 1 Aggregate Savings: All-India Time Series

We have estimated aggregate savings in the rural sector and also the rural savings rates for the period 1961-62 to 1978-79. In this section, we present these estimates and highlight some features of interest.

The aggregate savings of the agricultural (A) sector, the non-agricultural rural (NAR) sector and the entire rural (R) sector are shown in Table 1. All savings reported here are gross savings, i.e., no attempt has been made to account for depreciation. The physical and financial components of rural savings were independently estimated. The estimation details are given in Appendices 1 and 2. In our discussion in the main text, we shall refer only to those aspects of the estimation procedure which are of relevance for interpreting the estimates. The physical investment figures for 1961-62 and 1971-72 were obtained from RBI's *Debt and Investment Surveys*. Physical investment expenditure is here taken to be the gross capital expenditure reported in the *Surveys* minus expenditure on purchase of land and land rights. It includes expenditure on purchase of livestock and durable household assets, but does not in-

clude accumulation of inventories. The physical investment estimates for years, other than 1961-62 and 1971-72, were obtained by assuming a constant growth rate. (For the comparability of the 1961-62 and 1971-72 estimates, see Appendix 1).

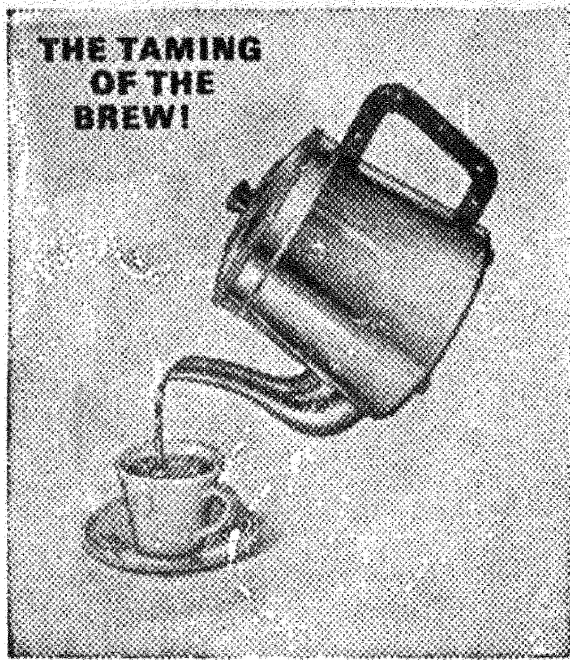
The corresponding savings rates are also shown in Table 1. These rates measure the proportion of savings to income generated in that sector. The income generated in agriculture was obtained from CSO's *National Accounts Statistics*. Rural income was assumed to be 1-325 times agricultural income as indicated by the CSO in an estimate made for 1970-71 (see *National Accounts Statistics*, 1981, Appendix Table A.1.1). The NAR income was derived from the difference between the rural and agricultural incomes.

From Table 1, the following features of the rural savings rates emerge:

## (1) Aggregate savings rate:

The rural savings rate has on an average been around 8 per cent. At this level, the rural rate has been significantly lower than the all-India rate.

## (2) Difference between A and NAR households:



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**1. ROASTING:**

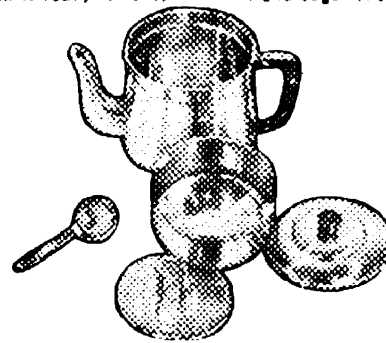
Under-roasting of the coffee beans gives the brew a 'raw taste' Over-roasting causes bitterness! Care should therefore be taken to roast the beans evenly to a golden brown colour

**2. GRINDING:**

Make sure the coffee powder is not ground too fine or too coarse. Finely ground powder tends to clog filter holes. If the powder is too coarse the brew will be weak and inconsistent

**3. BREWING:**

For Best Results Use a Coffee Board Filter: Place filter inside the jug. Put the coffee powder (one spoon per cup) in the filter and spread evenly Now place the plunger inside the filter, pressing down the powder lightly. Pour freshly-boiled water and close the lid. After 5 minutes, the decoction is ready for use. Add milk and sugar to taste.



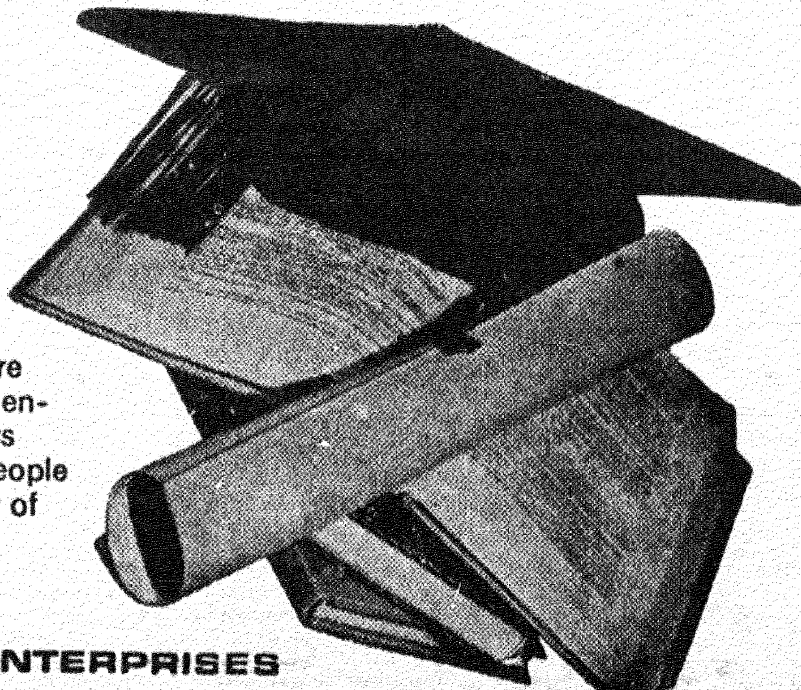
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TABLE 5: NET FINANCIAL FLOW TO INSTITUTIONAL CREDIT AGENCIES

(Rs crore)

| Years   | Commercial Banks |              | Co-operatives | Government |
|---------|------------------|--------------|---------------|------------|
|         | Rural            | Agricultural |               |            |
| 1961-62 | 3.82             | 2.87         | - 32.51       | - 45       |
| 1962-63 | 4.73             | 3.76         | - 32.51       | - 48       |
| 1963-64 | 6.82             | 4.89         | - 38.04       | - 57       |
| 1964-65 | 6.16             | 6.28         | - 19.27       | - 55       |
| 1965-66 | 8.76             | 8.36         | - 64.11       | - 61       |
| 1966-67 | 10.91            | 10.66        | - 59.27       | - 68       |
| 1967-68 | 12.89            | 13.73        | - 70.01       | - 74       |
| 1968-69 | 15.50            | 17.59        | - 148.69      | - 80       |
| 1969-70 | 18.84            | 14.46        | - 171.22      | - 87       |
| 1970-71 | 21.85            | 36.54        | - 127.59      | - 93       |
| 1971-72 | 25.52            | 36.06        | - 153.68      | - 99       |
| 1972-73 | 29.39            | 42.40        | - 131.18      | - 177      |
| 1973-74 | 6.24             | 53.46        | - 71.65       | - 91       |
| 1974-75 | - 16.94          | - 24.58      | - 89.27       | - 78       |
| 1975-76 | 17.94            | 12.66        | - 51.27       | - 82       |
| 1976-77 | 35.57            | 85.60        | - 266.48      | - 86       |
| 1977-78 | 104.23           | 9.86         | - 126.08      | - 98       |
| 1978-79 | 4.52             | 26.78        | - 65.24       | - 119      |

Source: Appendix 2.

TABLE 6: RURAL AND 'HOUSEHOLD' FINANCIAL SAVINGS

| Year    | Gross R  | Gross A  | Gross A | Net R  | Net A  | Net A  |
|---------|----------|----------|---------|--------|--------|--------|
|         | Gross HH | Gross HH | Gross R | Net HH | Net HH | Net R  |
|         | (1)      | (2)      | (3)     | (4)    | (5)    | (6)    |
| 1961-62 | 0.20     | 0.13     | 0.63    | 0.05   | 0.04   | - 0.92 |
| 62-63   | 0.23     | 0.14     | 0.62    | 0.12   | - 0.03 | - 0.03 |
| 63-64   | 0.20     | 0.13     | 0.64    | 0.10   | 0.01   | 0.05   |
| 64-65   | 0.21     | 0.14     | 0.66    | 0.09   | 0.01   | - 0.09 |
| 65-66   | 0.23     | 0.16     | 0.67    | 0.09   | 0.00   | - 0.01 |
| 66-67   | 0.19     | 0.13     | 0.71    | 0.02   | - 0.04 | 1.72   |
| 67-68   | 0.24     | 0.17     | 0.68    | 0.06   | - 0.03 | - 0.49 |
| 68-69   | 0.27     | 0.18     | 0.67    | 0.04   | - 0.08 | - 2.15 |
| 69-70   | 0.26     | 0.18     | 0.67    | 0.05   | - 0.09 | - 1.92 |
| 70-71   | 0.24     | 0.17     | 0.69    | 0.09   | 0.01   | 0.11   |
| 71-72   | 0.23     | 0.16     | 0.71    | 0.08   | 0.01   | 0.08   |
| 72-73   | 0.25     | 0.10     | 0.73    | 0.09   | 0.02   | 0.27   |
| 73-74   | 0.21     | 0.17     | 0.71    | 0.13   | 0.10   | 0.65   |
| 74-75   | 0.18     | 0.13     | 0.71    | 0.05   | - 0.01 | - 0.16 |
| 75-76   | 0.20     | 0.15     | 0.73    | 0.11   | 0.05   | 0.49   |
| 76-77   | 0.20     | 0.15     | 0.73    | 0.10   | 0.03   | 0.28   |
| 77-78   | 0.22     | 0.16     | 0.76    | 0.12   | 0.06   | 0.48   |
| 78-79   | 0.23     | 0.17     | 0.75    | 0.14   | 0.09   | 0.64   |

Sources: (1) Appendix 2.

(2) RBI Report on Currency and Finance, various issues, see also Appendix Table VII.

the savings rate has not grown. (For the details of working capital computation, see Appendix 3.) If contrary to our assumption of equal growth, NAR incomes have grown at a slower rate than A incomes, the NAR savings rate increase is understated here. However the difference is not likely to be significant. For details on urban-rural income shares over time, see Mohan 1982, Appendix 1.

The savings rate is influenced by several factors. Here it may be noted that the lack of growth in savings rate is consistent with a rural per capita real income that has remained stationary (see Table 2). Other variables that influence the savings rate are considered in section 3 and 4.

## II Financial Savings: All-India, Time Series

In this section, we discuss: (1) the magnitude of rural net financial savings; (2) the changes in composition of rural financial assets and liabilities; (3) the relationship between rural net financial savings and rural physical investment; (4) the share of rural financial savings in total 'household' savings and (5) the relationship between 'formal' and 'informal' financial assets in the rural sector.

### (1) Net financial savings:

As indicated above, there have been important changes in rural financial sav-

ings, and these have significant implications for rural resource mobilisation. The estimates of rural net financial savings are presented in Table 3.

In estimating the net financial savings, the annual acquisition of financial assets and liabilities was separately computed. Only formal (or external) financial assets and liabilities were considered. These are assets and liabilities that involve transactions with institutional agencies. They are distinguished from informal (or internal) borrowing and lending, which cancel out within the sector and hence do not count in the estimation of the sector's net savings. The financial assets thus considered were: currency, life insurance premia, provident fund contributions, small savings, commercial bank deposits and co-operative shares and deposits. The sources of financial liabilities considered were commercial banks, co-operatives and the government. Net financial savings in any year were estimated as the difference between the assets acquired and the liabilities incurred. Positive net financial savings indicate a net lending of resources by the sector and negative net financial savings indicate a net inflow of resources into the sector.

Table 3 shows that there was a net inflow of resources into agricultural (A) households in the 1960s, particularly in the second half of that decade.<sup>4</sup> However, the direction of resource flow changed quite dramatically in the 1970s. The resource outflow from A households in the 1970s fluctuated from year to year, but showed an overall increasing trend.

In contrast, NAR households have been net financial savers right through. The magnitude of NAR net financial saving in the 1960s was greater than the deficit of A households, so that there was a net savings outflow from the rural sector or even when there was a savings inflow into the agricultural sector.

NAR financial savings have grown steadily right through. In the 1970s, however, it is the A households (which were deficit in the 1960s) that increased their financial savings at the more rapid rate.

Before seeing the financial flows in relation to other relevant magnitudes, it would be useful to take a closer look at the components of these flows.

### (2) Financial flows—a disaggregated picture:

We examine here the instruments and agencies through which the rural financial flows have been mediated. On the assets side, the most significant change has taken place in commercial bank deposits (see Table 4). The share of commercial bank deposits in rural financial

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TABLE 7: RURAL INFORMAL SAVINGS

|         | Informal Financial Savings as a Ratio of Formal Gross Financial Savings | Expenditure on Purchase of Land as a Ratio of Gross Formal Financial Savings |
|---------|---|--|
| 1961-62 | 0.64  | 0.95   |
| 1971-72 | 0.26  | 0.40   |

Sources: (1) Appendix 2.  
(2) RBI *All India Debt and Investment Survey*, 1971-72.

TABLE 8: AGRICULTURAL SAVINGS RATE  
—STATEWISE 1971-72

| States         | Savings Rate (%) | Per Capita Income (Rs) |
|----------------|------------------|------------------------|
| Andhra Pradesh | 4(2)             | 521(7)                 |
| Gujarat        | 11(8)            | 581(11)                |
| Haryana        | 10(6)            | 867(12)                |
| Karnataka      | 12(9)            | 529(8)                 |
| Kerala         | 15(12)           | 531(9)                 |
| Madhya Pradesh | 10(6)            | 405(4)                 |
| Maharashtra    | 2(1)             | 372(1)                 |
| Orissa         | 5(3)             | 377(2)                 |
| Punjab         | 12(9)            | 1061(13)               |
| Rajasthan      | 15(12)           | 431(5)                 |
| Tamil Nadu     | 5(3)             | 470(6)                 |
| Uttar Pradesh  | 12(9)            | 380(3)                 |
| West Bengal    | 8(5)             | 535(10)                |

Notes: (1) Savings rate is aggregate savings as a percentage of income in agriculture and allied activities.  
(2) Rural population was multiplied by the proportion of workers engaged in agriculture to obtain the agricultural population.  
(3) Figures in brackets are ranks in the ascending order.

Sources: (1) Appendix Table VI; and Appendix Table IX.  
(2) RBI *Bulletin*, April 1978.  
(3) *India Bulletin of Food Statistics*.

assets was 6 per cent in the early 1960s, and it rose to over 30 per cent in the late 1970s. The shares of all other assets have fallen. However, it must be noted that even the instruments with falling shares show significantly rising *absolute* magnitudes.

A point of difference between A and NAR households may be noted. Though both groups show the same basic trends in the composition of assets as outlined above, the share of provident fund contributions in A household savings has always been lower, and the share of co-

operative shares and deposits has always been higher, than the corresponding shares for NAR households.

On the credit side, it will be seen from Table 5 that the large net inflow into the agricultural sector in the second half of the 1960s came mainly from the co-operatives. In the 1970s, the net inflow from the co-operatives has not grown but in fact has probably fallen. At the same time, though commercial bank credit to agriculture has grown rapidly, the equally rapid increase in commercial bank deposits has meant that commercial banks have throughout been a net recipient of resources from the agricultural and rural sectors. The net flow to commercial banks has probably increased in the 1970s. There has also been no significant increase in government credit to agriculture.

Thus, while the main institutional credit agencies have not been increasing the annual net financial inflow into agriculture to any significant extent, savings in the form of currency, life insurance premia, and provident fund contributions, have been growing, leading to an increasing net outflow of financial resource from the rural sector.

To gain some perspective on these rural 'formal' financial flows, we examine them below in relation to rural physical investment, aggregate 'household' sector financial savings, and 'informal' financial savings.

#### (3) Net financial savings and physical investment

##### (a) Agricultural households:

Referring again to Table 3, it will be noted that till the early 1970s net financial savings of agricultural households were less than 5 per cent of investment in physical assets formation. In the early 1960s and early 1970s, in particular, net financial savings were negligible. In the second half of the 1960s, the net savings inflow into agriculture touched 5 per cent of physical investment in agriculture and was, therefore, of some significance in financing private agricultural investment. From the point of view of the non-agricultural sector, however, the savings transfer was negligible right through to the early 1970s; and even in years of high savings inflow into agriculture, the net inflow was 1 per cent or less of physical investment in the non-agricultural sector.<sup>5</sup>

Since the early 1970s, however, the net financial outflow from agriculture has grown significantly, and in 1978-79 formed 25 per cent of physical investment in that sector (and roughly 2 per cent of the sector's income). In 1978-79, in fact, agriculture's net financial savings had grown appreciably even in relation to

non-agricultural investment, constituting about 3 per cent of such investment.

##### (b) Non-agricultural (NAR) households:

Relative to A households, NAR households have always had a greater preference for financial savings. This preference (as in A households) has increased over time. In the early 1960s, NAR households' financial savings formed between half and three-quarters of their physical investment. But by the late 1970s, financial investment was one and a half times physical investment (and roughly 4 per cent of NAR income).

The net financial savings of NAR households have not been negligible even in relation to non-rural investment. Since an exact measure of non-rural investment is not available/<sup>1</sup> we use non-agricultural investment as a proxy. In the 1970s, net financial savings of NAR households have been between 1.5 and 2 per cent of non-agricultural investment.

#### (4) Rural and 'household' financial savings

Given the large increase in rural financial savings, it is of interest to enquire how rural financial savings trends compare with trends in financial savings of the entire household sector. We look into this question here.

Table 6 presents the relevant figures. We are here still discussing only 'formal' financial savings. It will be noted that gross rural financial savings (i.e., the total acquisition of financial assets) as a proportion of gross 'household' financial savings has changed very little over time. The proportion has moved within the narrow range of one-fifth and one-fourth. However, the lack of change in the aggregate conceals disparate trends in the components. Rural currency acquisition, of course, has been assumed to be a constant one-third of household currency acquisition. The share of rural households in life insurance premia declined in the 1970s according to indicators reported in the *LIC Annual Reports* (see Appendix 2). The share in provident fund contributions has also fallen over time. Balancing these, the share of rural households in commercial bank deposits has increased significantly.

It will be noted from Table 6 column (3) that the share of agricultural households in rural financial savings has increased over time, and hence though the rural share in all household savings has remained steady, the agricultural share has slightly increased.

The share of rural households in net household savings (gross savings net or credit taken) fell in the second half of the 1960s as credit inflow into agriculture in-

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TABLE 9: ANNUAL GROWTH RATES OF AGRICULTURAL PRODUCTION

| States           | 1953-54/<br>1963-64 | 1963-64/<br>1977-78 | 1960-61/<br>1970-71 | 1970-71/<br>1977-78 |
|------------------|---------------------|---------------------|---------------------|---------------------|
| Andhra Pradesh   | 3.16                | 1.54                | 1.95                | 2.32                |
| Assam            | 0.94                | 1.92                | 1.77                | 1.59                |
| Bihar            | 2.59                | 1.66                | 1.38                | 2.11                |
| Gujarat          | 5.02                | 2.83                | 4.29                | 2.37                |
| Karnataka        | 3.94                | 2.77                | 3.53                | 2.14                |
| Kerala           | 2.42                | 2.22                | 3.33                | 0.22                |
| Madhya Pradesh   | 2.49                | 0.94                | 1.15                | 0.22                |
| Maharashtra      | 2.68                | 2.23                | 0.99                | 6.42                |
| Orissa           | 3.45                | 1.37                | 3.26                | 1.53                |
| Punjab & Haryana | 3.97                | 6.21                | 5.75                | 5.01                |
| Rajasthan        | 3.23                | 3.72                | 3.05                | 2.82                |
| Tamil Nadu       | 4.04                | 2.29                | 2.31                | 1.93                |
| Uttar Pradesh    | 1.45                | 3.53                | 2.70                | 2.85                |
| West Bengal      | 1.49                | 2.58                | 3.12                | 1.89                |

Note: \* Derived from triennial averages of terminal year index numbers.

Source: Jose 1982 Table 5, p 14.

TABLE 10: ANNUAL GROWTH RATES OF GROSS CAPITAL EXPENDITURE UNDERTAKEN BY CULTIVATORS: 1961-62 TO 1971-72 (per cent)

| States             | Total | Farm Business | Non-Farm Business |
|--------------------|-------|---------------|-------------------|
| Andhra Pradesh     | -2.4  | -3.4          | 20.5              |
| Assam              | 6.0   | 0.1           | 23.0              |
| Bihar              | 5.1   | 2.6           | 24.5              |
| Gujarat            | 9.4   | 8.8           | 12.6              |
| Jammu and Kashmir  | 5.8   | 6.0           | 14.9              |
| Karnataka          | 6.0   | 4.9           | 25.0              |
| Kerala             | 4.5   | 4.0           | 7.0               |
| Madhya Pradesh     | 9.1   | 8.4           | 26.3              |
| Maharashtra        | 6.0   | 6.6           | 6.0               |
| Orissa             | 3.3   | 1.6           | 21.0              |
| Punjab and Haryana | 11.5  | 12.4          | 23.7              |
| Rajasthan          | 5.6   | 3.8           | 3.2               |
| Tamil Nadu         | 1.8   | 1.3           | 3.4               |
| Uttar Pradesh      | 5.7   | 4.4           | 0.1               |
| West Bengal        | 10.3  | 10.5          | 12.5              |

Note: Compound growth rate implicit in the two end point observation.

Source: RBI All India Debt and Investment Survey.

creased; the share returned to the old level in the early 1970s and even slightly exceeded that level by the end of the 1970s. Thus, in the late 1970s, about 15 per cent of net household savings came from rural households (see Table 6, column (4)). The increased share of rural households in the 1970s reflected principally the increased financial savings of agricultural households which increased their share in rural as well as all 'households' net savings.

(5) *Formal and informal financial savings*  
Considerable investment activity takes

place within the rural sector which does not show up as investment of the sector as a whole because it is balanced by an internal disinvestment. Thus, moneylending within the rural sector creates simultaneously an equal financial asset and liability, creating no net asset for the sector. Similarly, land purchases within the sector involve investment by one party and an equal disinvestment by another.

We compare here the trends in 'formal' financial saving and informal investment activity. We estimate informal financial savings by aggregating the debt owed by rural households to non-institutional agencies as reported in RBI's *Debt and Investment Surveys*. It is assumed that these non-institutional agencies are located within the rural sector and hence corresponding to the debt there are financial assets held in the rural sector. This procedure had to be adopted because, typically, informal lending is understated. For the details of estimation, see Appendix 2.

In Table 7, informal financial saving is shown as a proportion of gross formal financial saving. It may be seen that the proportion has declined during the last two decades.

It also appears from Table 7 that gross formal financial saving has risen faster than expenditure on purchase of land.

### III Aggregate Savings and Financial Flows—Statewise

#### (1) *Aggregate-savings:*

The statewide aggregate savings rates of agricultural households in 1971-72 are shown in Table 8. Only agricultural households have been considered because statewide data on rural incomes were not readily available.<sup>7</sup> The savings rates vary between a low of 2 per cent (in

Maharashtra) and a high of 15 per cent (in Kerala and Rajasthan).

(a) *Per capita income:* In order to understand the variation in the savings rates, we compared them with per capita incomes of agricultural households. When the ranks of the two variables are compared, we find that Maharashtra and Orissa with low per capita incomes have low savings rates, Karnataka with a relatively high per capita income has a high savings rate and Madhya Pradesh is in the middle of the spectrum with regard to both the variables.

(b) *Production acceleration:* But clearly, per capita income does not explain the variation in the other nine States. The ranks of the two variables in these States differ by three or more. We, therefore, considered the role of acceleration in production. During an accelerating phase, the savings rate is likely to be high for two reasons: (1) consumption standards change at a much slower rate than income; and (2) if the production acceleration reflects attractive investment opportunities, then there is an obvious incentive to save. In a decelerating situation, these factors would work in reverse.

Six States show a lower savings rate than warranted by their per capita income (i.e., the rank of the savings rate is considerably lower than the rank of the per capita income). Of these, Andhra Pradesh, Tamil Nadu and Gujarat experienced a large deceleration in agricultural production in the second half of the 1960s (see Table 9). Thus, in these States, decelerating production from the mid 1960s did, apparently, result in a low savings rate in 1971-72.

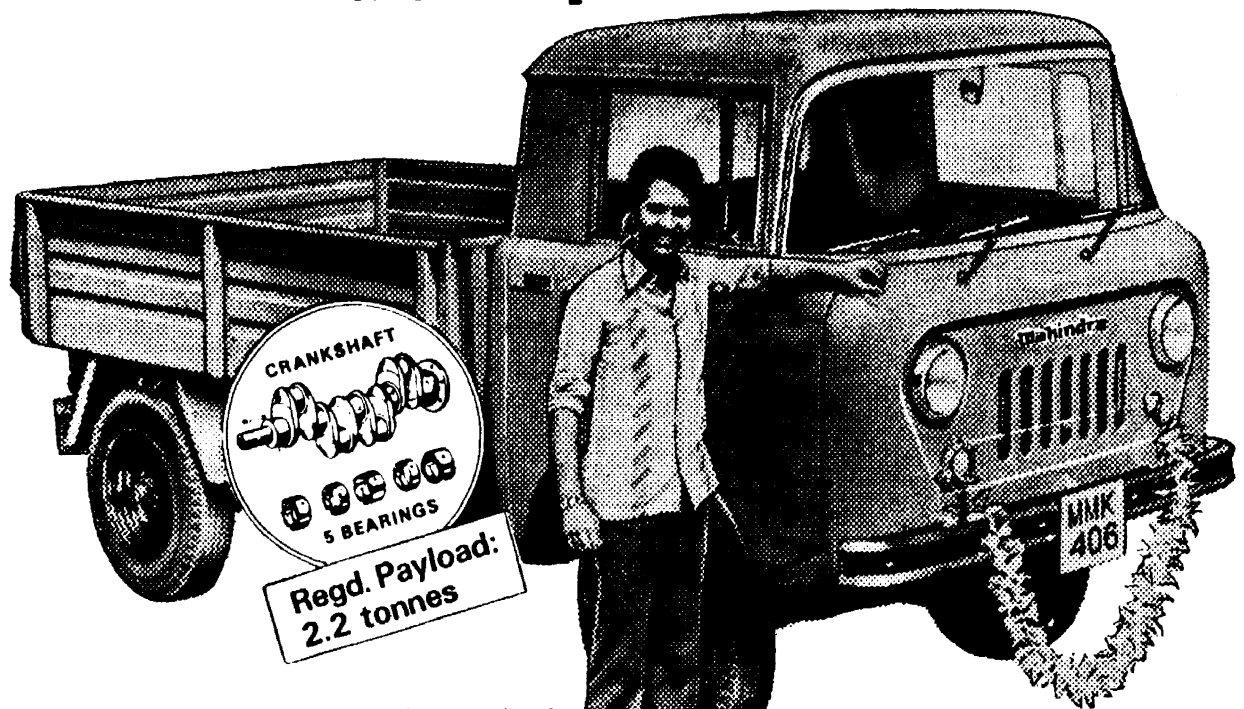
Conversely, Kerala, Rajasthan and Uttar Pradesh, States with savings rates in 1971-72 higher than warranted by their per capita incomes, experienced a sharp rise in production growth in the second half of the 1960s (Table 9).

It, therefore, appears that production acceleration (or deceleration) has a significant influence on the savings rate.

(c) *Limits to saving rate?:* There are three States for which the level of the saving rate is explained neither by the level of production nor by the change in the rate of production growth. These states are Punjab, Haryana and West Bengal. Agricultural households in these States had very high per capita incomes (Punjab households had the highest; Haryana, the second highest; and West Bengal, the fourth highest). But the savings rates in these States were not appreciably higher than in the other States. It is possible, of course, that the savings rates here are understated. That, however, is unlikely to be the whole story.

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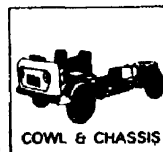
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TABLE 11: NET FINANCIAL SAVINGS—STATEWISE, 1971-72

| States         | Net Financial Savings<br>(Rs crore) |       |        | Net Financial Savings +<br>Gross Physical Investment |      |       |
|----------------|-------------------------------------|-------|--------|--|------|-------|
|                | A                                   | NAR   | R      | A  | NAR  | A     |
| Andhra Pradesh | - 0.35                              | 2.00  | - 1.65 | -0.01  | 0.28 | 0.02  |
| Bihar          | 32.63                               | 4.92  | 37.55  | 0.26   | 0.85 | 0.29  |
| Gujarat        | -18.91                              | 10.45 | - 8.46 | -0.16  | 0.75 | -0.06 |
| Haryana        | - 7.07                              | 1.52  | - 5.55 | -0.11  | 0.18 | -0.08 |
| Karnataka      | -19.79                              | 0.21  | -19.58 | -0.14  | 0.03 | -0.14 |
| Kerala         | 35.25                               | 2.98  | 38.23  | 0.65   | 1.24 | 0.68  |
| Madhya Pradesh | -12.42                              | 5.96  | - 6.46 | -0.09  | 0.99 | -0.05 |
| Maharashtra    | -92.94                              | 18.37 | -74.57 | -0.81  | 1.67 | -0.59 |
| Orissa         | - 3.01                              | 0.78  | - 2.23 | -0.08  | 0.22 | -0.06 |
| Punjab         | 2.57                                | 13.98 | 16.55  | 0.03   | 0.72 | 0.14  |
| Rajasthan      | 1.85                                | 3.87  | 5.72   | 0.02   | 1.02 | 0.05  |
| Tamil Nadu     | -24.26                              | 6.41  | -17.85 | -0.32  | 0.38 | -0.19 |
| Uttar Pradesh  | - 4.81                              | 19.58 | 14.77  | -0.02  | 0.72 | 0.04  |
| West Bengal    | 33.44                               | 26.40 | 59.84  | 0.42   | 1.68 | 0.62  |

Sources: (1) RBI *All India Debt and Investment Survey*, 1971-72.  
(2) Appendix 2.

It seems likely that there are limits to savings in forms considered here by us. The bulk of agricultural savings takes the form of physical investment in farm production. This investment is governed by the state of agricultural technology (as we elaborate in the next section). That there are limits to the extent of investment in farm activities is reflected partly in the fact that non-farm investment grew during the 1960s at a much faster rate than farm investment in almost all States (see Table 10).

Also, till the early 1970s, investment in formal financial institutions was limited by their poor spread in rural areas and, of course, by the limited degree of agricultural commercialisation.

#### (2) Financial flows:

We consider first the financial flows in some detail for 1971-72 and then consider certain component flows for which infor-

mation over time is available to get an idea of the trends,

(a)/vW *financial flows*, 1971-72: Table 11 shows the net financial flows during 1971-72 in most major States in India.<sup>8</sup> The picture is one of considerable inter-regional variation. At one extreme, there was a net saving, and hence net outflow of resources from the rural sector, of Rs 60 crore in West Bengal. At the other extreme, there was a net resource inflow of Rs 75 crore in Maharashtra,

The variations, however, are not without a pattern. Some features of interest may be noted. First, though the A sector in several States was a net recipient of resources, the NAR sector uniformly had positive net financial savings.

Secondly, the large net outflows from agriculture, both in absolute terms as well as in relation to physical investment, were from West Bengal, Bihar and Kerala. Of these, Kerala has had a long history of

commercialisation and development of financial institutions. This very probably explains the very high level of per capita gross investment in financial assets in Kerala (see Table 12).

West Bengal, Bihar and possibly other north-eastern States (though we do not have complete data for these States) fall in another category, West Bengal household did have a high per capita gross investment in financial assets commensurate with their per capita income. However, in West Bengal and Bihar (and other north-eastern States), the net outflow of financial resources was due not so much to the high level of gross financial investment as to the poor inflow of credit from institutional agencies. Table 12 shows that the per capita credit to rural households was the least in West Bengal and Bihar. (The per hectare credit was also relatively very low in these States.) In the early 1970s, co-operatives were still by far the main conduit of credit into rural areas. The small inflow of credit into the north-eastern States was due not to the limited physical spread of co-operatives in these States. In some measure, it was probably due to the high level of overdue to the co-operatives which set limits to the injections of fresh credit. At the end of June 1971, overdues as a proportion of outstandings were 60 per cent in Bihar, 70 per cent in West Bengal and 80 per cent or more in some of the other north-eastern States. The proportions were not only much higher than the all-India average of 40 per cent, but were indeed the highest among all States.<sup>9</sup> However, it could be argued that the high level of overdues was due to the low credit per capita and per hectare, which made the credit sub-optimal and hence wasteful. In this case, the attitude of the

TABLE 12: PER CAPITA FORMAL FINANCIAL ASSETS AND LIABILITIES IN RURAL (R) AND AGRICULTURAL (A) HOUSEHOLDS (Rs)

| States         | Gross Assets |               | Gross Liabilities |           | Net Assets |         |
|----------------|--------------|---------------|-------------------|-----------|------------|---------|
|                | R            | A             | R                 | A         | R          | A       |
| Andhra Pradesh | 7.56         | 8.16(8) (7)   | 7.09              | 8.29(8)   | 0.50       | - 0.12  |
| Bihar          | 10.74        | 10.89(5) NA   | 3.33              | 3.66(13)  | 7.40       | 7.22    |
| Gujarat        | 23.26        | 19.29(3) (3)  | 27.67             | 31.02(2)  | - 4.41     | - 11.72 |
| Haryana        | 8.19         | 7.24(11) (2)  | 14.88             | 18.07(7)  | - 6.69     | - 10.82 |
| Karnataka      | 11.59        | 10.85(6) (6)  | 20.44             | 21.48(4)  | - 8.82     | - 10.62 |
| Kerala         | 35.49        | 53.65(1) (5)  | 14.13             | 21.34(5)  | 21.35      | 32.30   |
| Madhya Pradesh | 4.79         | 3.29(13) (10) | 6.64              | 7.29 (10) | - 1.85     | - 4.00  |
| Maharashtra    | 12.24        | 7.75(9) (13)  | 33.73             | 39.63(1)  | - 21.49    | - 31.88 |
| Orissa         | 2.97         | 2.83(14) (12) | 4.07              | 4.57(12)  | 1.11       | - 1.74  |
| Punjab         | 39.71        | 31.03(2) (1)  | 23.64             | 27.93(3)  | 16.08      | 3.10    |
| Rajasthan      | 8.35         | 7.11(12) (9)  | 5.66              | 6.11(11)  | 2.70       | 1.00    |
| Tamil Nadu     | 10.22        | 9.28(7) (8)   | 16.44             | 19.96(6)  | 6.22       | - 10.68 |
| Uttar Pradesh  | 9.35         | 7.51(10) (11) | 7.40              | 8.24(9)   | 1.94       | - 0.72  |
| West Bengal    | 20.90        | 15.38(4) (4)  | 2.74              | 3.15(14)  | 17.92      | 12.22   |

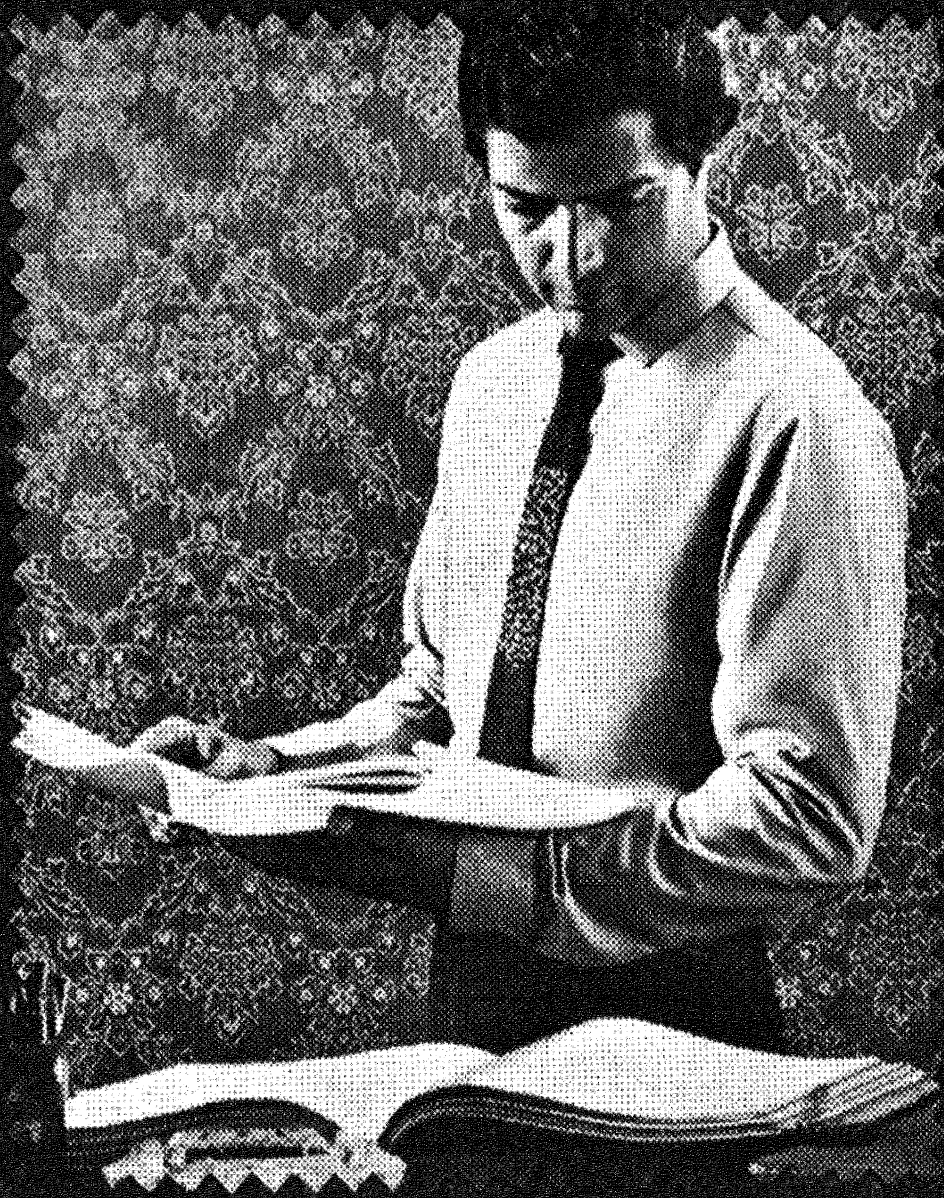
Note: Figures in first bracket are ranks of per capita assets or liabilities and in the second adjacent bracket are ranks of per capita income, both series being in the descending order.

Sources: (1) Appendix 2.

(2) India *Bulletin of Food Statistics*.



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TABLE 13: RURAL 'INFORMAL' SAVINGS—STATEWISE, 1971-72

| States         | State Per Capita Income** | Rank* Per Capita Gross Formal Assets Investment | 'Informal, Financial Savings as a Ratio of Gross Formal Financial Savings | Expenditure on Purchase of Land as a Proportion of Gross Formal Financial Savings | Total 'Informal' Savings as a Proportion of Gross Formal Financial Savings | Gini Co-efficient for Asset Holdings |
|----------------|---------------------------|---|---|---|--|--------------------------------------|
|                | (1)                       | (2)   | (3)   | (4)   | (5)  | (6)                                  |
| Andhra Pradesh | (7)                       | (12)  | 0.95  | 0.48  | 1.43   | 0.703                                |
| Bihar          | (NA)                      | (7)   | 0.06  | 0.10  | 0.16   | 0.672                                |
| Gujarat        | (3)                       | (3)   | 0.38  | 0.17  | 0.55   | 0.632                                |
| Haryana        | (2)                       | (11)  | 0.24  | 0.56  | 0.80   | 0.629                                |
| Karnataka      | (6)                       | (6)   | 0.38  | 0.39  | 0.77   | 0.655                                |
| Kerala         | (5)                       | (2)   | 0.03  | 0.12  | 0.15   | 0.661                                |
| Madhya Pradesh | (10)                      | (13)  | 0.50  | 1.72  | 2.12   | 0.589                                |
| Maharashtra    | (13)                      | (5)   | 0.22  | 0.48  | 0.70   | 0.649                                |
| Orissa         | (12)                      | (14)  | 0.67  | 0.45  | 1.12   | 0.598                                |
| Punjab         | (1)                       | (1)   | 0.06  | 0.55  | 0.61   | 0.683                                |
| Rajasthan      | (9)                       | (10)  | 0.74  | 0.20  | 0.94   | 0.559                                |
| Tamil Nadu     | (8)                       | (8)   | 0.62  | 0.73  | 1.35   | 0.711                                |
| Uttar Pradesh  | (11)                      | (9)   | 0.36  | 0.59  | 0.95   | 0.592                                |
| West Bengal    | (4)                       | (4)   | 0.07  | 0.21  | 0.28   | 0.660                                |

Note: \* The ranks are in the descending order.

\*\* Though the variables in this table all relate to the "rural" sector, per capita income relates to the "agricultural" sector, since per capita rural income could not be estimated.

Sum of columns (3) and (4).

Sources: (1) RBI All India Debt and Investment Survey, 1971-72.

(2) Appendix 2.

(3) RBI Bulletin, April 1978.

(4) RBI Staff occasional papers, June 1972.

government towards these States determined the extent of credit inflow, since the institutional credit agencies acted according to government policy.

Thirdly, the only State other than Kerala where there was a net outflow of financial resources, despite an adequate inflow of credit was Punjab. This reflected the relatively high level of gross financial investment accompanying the high per capita income.

Finally, the States where there was a large net inflow of financial resources into agriculture during 1971-72 were Maharashtra, Tamil Nadu, Karnataka and Gujarat. These States have had among the highest shares in institutional credit inflow (mainly the co-operatives in the early 1970s). Together, in the early 1970s, they accounted for about 60 per cent of credit inflow into all States, with just Maharashtra accounting for a quarter in some years. The institutional credit per hectare has been much above the all-India average in these States.

Though the overdues were relatively low in these States which received large institutional credit, they were by no means negligible. In Maharashtra, Tamil Nadu and Karnataka, the overdues were about 40 per cent of outstandings and

only in Gujarat were they 20 per cent.

The high level of credit flows in Gujarat and Karnataka were probably required to finance the rapid growth in the 1960s. But this was not the case for Tamil Nadu and Maharashtra which experienced relatively slow growth in the 1960s.

Thus, the net financial flows have been determined partly by the internal dynamics of agriculture and partly by government policy. In Kerala (where the level of commercialisation has been high) and in Punjab (where per capita incomes had reached a high level), the net financial flow was out of agriculture. Some high-growth States like Gujarat, Karnataka, and also Haryana, drew in financial resources of a net basis. The north-eastern States received very little credit, partly because of the high level of overdues, which have often been due to wilful default by cultivators (see RBI, 1974). However, certain important inter-regional variations cannot be explained along the above lines of reasoning. For example, the large disparity in per capita and per hectare outstanding credit as between the north-eastern States, on the one hand, and Maharashtra and Tamil Nadu, on the other, does not seem related to per capita income levels or growth or even the

level of overdues. Government policy, influenced by other criteria, appears to have had a significant influence in directing credit through institutional agencies.

(b) Rural 'informal' savings: 'Informal' financial savings or financial assets with counterpart financial liabilities within the rural sector have been estimated as in the all-India case (see also Appendix 2). Purchase of land has also been treated as 'informal' savings and this again, for most part, is balanced by disinvestment within the sector. Total informal savings have been expressed as a proportion of gross 'formal' financial savings. The relevant details are presented in Table 13.

There seems a fairly close relationship between per capita income and per capita gross formal financial savings (columns (1) and (2), Table 13). In addition, States with a high per capita income have a low ratio of informal to formal financial savings. The ratio in the high-income States is: Punjab: 0.61; Haryana: 0.80; Gujarat: 0.55; West Bengal: 0.28; Kerala: 0.15 and Karnataka: 0.77. The low-income States, in contrast, have a high informal to formal savings ratio: Rajasthan: 0.94; Madhya Pradesh: 2.12; Uttar Pradesh: 0.95 and Orissa: 1.12.

The exceptions to these generalisations may be noted. The per capita income for Bihar was not available, but was probably low. The low informal to formal savings ratio in Bihar was thus probably not commensurate with its per capita income. This was also so in Maharashtra. In the case of Maharashtra, we have at least a partial explanation. We noted above that Maharashtra received a very large volume of co-operative credit. To be eligible for such credit, cultivators have to subscribe to shares of agricultural credit societies and make some deposits also. Often credit is provided to help cultivators fulfil these obligations. Hence the high level of formal financial savings in Maharashtra probably exaggerates the genuine savings of cultivators.

Important exceptions also are Tamil Nadu and Andhra Pradesh. These States had relatively high per capita incomes but also had rather high informal to formal financial savings ratio. The explanation lies in the high degree of inequality in these States (see column (6), Table 13). It would appear that high inequality creates internal demand for credit which richer cultivators are able to satisfy. High inequality also probably is accompanied by more frequent land sales by poorer cultivators to richer cultivators. The experience of Tamil Nadu and Andhra Pradesh suggests that a high degree of inequality can stem the movement towards

**TABLE 14: NET CO-OPERATIVE BANK FLOWS: AGRICULTURAL HOUSEHOLDS**

(Rs crore)

| States                | 1961-62 | 71-72  | 77-78  |
|-----------------------|---------|--------|--------|
| <b>Andhra Pradesh</b> | -6.69   | -8.36  | -34.79 |
| <b>Bihar</b>          | -0.18   | -8.70  | -12.28 |
| <b>Gujarat</b>        | -4.34   | -14.23 | +25.00 |
| <b>Haryana</b>        | —       | -6.07  | -16.12 |
| <b>Karnataka</b>      | -3.02   | -13.30 | -10.95 |
| <b>Kerala</b>         | -0.68   | +3.66  | -0.37  |
| <b>Madhya Pradesh</b> | -2.94   | -11.80 | -10.00 |
| <b>Maharashtra</b>    | -6.26   | -81.71 | -2.41  |
| <b>Orissa</b>         | -0.56   | -4.36  | -11.59 |
| <b>Punjab</b>         | -0.63   | -4.02  | +3.99  |
| <b>Rajasthan</b>      | -0.28   | -3.51  | -11.92 |
| <b>Tamil Nadu</b>     | -7.31   | -22.06 | -26.62 |
| <b>Uttar Pradesh</b>  | -4.75   | -21.71 | -19.67 |
| <b>West Bengal</b>    | -0.85   | +0.58  | -21.80 |

*Note:* The figures are all three year averages around the year shown. The negative entries show a net inflow into agricultural households.

*Source:* Appendix 2.

**TABLE 15: NET COMMERCIAL BANK FLOWS: RURAL HOUSEHOLDS**

(Rs crore)

| States                | 1974-75 | 1977-78 |
|-----------------------|---------|---------|
| <b>Andhra Pradesh</b> | -8.43   | -28.84  |
| <b>Assam</b>          | 2.27    | -3.56   |
| <b>Bihar</b>          | 2.21    | -2.08   |
| <b>Gujarat</b>        | 15.69   | 15.11   |
| <b>Haryana</b>        | -0.34   | -8.71   |
| <b>Karnataka</b>      | -11.62  | 4.00    |
| <b>Kerala</b>         | -2.57   | 8.78    |
| <b>Madhya Pradesh</b> | -2.73   | -2.71   |
| <b>Maharashtra</b>    | -6.29   | -2.17   |
| <b>Orissa</b>         | 0.43    | -7.38   |
| <b>Punjab</b>         | 20.10   | 30.86   |
| <b>Rajasthan</b>      | -1.76   | -8.70   |
| <b>Tamil Nadu</b>     | -3.46   | -7.44   |
| <b>Uttar Pradesh</b>  | 11.48   | 11.44   |
| <b>West Bengal</b>    | 7.90    | -2.40   |

*Note:* The figures are all three year averages around the year shown. The negative entries show a net inflow into rural households.

*Source:* Appendix 2.

formal financial assets.

It is of interest here to note that not only do farmers in Andhra Pradesh and Tamil Nadu engage to a greater extent in internal lending and land purchases, they are also more prone to stocking of foodgrains. The data on market arrivals show that Punjab and Haryana farmers market most of their grain within three months of the harvest. Gujarat farmers market about half the grain within three months. But farmers in Tamil Nadu and Andhra market only about a quarter of the grain within three months of the

harvest.<sup>10</sup>

(c) *Trends in Statewise rural net financial flows:* Complete information of the type examined above for 1971-72 is difficult to place together for other years. We, therefore, look at some component flows. Data are available on co-operatives and commercial bank net flow. Since these constitute important components of rural financial flows, their trends should be pointers to the aggregate trends.

The data presented below are all based on three-year averages around the year indicated. The method of computation is discussed in Appendix 2. As above, the important features of the computation method are indicated where necessary for interpretation.

#### (i) *Co-operatives*

Table 14 shows the net flows to the co-operatives in the various states for three times points. A negative sign indicates net inflow of resources from co-operatives into agricultural households. Almost all signs in Table 14 are negative, indicating that co-operatives have been a net source of financial resources to agricultural households practically throughout the period in all States.

Two States show a net contribution of resources to co-operatives in 1977-78. These are Punjab and Gujarat. It will be noted that in 1971-72 both these States were net recipients of resources from the co-operatives. As was discussed above, however, when all financial flows are considered, there was a net outflow of resources from Punjab in 1971-72—even though there was a net inflow through the co-operatives. The fact that even on the co-operative account the flow turned outward by the late 1970s suggests that the outflow through other instruments too must have increased.

In the case of Gujarat, the aggregate inflow into A households in 1971-72 was of the order of Rs 19 crore (see Table 11). Almost all of this inflow was accounted for by the co-operatives (Table 14). The large net outflow (Rs 25 crore) on co-operative account in 1977-78 once again suggests that the net financial flows were out of Gujarat's agricultural households in the late 1970s and that the outflows were fairly substantial.

That Punjab and Gujarat should show large and increasing financial outflows is significant. These are States that have had high per capita incomes for a long period of time. They have also experienced periods of high growth. However, it will be noted that Gujarat experienced growth rates well over 4 per cent in the 1950s and 1960s, and that the growth rate fell to almost half (214 per cent) in the

1970s (see Table 9). Gujarat agriculture thus drew resources as long as it was on a high growth path and with the slackening of production turned into a net supplier of resources. The Punjab story is similar. With the slackening of growth, the net resource outflow has, as suggested above, increased.

Another State where a similar process has probably occurred is Karnataka. This is also a State which has had a relatively high per capita income, and which experienced high growth in the 1950s and 1960s followed by deceleration in the 1970s (see Table 9). The annual gross credit inflow from the co-operatives in 1977-78 remained at Rs 18 crore level of 1971-72. On the other hand deposits in co-operative societies increased, thereby reducing the net annual inflow.

Two states which showed the largest net inflow from the co-operatives in 1977-78 and which have also shown a secular increase in net inflow are Tamil Nadu and Andhra Pradesh. These increases cannot be explained by changes in growth conditions. The growth rate in Andhra Pradesh has fluctuated and did increase marginally from 2 per cent in the 1960s to 2.3 per cent in the 1970s. This order of increase does not seem to warrant the large increase in net credit inflow. In Tamil Nadu, the large increases in credit inflow have been accompanied by a secular deceleration in growth. It will be recalled that these are the States with the highest levels of inequality and that they showed in 1971-72 a relatively high level of 'informal' lending activity and expenditure on purchase of land. It seems possible that the agriculturists in these States have used institutional credit for 'informal' activities (as defined by us) rather than for production purposes.

The annual credit flows into Maharashtra declined over time as the overdues there mounted. The annual flow into the West Bengal and Bihar improved, though overdue levels declined only in West Bengal. However, differences persist in per hectare outstanding credit between Maharashtra and the north-eastern States as in the early 1970s.

#### (ii) *Commercial banks*

The broad observations made from the data on co-operatives are completely corroborated by the commercial bank figures (see Table 15). The large outflow of financial resources has been from high-income growth-decelerating areas, Gujarat and Punjab. Karnataka's transition from a net recipient of resources to a surplus state is also seen. Tamil Nadu and Andhra Pradesh are once again the major net resource recipients. The flow imbalances between the north-eastern

TABLE 16: CAPITAL EXPENDITURE OF CULTIVATORS

|                                 | Average Per Households (Rs) |              | Proportion of Households Reporting Expenditure (%) |         |
|---------------------------------|-----------------------------|--------------|--|---------|
|                                 | 1961-62                     | 1971-72      | 1961-62  | 1971-72 |
| Farm business                   | 139.5 (69.0)                | 205.6 (63.6) | 66.7   | 48.6    |
| Non-Farm business               | 6.5 (3.2)                   | 16.8 (5.2)   | 5.5  | 6.0     |
| Residential plots and buildings | 48.1 (23.8)                 | 77.1 (23.8)  | 49.8   | 34.0    |
| Durable household assets        | 8.1 (4.0)                   | 23.8 (7.4)   | 11.6   | 18.7    |
| Total                           | 202.2                       | 323.3        |  |         |

Note: Figures in brackets give percentages to totals.

Source: RBI All India Debt and Investment Survey. 1971-72

States and Maharashtra also appear to be undergoing correction.

of farm investment, presented below, seems to corroborate our interpretation.

#### IV Nature and Determinants of Farm Investment

As indicated in sections 1 and 3, rural physical investment grew only slowly in the 1960s. (The current price estimates for 1961-62 and 1971-72 imply an annual compound growth rate of about 6 per cent.) The slow growth of rural physical investment reflected essentially the sluggishness of the dominant farm investment. On the other hand, cultivators' investment in financial instruments grew rapidly during the 1970s. We suggested, above, the financial investment growth reflected continued limits to farm investment in the 1970s. This must, of course, remain a hypothesis till firm estimates on farm investment are available. However, evidence on the nature and determinants

#### (I) Composition of cultivators' physical fixed investment:

Table 16 shows the changes in the extent and composition of physical investment undertaken by cultivators. Several features shown up by the table are of importance,

##### (i) Farm Investment

Between 1961-62 and 1971-72 the proportion of cultivation reporting capital expenditure in farm business fell from two-thirds to half.<sup>11</sup> At the same time, the share of farm investment in total investment also fell. An examination showed that decline in the proportion of cultivators undertaking farm investment has occurred among all classes of cultivators. But the decline represents the operation of very different forces on small and large cultivators. The proportion of large cultivators reporting possession of assets

(i.e., physical stock) does not show a decline. However, in the case of small cultivators, the proportion reporting both stocks and flows shows a fall.

The evidence, therefore, suggests that disinvestment has been taking place among smaller cultivators. On the other hand, larger cultivators are buying higher valued equipment which requires less frequent replacement.

The quinquennial *Livestock Censuses* support the above interpretation based on RBI's *Debt and Investment Surveys*. The growth in the number of traditional implements and machinery (wooden plough, carts, sugarcane crushers worked by bullocks, etc) and livestock, which smaller cultivators principally invest in, has been extremely low: In some cases, the 1977 census shows an absolute fall over 1972. On the other hand, more modern implements (iron ploughs, tractors, pumpsets, sugarcane crushers worked by power, etc) have been growing rapidly. These are purchased mainly by larger cultivators and these, moreover, require less frequent replacement than traditional implements.

The disinvestment and the greater intervals between replacement reduce the annual capital expenditure. The higher value of modern machinery and equipment tends to raise the annual capital expenditure. The evidence, as it exists, suggests that the former two effects have had a significant impact on reducing the growth in the flow of capital expenditure.

Of course, thus far, we have explored only the proximate changes in the nature and location of capital expenditure. Ultimately, the growth in physical investment is determined by the dynamics of

TABLE 17: VALUE OF FIXED ASSETS PER HOUSEHOLDS IN NON AGRICULTURAL ENTERPRISES

|                  | Size of Agricultural Income (Rs) |           |         |           |           |             | Income Not Recorded | All Sizes |
|------------------|----------------------------------|-----------|---------|-----------|-----------|-------------|---------------------|-----------|
|                  | No Income                        | Below 600 | 600-999 | 1000-1999 | 2000-3999 | 400 & above |                     |           |
| Andhra Pradesh   | 514.59                           | 542.19    | 650.95  | 1030.65   | 1994.88   | 3424.40     | 610.00              | 679.37    |
| Assam            | 923.65                           | 819.81    | 870.41  | 1305.06   | 1323.86   | 2737.24     | 1154.00             | 1161.56   |
| Gujarat          | 1869.62                          | 923.37    | 916.27  | 1527.40   | 3812.69   | 15299.44    | —                   | 2414.25   |
| Haryana          | 1306.04                          | 1447.80   | 2196.46 | 2217.91   | 3078.94   | 2555.07     | 2700.00             | 1515.31   |
| Karnataka        | 942.65                           | 959.21    | 1317.78 | 1436.80   | 2302.06   | 5388.02     | —                   | 1292.66   |
| Kerala           | 1044.24                          | 456.20    | 750.34  | 1212.21   | 1490.81   | 7526.58     | —                   | 945.45    |
| Madhya Pradesh   | 620.62                           | 439.51    | 662.68  | 614.59    | 834.38    | 3113.91     | 700.00              | 736.97    |
| Maharashtra      | 992.59                           | 768.98    | 920.66  | 1529.22   | 2445.23   | 4469.64     | 1038.50             | 1313.01   |
| Punjab           | 1372.55                          | 2470.91   | 2267.02 | 3781.19   | 2986.45   | 6124.20     | —                   | 1864.24   |
| Tamil Nadu       | 648.03                           | 599.47    | 929.55  | 1677.45   | 1787.57   | 6062.97     | 189.50              | 852.90    |
| Uttar Pradesh    | 1126.47                          | 613.99    | 713.40  | 1236.82   | 2272.30   | 3581.62     | 427.21              | 1142.29   |
| West Bengal      | 554.23                           | 405.24    | 745.62  | 646.19    | 1461.76   | 2682.79     | 549.00              | 737.63    |
| Bihar            | 411.69                           | 446.45    | 518.27  | 718.83    | 1034.29   | 3501.00     | 547.38              | 714.43    |
| Himachal Pradesh | 1890.03                          | 1567.87   | 2022.84 | 1616.33   | 2273.16   | 4552.24     | —                   | 2077.10   |
| Jammu & Kashmir  | 1666.69                          | 1395.12   | 1482.83 | 1447.00   | 1511.59   | 3069.55     | 363.16              | 1733.50   |
| Orissa           | 337.37                           | 369.78    | 376.10  | 499.14    | 643.18    | 1625.43     | —                   | 426.79    |
| Rajasthan        | 1438.27                          | 834.01    | 1229.77 | 1564.74   | 1883.91   | 4473.23     | 524.00              | 1414.39   |

Source: Sarvekshana, April and July 1978.



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TABLE 18: DETERMINANTS OF FARM INVESTMENT

|                                |                     |          |         |          |   |
|--------------------------------|---------------------|----------|---------|----------|---|
| (1) All States                 | a) $(FF/A)' = 1.01$ | + 0.067  | IRP     | + 0.212  | W |
|                                | Standard error      | (0.118)  |         | (0.041)  |   |
|                                | T-Value             | (0.569)  |         | (5.184)* |   |
|                                | $R^2 =$             | 0.865    | $R^2 =$ | 0.854    |   |
| (2) Without Punjab and Haryana | b) $(FF/A)' = 0.86$ | + 0.535  | IRP     |          |   |
|                                | Standard error      | (0.131)  |         |          |   |
|                                | T-Value             | (4.090)* |         |          |   |
|                                | $R^2 =$             | 0.562    | $R^2 =$ | 0.434    |   |
| (3) All States                 | a) $(FN/A)' = 1.65$ | + 0.1846 | IRP     | - 0.959  | W |
|                                | Standard error      | (0.058)  |         | (0.051)  |   |
|                                | T-Value             | (3.169)* |         | (1.893)  |   |
|                                | $R^2 =$             | 0.478    | $R^2 =$ | 0.434    |   |
| (4) Without Punjab and Haryana | b) $(FN/A)' = 1.49$ | + 0.123  | IRP     |          |   |
|                                | Standard error      | (0.053)  |         |          |   |
|                                | T-Value             | (2.309)* |         |          |   |
|                                | $R^2 =$             | 0.308    | $R^2 =$ | 0.620    |   |
| (5) All States                 | a) $(FN/A)' = 1.32$ | + 0.148  | IRP     | + 0.028  | W |
|                                | Standard error      | (0.072)  |         | (0.025)  |   |
|                                | T-Value             | (2.053)  |         | (1.137)  |   |
|                                | $R^2 =$             | 0.647    | $R^2 =$ | 0.620    |   |
| (6) Without Punjab and Haryana | b) $(FN/A)' = 1.31$ | + 0.210  | IRP     |          |   |
|                                | Standard error      | (0.047)  |         |          |   |
|                                | T-Value             | (4.503)* |         |          |   |
|                                | $R^2 =$             | 0.609    | $R^2 =$ | 0.356    |   |
| (7) All States                 | a) $(FN/A)' = 1.54$ | + 0.187  | IRP     | 0.075    | W |
|                                | Standard error      | (0.069)  |         | (0.060)  |   |
|                                | T-Value             | (2.717)* |         | (1.247)  |   |
|                                | $R^2 =$             | 0.405    | $R^2 =$ | 0.356    |   |
| (8) Without Punjab and Haryana | b) $(FN/A)' = 1.41$ | + 0.139  | IRP     |          |   |
|                                | Standard error      | (0.058)  |         |          |   |
|                                | T-Value             | (2.383)* |         |          |   |
|                                | $R^2 =$             | 0.321    | $R^2 =$ |          |   |

Note: FF : fixed capital formation  
 FN : FF—expenditure on irrigation  
 A : total cropped area  
 IRP : change in proportion of area irrigated  
 W : change in proportion of area irrigated by wells.

$$(FF/A)' = (FF/A)_{1971-72} \div (FF/A)_{1961-62}$$

Note: \* Significant at 1 or 5 per cent level.

technological and institutional change in agriculture. We look into these factors later in the section. But, before doing that, it is useful to look at the other components of cultivators' capital expenditure.

#### (ii) Other investment

Table 16 shows that the proportion of cultivators reporting investment in non-farm business and durable household assets increased between 1961-62 and 1971-72. The share of these components of capital expenditure in total expenditure also rose. The rise was particularly sharp in the case of durable household goods.

The movement towards non-farm investment and investment in durable household goods represents a shift in the asset preference of larger cultivators, who undertake the bulk of these investments. It appears to signify limits to returns from farm investment. These limits apparently are encouraging investment in non-agricultural activities. That this shift is taking place, particularly among large farmers, may be seen from

Table 17. In most States, it is the largest agricultural income size group that has significant fixed investment per household in non-agricultural business. The distribution of non-farm activity is more evenly spread only in Punjab and Haryana. This is significant, in as much as the shift to non-farm investment seems most pronounced in States that have been most dynamic agriculturally.

The decline in proportion of households reporting investment in residential buildings and plots once again signifies a disinvestment process among small cultivators, as in the case of farm investment.<sup>1</sup>

#### (2) The determinants of farm investment:

Kuznets (1957, p xi) and Tostlebe (1957, p13, 14) have pointed out that American farm investment has in the past been determined primarily by technological changes and institutional conditions rather than merely by a favourable movement of relative price. Though such an examination has not been undertaken for India, the lack of response of aggregate production to a shift in terms of

trade in favour of agriculture indicate even in the Indian case investment cannot be stepped up only by manipulate prices (see Thamrajakshi, 1977, p 381-384).

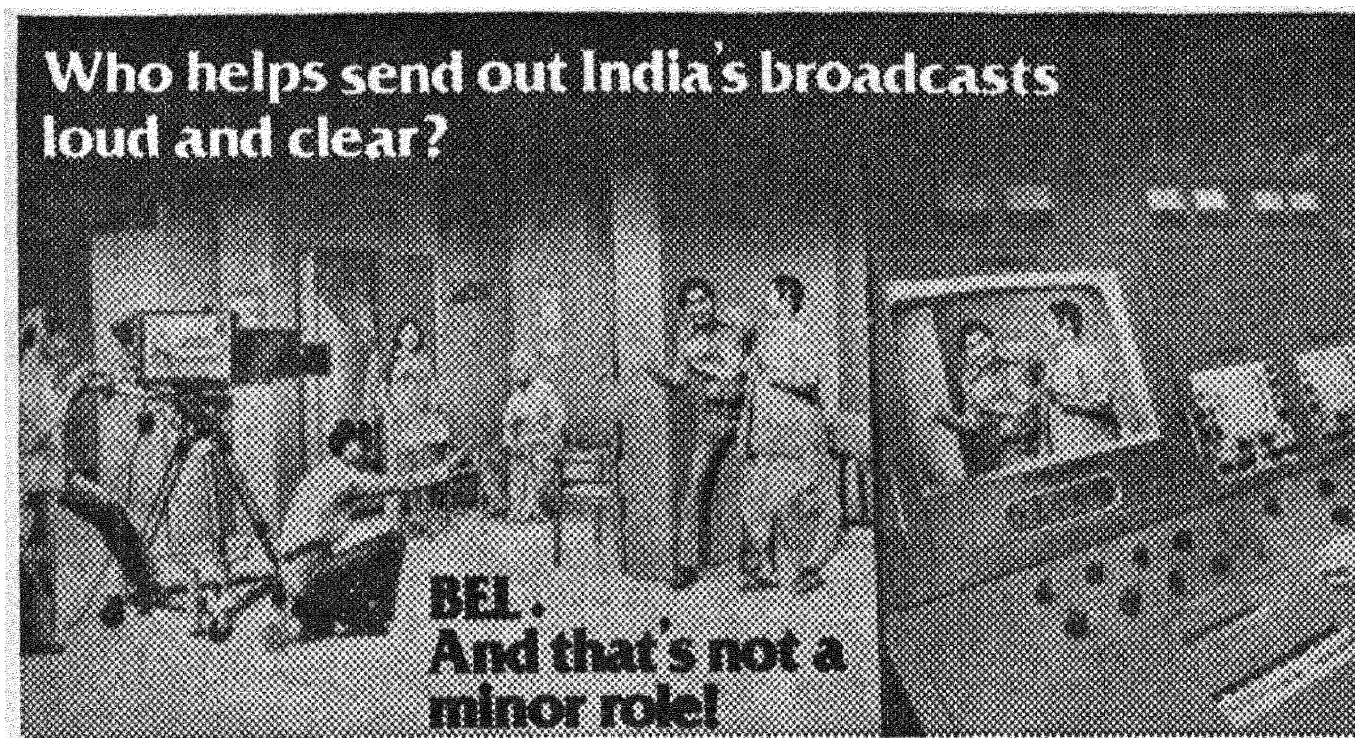
In the context of Indian agriculture production technology is determined principally by the availability and 'quality' of water. The supply of increased quantities of water through irrigation makes possible a shift in cropping pattern, usually to higher valued crops. The 'quality' of water, or degree of control that can be exercised over water use determines the efficient adoption of modern high yielding seed varieties: well as the efficient use of chemical fertilisers. As Raj has pointed out: "The percentage area of land that can be provided with assured supplies of water therefore, imposes a limit to the rate of growth that can be realised by technological change" (Raj, 1970, p 122).

Almost by definition, investment is likely to increase most in areas of rapid technological change. In the Indian case we have just argued that irrigation determines the technology. As the proportion of area irrigated increases, private investment is likely to increase for several reasons. Of course, irrigation itself would, if privately provided, demand investment expenditure from agriculture households. In addition, cropping pattern changes and technological changes in crop production are likely to demand investment in land preparation, agricultural implements and machinery.

Moreover, areas of rapid technological changes, i.e., areas with increasing irrigation, also experience rapid growth in income (see Raj, 1970, p 121). Thus we may expect relatively rapid growth of investment in areas with expanding irrigation facilities, as both the demand and supply conditions are favourable to growth in investment.

We tested the above propositions with the *Debt and Investment Survey* data. The *Survey* provides data on fixed capital formation (FF) by cultivators in farm business.<sup>2</sup> Fixed capital formation per gross cropped area (FF/A) was computed for 1961-62 and 1971-72. An effort was then made to explain the growth in FF/A (FF/A growth was measured as the ratio of the value of the variable in 1971-72 to its value in 1961-62 and denoted by  $(FF/A)'$ ).

In the regression analysis, three independent variables were tried. One, as discussed above, was the change in the proportion of area irrigated (MRP). This represented a proxy for the technological change taking place. Second, to capture the effects of the type of irrigation being introduced, the change in the



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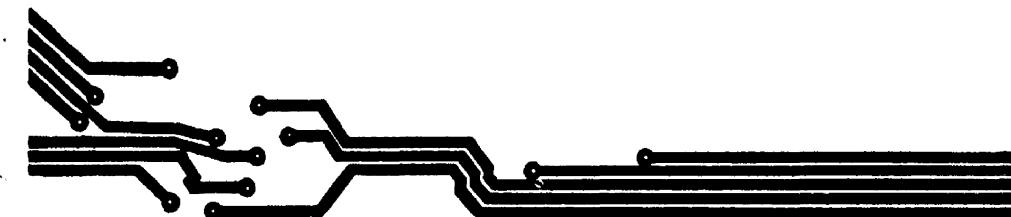




TABLE 19: IRRIGATION GROWTH AND NET FINANCIAL FLOWS

| States        | Net Irrigated Area (000 ha) |         |         |         | Net Inflow to Co-operatives<br>from Farm Households<br>(Rs crore) |         |         | Gross Co-operative Credit<br>Flow to Farm Households<br>(Rs crore) |         |            |
|---------------|-----------------------------|---------|---------|---------|---|---------|---------|--|---------|------------|
|               | 1961-62                     | 1965-66 | 1971-72 | 1976-77 | 1961-62   | 1971-72 | 1977-78 | 1961-62  | 1971-72 | 1977-78    |
| Punjab        |                             | 2263    | 2954    | 3194    |   | - 4.02  | + 3.99  |  | 13.18   | 7.00       |
| Gujarat       | 741                         | 1041    | 1407    | 1233    | - 4.34  | - 14.23 | + 25.00 | 7.63   | 31.53   | Negligible |
| Karnataka     | 909                         | 975     | 1598    | 1215    | - 3.02  | - 13.30 | - 10.95 | 4.42   | 17.91   | 18.32      |
| Haryana       |                             | 1167    | 1565    | 1798    |   | - 6.07  | - 16.12 |  | 8.02    | 22.81      |
| Uttar Pradesh | 4803                        | 5874    | 6989    | 8260    | - 4.75  | - 21.71 | - 19.67 | 6.41   | 32.54   | 48.70      |

Note: Co-operative flows are 3-year averages around the year shown.

Sources: (1) India, *Statistical Abstracts of India*.

(2) Appendix 2.

proportion of area irrigated by wells (W) was considered: well irrigation involves, in general, greater private investment than canal and tank irrigation and is associated, moreover, with a more intensive use of inputs. Third, an attempt was made to capture the effect of institutional factors on private investment. The variable used was a measure of inequality in asset distribution. The expectation here was that *ceteris paribus* higher inequality should promote greater investment. The regression results, however, showed the opposite, though the variable was not statistically significant. The result reflected the fact that States with relatively low inequality, such as Punjab, Haryana and Gujarat, increased investment relatively rapidly, whereas in high inequality States, such as Tamil Nadu and Andhra Pradesh, investment growth was sluggish.

In the result finally presented, we have considered only IRP and W. The results are given in Table 18. Our hypothesis is borne out quite strikingly. The  $R^2$  is very high which implies that the independent variable, i.e., (FF/A). The coefficients of the individual variables are also highly significant.

About a quarter of the fixed capital formation expenditure goes directly into providing irrigation. It is unlikely, therefore, that this expenditure would dominate total expenditure to a degree that would make the above regressions tend towards tautology. Even so, to take care of the possibility, expenditure on irrigation was removed from total expenditure, and the resultant variable (FN/A) was regressed once more on IRP and W.<sup>14</sup> This regression (shown in Table 18) also gave very good results.

Change in technology, as represented by the extent and composition of irrigation, therefore, do have an important impact on the growth of both aggregate and non-irrigation investment.

It may be noted here that irrigation appears to be a specially good proxy for

technology in Punjab and Haryana. When these States are dropped from the analysis, the explanatory power of the model falls (see Table 18). However, the estimated equations indicate that irrigation growth has had a strong influence on physical investment growth even in other States.

If irrigation determines the technology of agricultural production, the further question that arises is: what determines irrigation? Irrigation development may be undertaken by the government or it may be undertaken privately. In either case, growth in irrigated area will be constrained by environmental factors, i.e., climatic and geo-structural factors. Private investment will be further constrained by the level of infrastructure, rural electrification for example. In addition, private investment in irrigation will be influenced by the state of knowledge in crop production, which, in turn, determines the expected returns from investment. Thus the availability of high yielding varieties, not associated with usually high risks, may induce investment in irrigation.

To the farmer, therefore, technology is *exogenously* given by the environment, the infrastructure, and the state of knowledge. These then represent the basic factors determining investment and production growth in agriculture. The environmental factors are, in particular, a major constraining factor. 'In a country like India that has had a long tradition of irrigation, and where past investments have already exploited a large part of the more easily available water resources, not only is the scope for further extension more limited than in some other countries, but is likely to be much more costly' (Raj, 1970, p 122).

Before closing this section, one possible link (suggested above) between physical and financial investment may be noted. The slowing down of irrigation growth during the 1970s in Punjab, Gujarat and Karnataka has been accompanied by increased investment in finan-

cial assets by the agricultural households of these States (see Table 19). On the other hand, continued irrigation development in Haryana and Uttar Pradesh has been accompanied by a net drawing in of financial resources into these States (see Table 19).

## V Summary and Implications

In this paper, we tried to explore some dimensions of the rural savings and investment behaviour. Here we first summarise our findings. In doing so, we try particularly to link the findings at the different stages of the analysis. On the basis of the understanding thus acquired, we examine the consistency of the relevant Sixth Plan targets.

The major points emerging from the paper are:

### (1) Aggregate savings:

The rural savings rate has shown no perceptible secular tendency to rise during the last two decades. The rate has remained about 8-9 per cent. Within the rural households, agricultural households have had a slightly higher savings rate than non-agricultural households. Neither category of households shows a rising savings rate (see section 1).<sup>15</sup> The capacity of rural households to save has clearly been limited. The economy-wide savings rate has been significantly higher than the rural rate and has also been growing.

There are probably good reasons for a non-growing rural savings rate. But the significant feature emerging from our analysis, on which greater reliance can be placed, is the changing composition of rural savings. Before examining the composition, however, it is useful to look at the factors influencing aggregate savings.

The relatively steady rural savings rate is consistent with an almost stationary rural per capita real income (section 1). Our cross-section analysis showed that acceleration in production is accom-

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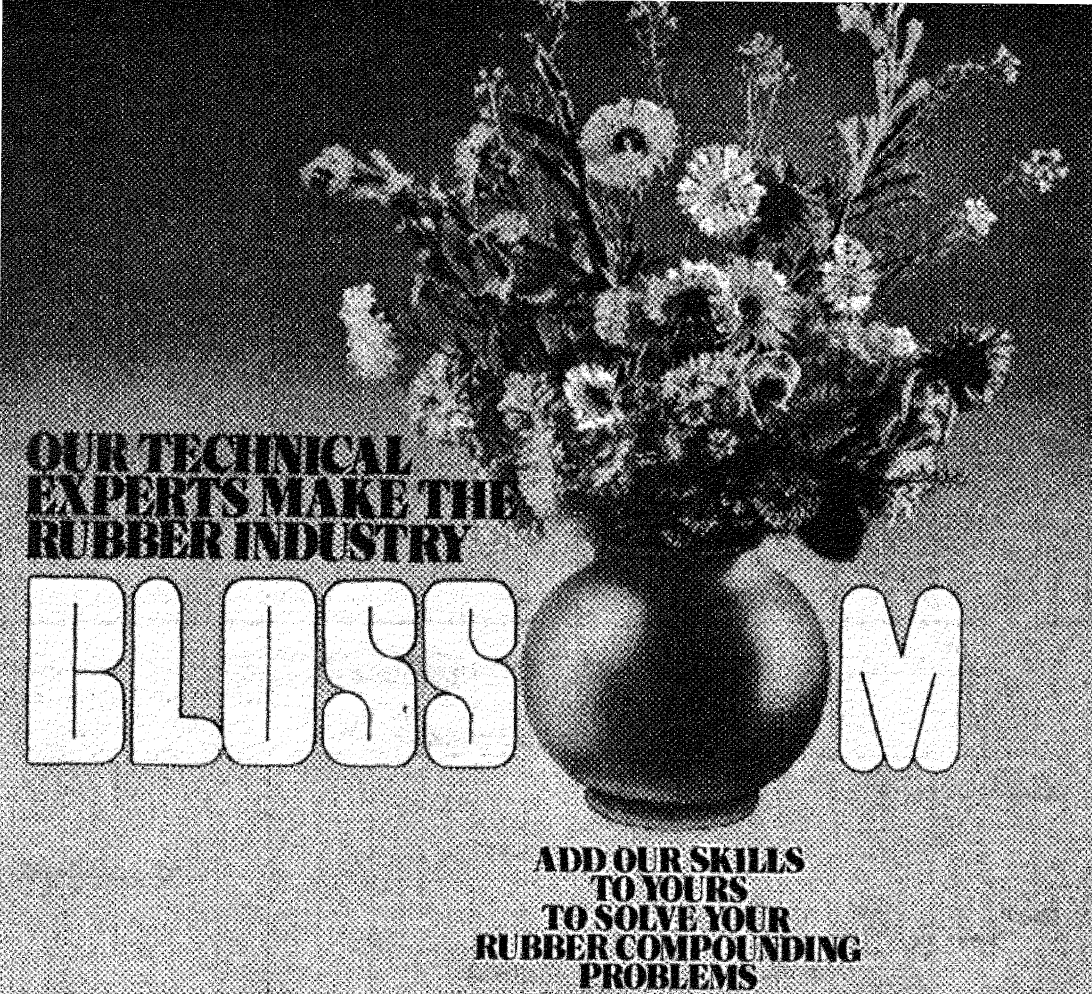
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APPENDIX TABLE 1: RURAL FINANCIAL ASSETS AND LIABILITIES FLOWS

(Rs crore)

| Years   | ASSETS        |                        |                               |                                   |                                    |                                    |                                  |  | LIABILITIES   |   |                         |                                    |                                |                 |                               |
|---------|---------------|------------------------|-------------------------------|-----------------------------------|------------------------------------|------------------------------------|----------------------------------|--|---|---|-------------------------|------------------------------------|--------------------------------|-----------------|-------------------------------|
|         | Cur-<br>rency | Life<br>Insur-<br>ance | Provi-<br>dent<br>Fund<br>etc | Small<br>Savings<br>and<br>Others | (Of<br>Which<br>Postal<br>Savings) | Co-op<br>Shares<br>and<br>Deposits | Commer-<br>cial Bank<br>Deposits | Gross<br>Formal<br>(Exter-<br>nal) Fin-<br>ancial<br>Savings | Infor-<br>mal (in-<br>ternal)<br>Financial<br>Savings | Total<br>Financial<br>Savings<br>(9) + (10) | Commer-<br>cial<br>Bank | Co-op-<br>opera-<br>tive<br>Credit | Gov-<br>ern-<br>ment<br>Credit | Total<br>Credit | Net Fin-<br>ancial<br>Savings |
| 1       | 2             | 3                      | 4                             | 5                                 | 6                                  | 7                                  | 8                                | 9<br>(2) to (8)<br>except<br>(6)                             | 10  | 11<br>(9) + (10)                            | 12                      | 13                                 | 14                             | 15              | 16<br>(9)-(15)                |
| 1961-62 | 32.80         | 21.87                  | 41.55                         | 1.08                              | (3.0)                              | 24.35                              | 8.93                             | 130.58   | 84  | 214.58                                      | 5.11                    | 56.86                              | 45                             | 106.97          | 23.61                         |
| 62-63   | 57.42         | 27.36                  | 51.98                         | -                                 | (1.20)                             | 24.99                              | 11.52                            | 172.40   | 88  | 260.40                                      | 6.79                    | 57.50                              | 48                             | 112.29          | 60.11                         |
| 63-64   | 71.51         | 28.08                  | 53.35                         | 2.04                              | (3.90)                             | 33.26                              | 14.85                            | 203.09   | 93  | 296.09                                      | 8.03                    | 71.30                              | 57                             | 130.33          | 72.76                         |
| 64-65   | 44.61         | 29.19                  | 55.46                         | 1.60                              | (4.30)                             | 39.81                              | 19.17                            | 189.84   | 98  | 287.84                                      | 13.01                   | 59.08                              | 55                             | 127.09          | 62.75                         |
| 65-66   | 94.84         | 26.91                  | 51.12                         | 18.11                             | (8.80)                             | 37.35                              | 24.73                            | 253.06   | 103   | 356.06                                      | 15.97                   | 101.46                             | 61                             | 178.43          | 74.63                         |
| 66-67   | 41.54         | 42.48                  | 80.71                         | 1.44                              | (5.80)                             | 35.35                              | 31.89                            | 201.52   | 109   | 310.52                                      | 20.98                   | 94.62                              | 68                             | 183.60          | 17.92                         |
| 67-68   | 53.06         | 44.87                  | 85.44                         | - 0.65                            | (5.90)                             | 62.99                              | 41.15                            | 286.96   | 114   | 400.96                                      | 28.26                   | 133.00                             | 74                             | 235.26          | 51.70                         |
| 68-69   | 89.52         | 55.08                  | 104.65                        | - 4.90                            | (5.00)                             | 57.32                              | 53.08                            | 354.75   | 120   | 474.75                                      | 37.58                   | 206.01                             | 80                             | 323.59          | 31.16                         |
| 69-70   | 110.84        | 58.53                  | 111.20                        | - 1.80                            | (7.70)                             | 46.59                              | 68.47                            | 393.83   | 127   | 520.83                                      | 49.99                   | 217.81                             | 87                             | 354.80          | 39.03                         |
| 70-71   | 113.58        | 65.97                  | 125.34                        | 16.50                             | (17.10)                            | 58.26                              | 88.33                            | 467.98   | 133   | 600.98                                      | 66.48                   | 185.85                             | 93                             | 345.33          | 122.65                        |
| 71-72   | 133.32        | 62.80                  | 119.32                        | 37.27                             | (21.30)                            | 67.08                              | 113.94                           | 533.73   | 140   | 673.73                                      | 88.42                   | 220.16                             | 99                             | 407.52          | 126.21                        |
| 72-73   | 210.27        | 76.70                  | 145.73                        | 60.03                             | (34.30)                            | 108.72                             | 146.99                           | 784.44   | 148   | 896.44                                      | 117.60                  | 239.90                             | 177                            | 534.50          | 213.94                        |
| 73-74   | 253.86        | 88.87                  | 168.85                        | 84.70                             | (48.40)                            | 70.69                              | 182.01                           | 848.98   | 155   | 1003.98                                     | 175.77                  | 142.34                             | 91                             | 409.11          | 439.87                        |
| 74-75   | 6.07          | 85.27                  | 162.01                        | 50.40                             | (28.80)                            | 108.18                             | 193.21                           | 605.98   | 165   | 770.98                                      | 210.15                  | 197.45                             | 78                             | 485.60          | 120.38                        |
| 75-76   | 103.42        | 105.55                 | 200.54                        | 105.35                            | (60.20)                            | 150.71                             | 296.15                           | 961.72   | 172   | 1133.72                                     | 278.21                  | 202.58                             | 82                             | 562.79          | 398.93                        |
| 76-77   | 376.13        | 131.02                 | 248.93                        | 70.52                             | (40.30)                            | 166.93                             | 386.26                           | 1379.79  | 181   | 1560.79                                     | 350.69                  | 433.41                             | 86                             | 870.10          | 509.69                        |
| 77-78   | 232.08        | 147.92                 | 281.04                        | 91.98                             | (52.10)                            | 181.75                             | 604.64                           | 1538.01  | 192   | 1730.01                                     | 500.41                  | 307.23                             | 98                             | 905.64          | 632.37                        |
| 78-79   | 472.06        | 170.75                 | 324.42                        | 107.97                            | (61.70)                            | 267.24                             | 737.00                           | 2,142.00   | 200   | 2342.00                                     | 741.52                  | 332.48                             | 119                            | 1192.00         | 950.00                        |
| 79-80   | 432.00        | 193.20                 | 367.11                        | 145.95                            | (83.40)                            |                                    |                                  |  | 213   |   | 760.96                  |                                    |                                |                 |                               |

Note: Postal savings are a part of small savings.



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APPENDIX TABLE 2: AGRICULTURAL FINANCIAL ASSETS AND LIABILITIES FLOWS

(Rs crore)

| Years   | Currency | Life Insurance | Provident Fund etc | Small Savings and Others | Co-op Shares and Deposits | Commercial Bank Deposits | Gross Formal Financial Savings | Commercial Bank Credit | Co-operative Bank | Govt. Credit | Total Credit | Net Financial Savings |
|---------|----------|----------------|--------------------|--------------------------|---------------------------|--------------------------|--------------------------------|------------------------|-------------------|--------------|--------------|-----------------------|
|         | 1        | 2              | 3                  | 4                        | 5                         | 6                        | 7<br>(1)to(6)                  | 8                      | 9                 | 10           | 11           | 12                    |
| 1961-62 | 18.70    | 13.38          | 20.03              | 0.80                     | 24.35                     | 5.09                     | 82.35                          | 2.22                   | 56.86             | 45           | 104.08       | - 21.73               |
| 62-63   | 33.87    | 16.74          | 25.05              | -0.64                    | 24.99                     | 6.80                     | 106.81                         | 3.04                   | 57.50             | 48           | 108.54       | - 1.73                |
| 63-64   | 43.62    | 17.18          | 25.71              | 1.50                     | 33.26                     | 9.06                     | 130.33                         | 4.17                   | 71.30             | 51           | 126.47       | 3.86                  |
| 64-65   | 28.10    | 17.88          | 26.73              | 1.18                     | 39.81                     | 12.08                    | 125.78                         | 5.80                   | 59.08             | 55           | 119.88       | 5.90                  |
| 65-66   | 61.65    | 16.47          | 24.64              | 13.35                    | 37.35                     | 16.07                    | 169.53                         | 7.71                   | 101.46            | 61           | 170.17       | - 0.64                |
| 66-67   | 27.83    | 26.00          | 30.90              | 1.06                     | 35.35                     | 21.37                    | 142.51                         | 10.71                  | 94.62             | 68           | 173.33       | - 30.82               |
| 67-68   | 36.61    | 27.52          | 41.18              | -0.48                    | 62.99                     | 28.39                    | 192.21                         | 14.66                  | 133.00            | 74           | 221.66       | - 25.45               |
| 68-69   | 63.56    | 33.71          | 50.44              | - 3.61                   | 57.32                     | 37.69                    | 238.11                         | 10.10                  | 206.01            | 80           | 306.11       | - 67.00               |
| 69-70   | 80.92    | 35.82          | 53.60              | - 1.33                   | 46.59                     | 49.98                    | 265.58                         | 35.52                  | 217.81            | 87           | 340.33       | - 74.75               |
| 70-71   | 85.18    | 40.37          | 60.41              | 12.16                    | 58.26                     | 66.25                    | 321.63                         | 29.71                  | 185.85            | 93           | 308.56       | 13.07                 |
| 71-72   | 102.66   | 38.43          | 57.51              | 27.47                    | 67.08                     | 87.73                    | 380.88                         | 51.67                  | 220.16            | 99           | 370.83       | 10.05                 |
| 72-73   | 161.91   | 46.94          | 70.24              | 44.24                    | 108.72                    | 113.18                   | 545.23                         | 70.78                  | 239.90            | 177          | 487.68       | 57.55                 |
| 73-74   | 195.47   | 54.39          | 81.39              | 62.42                    | 70.69                     | 140.15                   | 604.51                         | 86.69                  | 142.34            | 91           | 320.03       | 284.48                |
| 74-75   | 4.68     | 52.19          | 78.09              | 37.14                    | 108.18                    | 148.77                   | 429.05                         | 173.35                 | 197.45            | 78           | 448.80       | - 19.75               |
| 75-76   | 79.63    | 64.60          | 96.66              | 77.64                    | 150.71                    | 228.04                   | 697.28                         | 215.38                 | 202.58            | 82           | 449.96       | 197.32                |
| 76-77   | 289.62   | 80.18          | 119.98             | 51.97                    | 166.93                    | 297.42                   | 1006.10                        | 211.82                 | 433.41            | 86           | 731.23       | 145.16                |
| 77-78   | 178.70   | 90.53          | 135.46             | 67.20                    | 181.75                    | 465.57                   | 1165.86                        | 455.71                 | 307.23            | 98           | 860.94       | 304.92                |
| 78-79   | 363.49   | 104.50         | 156.37             | 79.57                    | 267.24                    | 567.49                   | 1600.99                        | 540.71                 | 332.48            | 119          | 991.00       | 609.99                |
| 79-80   |          | 118.25         | 176.95             | 107.57                   |                           |                          |                                | 472.05                 |                   |              |              |                       |

APPENDIX TABLE E 3: SHARES OF STATES IN SELECT FINANCIAL STOCKS HELD BY RURAL HOUSEHOLDS, 1971

(per cent)

| States           | Commercial Bank Deposits | Life Insurance Fund | Provident Fund | Post-Office Deposits | Commercial Bank Credit | Government Credit |
|------------------|--------------------------|---------------------|----------------|----------------------|------------------------|-------------------|
| Andhra Pradesh   | 7                        | 6                   | 2              | 0.7                  | 10.19                  | 3.52              |
| Assam            | 1                        | 3                   | 8              | 3                    | —                      | 3.04              |
| Bihar            | 14                       | 7                   | 10             | 7                    | 1.23                   | 5.66              |
| Gujarat          | 6                        | 8                   | 5              | 4                    | 13.24                  | 6.93              |
| Haryana          | 1                        | 1                   | 0.5            | 2                    | 2.57                   | 1.51              |
| Himachal Pradesh | 0.2                      | 0.5                 | 1              | 2                    | 0.36                   | —                 |
| Jammu & Kashmir  | 0.4                      | 0.4                 | 0.9            | 1                    | 0.01                   | 0.95              |
| Karnataka        | 3                        | 17                  | 2              | 0.9                  | 17.17                  | 9.52              |
| Kerala           | 17                       | 9                   | 9              | 2                    | 15.90                  | 1.78              |
| Madhya Pradesh   | 1                        | 3                   | 6              | 2                    | 3.31                   | 3.60              |
| Maharashtra      | 6                        | 5                   | 8              | 6                    | 5.97                   | 15.75             |
| Orissa           | 0.2                      | 0.7                 | 2              | 4                    | 0.53                   | 1.90              |
| Punjab           | 10                       | 2                   | 2              | 9                    | 7.51                   | 3.29              |
| Rajasthan        | 4                        | 7                   | 1              | 0.6                  | 1.84                   | 3.86              |
| Tamil Nadu       | 4                        | 7                   | 7              | 3                    | 8.93                   | 9.82              |
| Uttar Pradesh    | 12                       | 11                  | 11             | 28                   | 8.05                   | 14.79             |
| West Bengal      | 10                       | 12                  | 22             | 24                   | 1.65                   | 6.34              |

panied by rising savings rates (section 3). At the all-India level, there has been no acceleration in production during the last two decades. Indeed, there probably has been some deceleration in the 1970s. The relatively stable savings rate is once again consistent with the lack of acceleration in agricultural production.

It may be argued, of course, that though per capita income has not risen, distribution among farmers has very

probably worsened (on account of selective access of large farmers to modern production technology and associated supportive services), and that should give a boost to the savings rate. There probably is one basis to this argument. It is possible that our estimates do not adequately capture the new forms of investment being undertaken by rural households. There are, however, two points to be observed here. One is that the worsen-

ing distribution has also meant disinvestment by small farmers (section 4).

Second, as suggested by our cross-section analysis (section 3) there appear to have been limits to investment in formal financial assets (i.e., assets of regulated financial institutions) and also to investment in physical assets on the farm. Of course, the differences between limits to savings capacity and limits to investment opportunity is probably a close one. In the second half of the 1960s, after the calamitous mid-1960s, investment accompanying irrigation growth could not be financed by the internal resources of agricultural households. In the 1970s, constraints on investment in financial assets have reduced, but constraints on physical investment (particularly in some regions that were specially dynamic in the 1960s) have increased. To understand the constraints on the growth of physical farm investment, and the interplay between physical investment and financial flows, we looked into the matter a little more closely.

## (2) Physical farm investment:

Physical investment is closely related to changes in technology. In the Indian situation, we argued, irrigation growth is a good proxy for technical change. Statistical cross-section analysis did indeed show that fixed investment growth was related to growth in irrigation and to the changes in the nature of irrigation (increases in proportion of area irrigated by wells) (section 4). After significant in-

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APPENDIX TABLE 4: FINANCIAL SAVINGS OF RURAL HOUSEHOLDS—STATEWISE, 1971-92

| States            | Currency | Life Insurance<br>Premium | Provi-<br>dent<br>Fund | Small<br>Savings | Co-op<br>Shares<br>and<br>Deposits | Com-<br>mercial<br>Bank<br>Deposits | Gross<br>Formal<br>Financial<br>Savings | Com-<br>mercial<br>Bank<br>Credit | Co-op-<br>erative<br>Credit | Govern-<br>ment<br>Credit | Total<br>Credit | Net<br>Finan-<br>cial<br>Savings | Informal<br>Financial<br>Savings |
|-------------------|----------|---------------------------|------------------------|------------------|------------------------------------|-------------------------------------|---|-----------------------------------|-----------------------------|---------------------------|-----------------|----------------------------------|----------------------------------|
|                   |          |                           |                        |                  |                                    |                                     |   |                                   |                             |                           |                 |                                  |                                  |
|                   | 1        | 2                         | 3                      | 4                | 5                                  | 6                                   | 7                                       | 8                                 | 9                           | 10                        | 11              | 12                               | 13                               |
| Andhra Pradesh    | 9.32     | 4.0                       | 2.39                   | 0.26             | 2.59                               | 7.98                                | 26.54                                   | 10.19                             | 10.95                       | 3.75                      | 24.89           | 1.65                             | 25.3                             |
| Assam*            | 18.70    | 2.0                       | 9.55                   | 1.12             | —                                  | —                                   | 15.17                                   | —                                 | —                           | 3.21                      | 3.21            | 11.96*                           | —                                |
| Bihar             | 8.03     | 4.0                       | 11.93                  | 2.69             | 1.13                               | 16.00                               | 54.45                                   | 1.23                              | 9.83                        | 5.84                      | 16.90           | 37.55                            | 3.4                              |
| Gujarat           | 1.35     | 5.0                       | 5.97                   | 1.49             | 17.30                              | 6.87                                | 44.66                                   | 13.24                             | 31.53                       | 8.35                      | 63.12           | —                                | 16.9                             |
| Haryana           | —        | 1.0                       | 0.60                   | 0.75             | 1.95                               | 1.15                                | 6.80                                    | 2.57                              | 8.02                        | 1.76                      | 12.35           | —                                | 1.6                              |
| Himachal Pradesh* | —        | 0.0                       | 1.19                   | 0.75             | —                                  | —                                   | 2.47                                    | 0.36                              | —                           | —                         | 0.36            | —                                | —                                |
| Jammu & Kashmir*  | —        | 0.3                       | 1.07                   | 0.37             | —                                  | —                                   | 2.74                                    | 0.01                              | —                           | 1.00                      | 1.01            | —                                | —                                |
| Karnataka         | 3.99     | 11.0                      | 2.39                   | 0.34             | 4.61                               | 3.41                                | 25.74                                   | 17.17                             | 17.91                       | 10.24                     | 45.32           | —                                | 9.8                              |
| Kerala            | 22.69    | 6.0                       | 10.74                  | 0.75             | 3.94                               | 19.41                               | 63.53                                   | 15.90                             | 7.60                        | 1.80                      | 25.30           | 38.23                            | 1.7                              |
| Madhya Pradesh    | 1.35     | 2.0                       | 7.16                   | 0.75             | 4.32                               | 1.15                                | 16.73                                   | 3.31                              | 16.12                       | 3.76                      | 23.19           | —                                | 8.4                              |
| Maharashtra       | 8.03     | 3.0                       | 9.55                   | 2.24             | 12.80                              | 6.87                                | 42.49                                   | 5.97                              | 94.51                       | 16.58                     | 117.06          | —                                | 9.2                              |
| Orissa            | 0.27     | 0.4                       | 2.39                   | 1.49             | 1.18                               | 0.23                                | 5.96                                    | 0.53                              | 5.54                        | 2.12                      | 8.19            | —                                | 4.0                              |
| Punjab            | 13.48    | 1.0                       | 2.39                   | 3.35             | 9.16                               | 11.52                               | 40.90                                   | 7.51                              | 13.18                       | 3.66                      | 24.35           | 16.55                            | 2.3                              |
| Rajasthan         | 5.34     | 4.0                       | 1.19                   | 0.22             | 2.40                               | 4.56                                | 17.71                                   | 1.84                              | 5.91                        | 4.29                      | 11.99           | 5.72                             | 12.6                             |
| Uttar Pradesh     | 16.01    | 7.0                       | 13.13                  | 10.44            | 10.83                              | 13.69                               | 71.10                                   | 8.05                              | 32.54                       | 15.74                     | 56.33           | 14.77                            | 25.8                             |
| West Bengal       | 13.48    | 8.0                       | 26.25                  | 8.94             | 1.41                               | 11.52                               | 69.60                                   | 1.65                              | 0.83                        | 6.8                       | 9.16            | 59.84                            | 5.1                              |

Note: \*Information for Assam, Himachal Pradesh, and Jammu and Kashmir is not complete.



APPENDIX TABLE 5: SHARE OF CULTIVATOR HOUSEHOLDS IN RURAL FINANCIAL ASSETS AND LIABILITIES, 1971

| States           | (per cent)                          |                             |                        |                            |                                   |                           |
|------------------|-------------------------------------|-----------------------------|------------------------|----------------------------|-----------------------------------|---------------------------|
|                  | Com-<br>mercial<br>Bank<br>Deposits | Life In-<br>surance<br>Fund | Provi-<br>dent<br>Fund | Post<br>Office<br>Deposits | Com-<br>mercial<br>Bank<br>Credit | Govern-<br>ment<br>Credit |
| Andhra Pradesh   | 0.99                                | 62.07                       | 25.76                  | 57.14                      | 0.98                              | 0.93                      |
| Assam            | —                                   | 83.33                       | 68.83                  | 82.76                      | —                                 | 0.94                      |
| Bihar            | 0.98                                | 81.13                       | 72.24                  | 84.85                      | 0.98                              | 0.95                      |
| Gujarat          | 0.52                                | 75.86                       | 29.77                  | 36.36                      | 0.99                              | 0.97                      |
| Haryana          | 0.72                                | 70.00                       | 38.46                  | 6.25                       | 1.00                              | 0.83                      |
| Himachal Pradesh | —                                   | 85.71                       | 74.07                  | 85.00                      | —                                 | 0.95                      |
| Jammu & Kashmir  | —                                   | 66.67                       | 80.00                  | 76.92                      | 1.00                              | 0.93                      |
| Karnataka        | 0.92                                | 59.07                       | 50.00                  | 37.50                      | 0.83                              | 0.99                      |
| Kerala           | 0.96                                | 87.50                       | 77.27                  | 86.36                      | 0.99                              | 0.96                      |
| Madhya Pradesh   | 0.77                                | 45.00                       | 37.65                  | 52.17                      | 1.00                              | 0.95                      |
| Maharashtra      | 0.34                                | 49.28                       | 19.55                  | 59.02                      | 1.00                              | 0.90                      |
| Orissa           | 1.00                                | 90.00                       | 63.64                  | 89.47                      | 1.00                              | 0.96                      |
| Punjab           | 0.56                                | 37.14                       | 21.82                  | 47.73                      | 1.00                              | 0.86                      |
| Rajasthan        | 0.85                                | 45.54                       | 37.50                  | 16.67                      | 0.93                              | 0.90                      |
| Tamil Nadu       | 0.98                                | 57.94                       | 29.78                  | 60.00                      | 0.95                              | 0.96                      |
| Uttar Pradesh    | 0.68                                | 52.10                       | 51.85                  | 77.61                      | 1.00                              | 0.94                      |
| West Bengal      | 0.71                                | 43.50                       | 42.88                  | 90.43                      | 1.00                              | 0.95                      |

crease in irrigated, particularly wells irrigated area, during the 1960s, there has been a slowdown in the 1970s.<sup>16</sup> Even in the 1960s, the investment growth (according to our data) was sluggish. The slowdown in irrigation growth in the 1970s has contributed to continued sluggishness in farm investment growth. The slowdown has been particularly sharp in Punjab, Gujarat, and Karnataka—States that had experienced rapid irrigation expansion in 1960s (section 4). As has been noted in section 4, however, the slowly growing capital formation has embodied significant technological changes particularly modern machinery and equipment).

With constraints operating on fixed farm investment, there has been an increasing tendency to shift to investment in farm working capital, non-farm business, durable household assets and formal financial assets (sections 2 and 4).

### (3) *Formal (external) financial flows:*

The rural sector was a net recipient of financial resources from other sectors in the 1960s, particularly in the second half of that decade. The resource inflow was mainly into agricultural households, as non-agricultural rural households were, and have continued to be, net lenders of financial resources. In the 1970s, there has been a sharp change in the case of agricultural households. From net recipients, these households have turned into net lenders, and the extent of net lending has grown over the 1970s. Net financial savings (i.e., net lending) of agricultural households have increased as a proportion of physical asset formation by agri-

cultural households as well as a proportion of net financial savings of the household section as a whole (section 2).

In an earlier exercise (Mody 1981), we had estimated that during the 1960s the agricultural sector was a net recipient of resources not only through financial institutions but also on government account and via the favourable movement of terms of trade. In the 1970s, in addition to net outflow through financial institutions, available evidence suggests an unfavourable terms of trade movement; however, the direction of the *overall* net flow can be determined only after considering government flows. Our focus in this paper has been on flows through financial institutions.

The large inflow of resources during the second half of the 1960s was mainly through the co-operatives. Co-operative credit increase during that period took principally the form of medium-term and long-term loans, rather than short-term loans, and clearly supported the renewal of agricultural growth, based on expansion of irrigation, particularly in Punjab, Haryana, Uttar Pradesh and Karnataka.

An inter-State analysis also shows that the net drawing in of financial resources from outside the sector increases during phases of irrigation investment based growth and, conversely, net financial savings increase as irrigation expansion and growth slow down (section 4).

In the 1970s, the co-operatives continued to be net contributors of financial resources to the agricultural sector. But the extent of annual net inflow did not increase and probably was even declining in

trend (section 2). Our analysis would suggest that this was related to the slowdown in irrigation investment in the 1970s. (The slowdown of net inflow into Maharashtra, a major drawer of resources, was probably related to mounting overdues in that State.) Of course, gross credit from commercial banks increased rapidly during the 1970s. But deposits in commercial banks increased equally rapidly such that commercial banks continued to be, as in the 1960s, net recipients of resources from agricultural households.<sup>17</sup> At the same time, financial savings in currency, life insurance premia, and provident fund, continued to increase, contributing to the increasing net outflow from agriculture (section 2).

The difference between the 1960s and 1970s outlined above may, therefore, be summarised as follows: Private physical investment has grown slowly right through; however, given the limited savings capacity in the late 1960s, even the limited growth required external resources; in the 1970s, with the growth of incomes of large cultivators, and the probable deceleration in physical investment, net financial resources have been flowing out of agriculture.

This is one part of the story. The other major influence on formal financial savings has been the physical spread of the formal financial institutions. This may now be considered.

### (4) *'Formal' and 'informal' savings:*

We have defined 'informal' savings as those relating to transactions within the rural sector and which, therefore, do not show up as net savings of the sector, we considered internal lending and borrowing and internal sale and purchase of land. Gross informal savings as a proportion of gross formal financial savings have declined over time (section 2).

The cross-section analysis (section 3) suggested that rising per capita income is generally accompanied by a relative decline in informal savings. At the all-India level we find, however, a decline in informal savings despite no perceptible increase in real per capita income. It appears, therefore, that the increasing presence of formal financial institutions in rural areas has resulted in the drawing away of savings from informal channels to the formal institutions. (One wonders whether this has meant disinvestment in physical assets by small farmers.)

A strategy for resource mobilisation from agriculture, would, however, have to be cautious in extrapolating from past trends in this regard. The further shift away from informal savings channels would depend not just on continued increases in the physical presence of formal

APPENDIX TABLE 6: FINANCIAL SAVINGS OF AGRICULTURAL HOUSEHOLDS—STATEWISE, 1971-72  
(Rs crore)

| States            | 1        | 2                         | 3                 | 4                | 5                                   | 6                           | 7                                       | 8                         | 9                      | 10                   | 11              | 12                       |
|-------------------|----------|---------------------------|-------------------|------------------|-------------------------------------|-----------------------------|---|---------------------------|------------------------|----------------------|-----------------|--------------------------|
|                   | Currency | Life Insurance<br>Premium | Provident<br>Fund | Small<br>Savings | Co-op.<br>Shares<br>and<br>Deposits | Commercial Bank<br>Deposits | Gross<br>Formal<br>Financial<br>Savings | Commercial Bank<br>Credit | Co-operative<br>Credit | Government<br>Credit | Total<br>Credit | Net Financial<br>Savings |
| Andhra Pradesh    | 9.22     | 2.48                      | 0.62              | 0.15             | 2.59                                | 7.88                        | 22.94                                   | 8.82                      | 10.95                  | 3.52                 | 23.29           | - 0.35                   |
| Assam*            | 18.33    | 1.66                      | 6.59              | 0.93             | —                                   | —                           | 10.58                                   | —                         | —                      | 3.04                 | 3.04            | 7.54*                    |
| Bihar             | 4.15     | 3.24                      | 8.59              | 2.22             | 1.13                                | 15.67                       | 49.18                                   | 1.06                      | 9.83                   | 5.66                 | 16.55           | 32.63                    |
| Gujarat           | 0.97     | 3.80                      | 1.79              | 0.54             | 17.30                               | 3.55                        | 31.13                                   | 11.58                     | 31.53                  | 6.93                 | 50.04           | - 18.91                  |
| Haryana           | —        | 0.70                      | 0.23              | 0.05             | 1.95                                | 0.83                        | 4.73                                    | 2.27                      | 8.02                   | 1.51                 | 11.80           | - 7.07                   |
| Himachal Pradesh* | —        | 0.26                      | 0.88              | 0.64             | —                                   | —                           | 2.28                                    | —                         | —                      | —                    | —               | 2.28*                    |
| Jammu & Kashmir*  | —        | 0.20                      | 0.86              | 0.28             | —                                   | —                           | 2.14                                    | 0.01                      | —                      | 0.95                 | 0.96            | 1.18*                    |
| Karnataka         | 3.67     | 6.49                      | 1.20              | 0.13             | 4.61                                | 3.13                        | 20.23                                   | 12.59                     | 17.91                  | 9.52                 | 40.02           | - 19.79                  |
| Kerala            | 21.78    | 5.28                      | 8.27              | 0.65             | 3.94                                | 18.62                       | 58.54                                   | 13.91                     | 7.60                   | 1.78                 | 23.29           | 35.25                    |
| Madhya Pradesh    | 1.02     | 0.90                      | 2.72              | 0.39             | 4.32                                | 0.88                        | 10.23                                   | 2.93                      | 16.12                  | 3.60                 | 22.65           | - 12.42                  |
| Maharashtra       | 2.75     | 1.47                      | 1.91              | 1.32             | 12.80                               | 2.35                        | 22.60                                   | 5.28                      | 94.51                  | 15.75                | 115.54          | - 92.94                  |
| Orissa            | 0.27     | 0.38                      | 1.53              | 1.33             | 1.18                                | 0.23                        | 4.90                                    | 0.47                      | 5.54                   | 1.90                 | 7.91            | 3.01                     |
| Punjab            | 7.55     | 0.37                      | 0.53              | 1.61             | 9.16                                | 6.45                        | 25.67                                   | 6.64                      | 13.18                  | 3.29                 | 23.10           | 2.57                     |
| Rajasthan         | 4.53     | 1.84                      | 0.45              | 0.04             | 2.40                                | 3.87                        | 13.13                                   | 1.51                      | 5.91                   | 3.86                 | 11.28           | 1.85                     |
| Tamil Nadu        | 5.23     | 2.32                      | 2.42              | 0.67             | 5.96                                | 4.47                        | 21.07                                   | 7.49                      | 28.02                  | 9.82                 | 45.33           | - 24.26                  |
| Uttar Pradesh     | 10.89    | 3.64                      | 6.83              | 8.14             | 10.83                               | 9.31                        | 49.64                                   | 7.12                      | 32.54                  | 14.79                | 54.45           | - 4.81                   |
| West Bengal       | 9.59     | 3.52                      | 11.29             | 8.05             | 1.41                                | 8.21                        | 42.07                                   | 1.46                      | 0.83                   | 6.34                 | 8.63            | 33.44                    |

Note: \*Information for Assam, Himachal Pradesh and Jammu and Kashmir is not complete.

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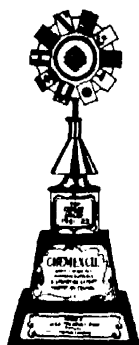
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APPENDIX TABLE 7: SAVINGS OF HOUSEHOLD SECTOR IN FORM OF FINANCIAL ASSETS

| Year    | Saving of the Household Sector in Finance Assets (Gross) | Currency | Bank Deposits | LIC Fund | PF Funds | Corporate & Co-operative Securities | Financial Liabilities of Household Sector | Saving of Household Sector in Financial Assets (Net) |
|---------|--|----------|---------------|----------|----------|-------------------------------------|---|--|
|         | 1  | 2        | 3             | 4        | 5        | 6                                   | 7   | 8  |
| 1961-62 | 650.4  | 99.4     | 207.4         | 72.9     | 113.5    | 69.2                                | 129.0                                     | 521.4  |
| 62-63   | 737.9  | 174.3    | 176.7         | 91.2     | 128.8    | 23.7                                | 226.4                                     | 511.5  |
| 63-64   | 1025.4   | 216.7    | 293.2         | 93.6     | 155.4    | 112.8                               | 274.6                                     | 750.8  |
| 64-65   | 911.0  | 135.2    | 336.4         | 97.3     | 181.5    | 12.0                                | 250.3                                     | 660.7  |
| 65-66   | 1091.0   | 287.4    | 363.7         | 89.7     | 198.2    | 19.0                                | 253.2                                     | 837.8  |
| 66-67   | 1086.2   | 125.9    | 437.8         | 141.6    | 206.9    | 9.0                                 | 337.3                                     | 748.9  |
| 67-68   | 1178.0   | 160.8    | 408.1         | 149.9    | 261.8    | 32.6                                | 358.1                                     | 819.9  |
| 68-69   | 1321.0   | 271.3    | 411.4         | 183.6    | 267.0    | 7.5                                 | 501.9                                     | 819.1  |
| 69-70   | 1514.2   | 335.9    | 586.8         | 195.1    | 350.8    | - 5.6                               | 646.9                                     | 867.3  |
| 70-71   | 1948.1   | 344.2    | 775.9         | 219.9    | 416.2    | 17.0                                | 618.8                                     | 1328.3   |
| 71-72   | 2347.6   | 404.0    | 1023.9        | 251.2    | 474.3    | 17.8                                | 724.3                                     | 1623.3   |
| 72-73   | 3004.2   | 637.2    | 1214.4        | 306.8    | 523.4    | 21.9                                | 635.9                                     | 2368.3   |
| 73-74   | 3631.5   | 769.3    | 1510.9        | 355.5    | 603.0    | - 5.3                               | 803.7                                     | 2800.8   |
| 74-75   | 3402.1   | 18.4     | 1653.9        | 343.9    | 786.6    | 58.5                                | 801.4                                     | 2600.7   |
| 75-76   | 4753.7   | 313.4    | 2787.4        | 422.2    | 1070.3   | 21.6                                | 1075.4                                    | 3678.3   |
| 76-77   | 6905.1   | 1139.8   | 3920.0        | 524.1    | 1171.6   | - 13.2                              | 1710.3                                    | 5194.8   |
| 77-78   | 7112.6   | 703.3    | 3535.2        | 591.7    | 1315.8   | 199.7                               | 1669.5                                    | 5443.1   |
| 78-79   | 9240.1   | 1430.5   | 4309.4        | 683.0    | 1605.3   | 201.0                               | 2495.1                                    | 6745.0   |
| 79-80   | 10092.5  | 1309.1   | 4510.4        | 772.9    | 1764.8   | 267.9                               | 3217.2                                    | 6875.3   |
| 80-81   | 11703.2  | 1665.7   | 5679.7        | 875.3    | 2069.1   | 226.8                               | 3116.1                                    | 8587.1   |

APPENDIX TABLE 8: RURAL GROSS DOMESTIC PRODUCT AT FACTOR COST  
(Rs crore)

| Table   | Agriculture | Non-Agriculture, Rural | Rural |
|---------|-------------|------------------------|-------|
| 1961-62 | 6966        | 2264                   | 9230  |
| 62-63   | 7111        | 2311                   | 9422  |
| 63-64   | 8235        | 2676                   | 10911 |
| 64-65   | 10091       | 3280                   | 13371 |
| 65-66   | 9798        | 3184                   | 12982 |
| 66-67   | 11713       | 3807                   | 15520 |
| 67-68   | 14542       | 4726                   | 19268 |
| 68-69   | 14146       | 4597                   | 18743 |
| 69-70   | 15539       | 5050                   | 20589 |
| 70-71   | 16727       | 5436                   | 22163 |
| 71-72   | 17320       | 5629                   | 22949 |
| 72-73   | 19009       | 6178                   | 25187 |
| 73-74   | 25583       | 8314                   | 33897 |
| 74-75   | 28122       | 9140                   | 37262 |
| 75-76   | 25963       | 8438                   | 34401 |
| 76-77   | 27777       | 9028                   | 36805 |
| 77-78   | 31836       | 10347                  | 42183 |
| 78-79   | 31618       | 10276                  | 41894 |

Note: Figures at current prices.

financial institutions in rural areas, but also on the nature of growth. Our cross-section analysis shows that high levels of inequality, as in Tamil Nadu and Andhra Pradesh, are associated with continued high levels of informal savings (section 3).

#### (5) Sixth Plan and the future:

The sixth plan targets of relevance to us are those related to irrigation, household financial savings, and agricultural credit. Our analysis above suggests some important links between these variables. The Plan document itself does not discuss

these links and, in fact, does not even go into the question of rural households' financial savings. In our discussion below on the consistency of the Plan targets, we do not therefore attempt any precise quantitative assessment and confine ourselves to qualitative judgements.

The savings capacity of agricultural households is yet limited. Our analysis suggests that any effort at a significant technological upgradation of Indian agriculture through large increases in irrigated area (and through investment in drainage and flood control) is likely to re-

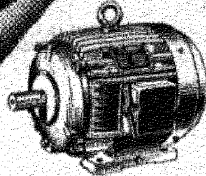
quire significant financial resource inflow into agriculture. Irrigation development in the 1960s had required a net resource inflow into agriculture, and it is only with the slowdown in irrigation growth, particularly in some important States, that the net financial savings of agricultural households have become positive and significant. The only State that has been able to maintain high investment and growth without a net draft of external resources has been Punjab—though, even in Punjab, net financial outflow has increased as irrigation growth has slowed down.

The large planned increase of net 'household' financial savings during 1980-85 will probably not be achieved if a serious attempt is made at achieving irrigation targets. According to the Plan, 2.5 million hectares of net irrigation potential and utilisation are to be created each year. This is a target more than four times the realised annual increases during the last two decades. If irrigation of this order is created, the resources required, for private investment in agriculture will almost certainly be extremely large. Considerable credit will have to be pumped into agriculture and the agricultural sector, will in all probability, turn from a net lender of resources to the rest of the economy to a net borrower. Thus there clearly is an incompatibility between the irrigation targets and the 'household' net financial savings targets.

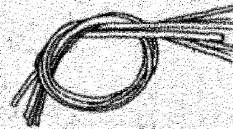
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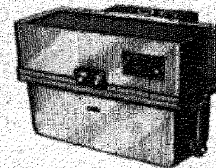
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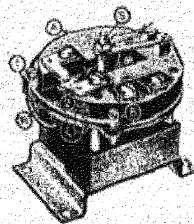
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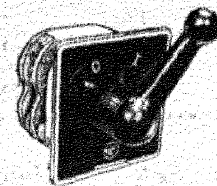
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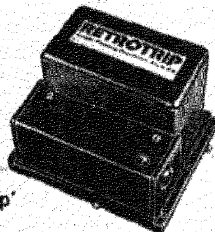
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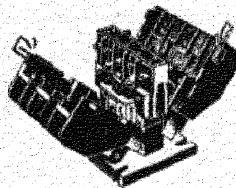
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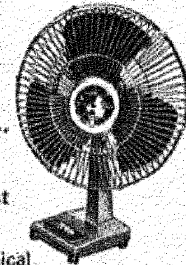
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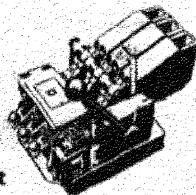
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for AC3 and AC4 duty, suitable for  
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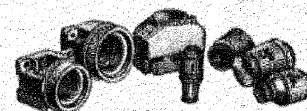
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APPENDIX TABLE 9: RURAL SAVINGS, INCOME, AND POPULATION, 1971-72

| States           | Total Savings (Rs crore) |       |        | Agricultural<br>(Rs crore) | Population<br>(million) |       |
|------------------|--------------------------|-------|--------|----------------------------|-------------------------|-------|
|                  | A                        | NAR   | R      |                            | A                       | R     |
|                  | 1                        | 2     | 3      | 4                          | 5                       | 6     |
| Andhra Pradesh   | 62.25                    | 9.2   | 71.45  | 1,463.28                   | 28.08                   | 35.10 |
| Assam            |                          |       |        |                            |                         |       |
| Bihar            | 156.83                   | 10.72 | 167.55 |                            | 50.14                   | 50.72 |
| Gujarat          | 99.99                    | 24.35 | 124.34 | 937.59                     | 16.13                   | 19.20 |
| Haryana          | 57.53                    | 8.96  | 66.49  | 566.32                     | 6.53                    | 8.26  |
| Himachal Pradesh |                          |       |        |                            |                         |       |
| Jammu & Kashmir  |                          |       |        |                            |                         |       |
| Karnataka        | 117.81                   | 7.51  | 125.32 | 984.95                     | 18.63                   | 22.18 |
| Kerala           | 89.25                    | 5.38  | 94.63  | 579.03                     | 10.91                   | 17.88 |
| Madhya Pradesh   | 121.48                   | 11.96 | 133.44 | 1,256.20                   | 31.03                   | 34.87 |
| Maharashtra      | 22.16                    | 29.37 | 51.53  | 1,081.89                   | 29.15                   | 34.70 |
| Orissa           | 33.19                    | 4.38  | 37.57  | 653.06                     | 17.29                   | 20.10 |
| Punjab           | 103.87                   | 32.40 | 136.27 | 877.10                     | 8.27                    | 10.34 |
| Rajasthan        | 122.75                   | 7.67  | 130.42 | 795.11                     | 18.46                   | 21.22 |
| Tamil Nadu       | 51.74                    | 23.21 | 74.95  | 1,066.96                   | 22.70                   | 28.73 |
| Uttar Pradesh    | 308.49                   | 46.88 | 355.37 | 2,511.68                   | 66.08                   | 75.95 |
| West Bengal      | 113.94                   | 42.10 | 156.04 | 1,464.50                   | 27.35                   | 33.35 |

APPENDIX TABLE 10: MATERIAL INPUTS IN AGRICULTURE

|         | (Rs crore)                                  |  |                   |
|---------|---|--|-------------------|
|         | Increase in Annual Value of Material Inputs | Increase in Working Capital on Assumption of 4 Month Turn-over | 6 Month Turn-over |
| 1961-62 | 90  | 30   | 45                |
| 62-63   | 122   | 40   | 61                |
| 63-64   | 114   | 38   | 57                |
| 64-65   | 285   | 94   | 143               |
| 65-66   | 105   | 35   | 53                |
| 66-67   | 465   | 153  | 233               |
| 67-68   | 416   | 137  | 208               |
| 68-69   | 37  | 12   | 19                |
| 69-70   | 439   | 145  | 220               |
| 70-71   | 315   | 104  | 167               |
| 71-72   | 279   | 92   | 140               |
| 72-73   | 279   | 182  | 256               |
| 73-74   | 1247  | 412  | 623               |
| 74-75   | 1644  | 542  | 822               |
| 75-76   | -ve   | -ve  | -ve               |
| 76-77   | 633   | 219  | 331               |
| 77-78   | 674   | 222  | 337               |
| 78-79   | 465   | 153  | 232               |

Note: Increase of inputs in 1965-66 is the value of inputs in 1965-66 minus the value of inputs in 1964-65.

Source: CSO National Accounts Statistics, disaggregated statements.

rigation generates larger incomes. This will depend very much on the relationship between investment, income and population.

The incompatibility will also be reduced if the credit structure is rationalised. The high level of overdues have been at-

tributed to wasteful use and wilful default. Our own analysis suggests that the regional distribution of credit in some instances, has not been related to credit requirements (section 3). Our analysis also indicates that credit taken by large farmers in high inequality areas probably finances dissaving of poorer households rather than production increases.<sup>18</sup> Some analysts have, in addition, argued that credit only displaces private savings (Adams 1978, Bhalla 1979).

To what extent the above parameters can be changed, it is difficult to judge. As of now, we can only assess the prospects on the basis of past performance, which does show a link between investment and growth on the one hand, and credit on the other. Credit, of course, mainly facilitates. The ultimate constraints lie in environmental, infrastructural and technological factors. The targets that probably will not be met are the irrigation targets. To that extent, a continued outflow of financial resources from agriculture may be expected.

#### Appendix 1: Rural Physical Investment

The Central Statistical Organisation (CSO) prepares estimates of private capital formation in agriculture. Essentially these estimates are based on RBI's *Debt and Investment Survey* of 1961-62. The estimates prepared for 1961-62 on the basis of the Survey results are 'carried forward' using a combination of indicators (population, gross sown area, etc).

Since 1961-62, the survey results of 1971-72 too have become available. The

CSO does not appear to have incorporated the 1971-72 findings in its estimates of private capital formation of, agriculture.

Two choices, therefore, exist. The CSC series could be used. On the other hand the RBI has stressed that the 1961-62 and 1971-72 estimates are completely comparable (on this we have more to say below). As such, an implicit growth ratio between 1961-62 and 1971-72 could be worked out, and this rate could be used to derive estimates for the other years.

A series based on a single point estimate and moved forward by indicators (as the CSO series) has limited analytical use. The relationships of interest are already built into the series (so Rudra, 1963, pp 1273-4).

The procedure we have adopted, therefore, is the second one outlined above. The only justification for this procedure is that it uses more of the direct available evidence on rural and agricultural capital formation.

Of course, this is not to deny the risk in estimating a trend from just two time points of available information. Thus, to ensure some degree of firmness, the comparability of the two estimates must be established. According to the RBI, "since both the surveys were planned with an eye of comparability", the concepts and definitions of capital expenditure in the two surveys are the same (see RBI, 1978 p 122). The only possible source of vitiation in comparability could be the sample designs of the two surveys.

In essence, the 1961-62 survey covered a smaller number of villages than the 1971-72 survey. But, within each village the 1961-62 survey canvassed a large number of households. In the 1961-62 survey, the households were not stratified before sampling, but in the 1971-72 survey, since the sample households were fewer in number, the households were stratified to reduce estimation bias particularly the underestimation through underrepresentation of the richer households.

The coverage of a larger number of villages in 1971-72 was mainly to provide estimates for agro-climatic regions within a State and not because the number of villages covered in the 1961-62 survey were considered inadequate for arriving at State estimates.

The implications of the household sampling need to be examined, particularly with a view to understanding whether the 1971-72 design could lead to an underestimation of capital expenditure. This is because the 1971-72 estimates implies a low growth rate of capital formation during the 1960s leading in fact to a declining investment

As outlined above, the 1971-72 sample size was smaller, but this deficiency as sought to be made up by stratifying households. It appears unlikely that 1971-72 estimate could be an underestimate, since stratification ensured adequate representation of the richer households that undertake the bulk of the investment.

A further objection to comparing just to years could be that the conditions prevailing in the two years were very different. The best measure for the prevailing conditions seems to be the magnitude of agricultural production. As indicated in the accompanying table, 1961-62 and 1971-72 were very similar in this regard. Both were years of high production after a significant rise in the earlier years. Both were followed by significant declines in production.

#### Index Numbers of Agricultural Production

Drop Year Ending Triennium Ending  
1950 = 100 1961-62 = 100

|         |     |         |     |
|---------|-----|---------|-----|
| 1959-60 | 130 | 1969-70 | 123 |
| 1960-61 | 142 | 1970-71 | 131 |
| 1961-62 | 145 | 1971-72 | 130 |
| 1962-63 | 138 | 1972-73 | 119 |

Source: India, *Economic Survey*, various issues.

Finally, the coverage of our estimate of gross physical investment should be noted. The *Debt and Investment Surveys* report an estimate of gross capital expenditure. From this estimate, the expenditure on purchase of land and land rights as deducted, on the assumption that the bulk of the land transactions were between rural households. (Expenditure on purchase of land does not represent investment for the sector as a whole as long as the transaction is between rural households.) The estimate thus derived is used as the measure of gross physical investment.

It should be noted that our estimate includes expenditure on purchase of livestock. Clearly, this would lead to an overestimation of physical investment if some part of the purchase of livestock represents only a transfer of assets. However, at least a part of this overestimation would tend to balance the underestimation due to non-inclusion of investment in inventories and the omission of purchase of land from the urban sector.

The gross expenditure includes expenditure on repairs and maintenance. It was clear how much of this represented replacement of depreciated capital stock and how much was basically current ex-

penditure for upkeep and maintenance, if such a distinction can at all be made.

#### Appendix 2: Rural Financial Savings

The financial flows have been estimated instrument-wise. The gross investment in financial assets and total credit taken were first derived. The difference gives the net financial savings of the households, and represents the net outflow of resources on private capital account.

The lists of financial instruments in which rural households invest and the agencies from which they take credit are principally based on *RBVs All India Debt and Investment Survey 1971-72*. An attempt has also been made to estimate rural savings in the form of currency, an instrument not covered by the AIDIS. The estimation details of the various financial instruments are given in this appendix.

The financial flows have been estimated separately for the rural and agricultural sectors. This has been done at the all-India level and also State-wise. The sequence of estimation was all-India, rural; all-India, agricultural; and State-wise rural and agricultural. The organisation of this appendix follows this sequence.

#### (A) All-India, rural (Appendix Table I): (A.1) Financial assets:

##### (1) Currency;

Household surveys have been unable to estimate savings in the form of currency on account of an extreme reluctance to disclose currency holdings. However, according to one NCAER report, rural savings in the form of currency form one-third of such savings for the entire household sector (See NCAER, 1965, p 84). We have used this ratio for the entire period. Currency savings for the entire household sector have been taken from RBI's *Reports on Currency and Finance*.

##### (2) Life insurance premium:

The annual reports of the Life Insurance Corporation give a break-up of the rural and urban new business. The new business refers to the sum of new assurances. The share of rural business in the total was around 30 per cent in the 1960s and 25 per cent in the 1970s. These proportions have been applied to aggregate household savings in life insurance premia, as reported in the RBI's *Reports on Currency and Finance*.

##### (3) Provident fund contributions, units etc.

Savings in the form of provident fund

contributions, units, annuity deposits and deposits in non-banking companies were estimated as follows: the ratio of financial assets in these forms to financial assets in the form of life insurance was obtained from the AIDIS, 1971-72. The ratio worked out to 1.90. The ratio was applied to life insurance premia, derived as indicated above, to obtain a series for provident fund etc. It may be noted that the series of provident fund, units, etc., comprises almost entirely of provident fund contribution, savings in the other forms being extremely small.

#### (4) Small savings and 'others':

RBI's *Currency and Finance* reports give the outstanding postal deposits (savings, recurring and time). The rural postal deposits for 1962 and 1971 were obtained from the AIDIS. The ratio of rural postal deposits to aggregate worked out to little less than 10 per cent for both years. A ratio of 10 per cent was applied to the series of total postal deposits to obtain the rural postal deposits.

To this derived series, a further component was added. The ratio of the sum of all other small savings besides postal deposits and 'other' financial savings to postal deposits was obtained from the AIDIS. The ratio worked out to about 2.5 in 1962 and 0.75 in 1971. The ratios for between 1962 and 1971 were obtained by interpolating, and 0.75 was used for the period thereafter.

These manipulations give the stock estimates. The flows for each year were derived by subtracting the stock of year  $t-1$  from the stock of year  $t$ .

#### (5) Commercial bank deposits:

Rural bank deposits outstanding in June 1973 and after were obtained from RBI's *Basic Statistical Returns* (BSR). For the earlier years, the average growth rate of outstanding deposits between 1973 and 1980 (20 per cent per annum) was assumed and a series of outstanding rural deposits between 1961 and 1973 was generated. From these outstandings, the flows were derived as indicated above.

It should be noted that the BSRs define rural areas as centres with population of 10,000 or less. The conventional census classification, and one followed by the *Debt and Investment Surveys* also, is based on multiple criteria of size, density and occupational distribution, as discussed in the main text. This classification difference causes problems of comparability to which there is no ready solution.

#### (6) Co-operative shares and deposits:

The investment of rural households in the shares and deposits of co-operative credit societies and primary marketing



societies was estimated. The credit societies included were: Primary Agricultural Societies (PACS), Central Co-operative Banks (CCBS), and Primary and Central Land Development Banks. The outstanding paid-up capital and deposits held by individuals or 'growers' were obtained from RBI's *Statistical Tables Relating to the Co-operative Movement in India*. These were taken to be financial assets held by rural households. The flows were derived from the outstandings.

(7) *Informal (or internal) financial activity:*

The financial assets considered above relate to formal financial institutions. All other financial assets/liabilities creation is here described as informal financial activity. It is assumed that such financial activity represents lending within the rural sector, i.e. whereas acquisition of the formal instruments described above leads to a resource outflow from the rural sector, informal lending leads to no net flow.

Acquisition of informal financial assets is normally grossly underreported in sample surveys. However, the debt to informal credit agencies is probably reported more accurately. Corresponding to this debt there must be financial assets. The procedure we have followed, therefore, is to take the debt reported by rural households to informal credit agencies (in the RBI's *Debt and Investment Surveys*) as a measure of informal sector financial assets. The credit agencies considered were: landlords, agricultural and professional moneylenders, traders, relatives and friends and 'others'. The debt of rural households outstanding to these agencies in 1961 and 1971 was obtained from the *Debt and Investment Surveys*. Assuming a constant compound growth rate, a series of loans outstanding was generated. From this series, the flows were obtained.

The asset flows described above are given in columns (2) to (11) of Appendix Table 1.

(A.2) *Financial liabilities:*

(1) *Commercial bank credit:*

RBI's BSRs give details on rural credit outstanding from 1973. Rural credit is here defined as credit issued by rural branches and not as credit to rural households. This distinction is, however, important. In 1979 and 1980, almost 60 per cent of agricultural direct finance to cultivators was from non-rural branches. Since such finance accrues ultimately to rural households, a measure of financial flows in the rural sector must take cognisance of it. Hence, to the outstandings of rural credit as reported by the

BSR, we added 55 per cent of direct agricultural finance (also reported by the BSR) to obtain estimates of total rural outstanding credit for the years 1973 to 1980.\*

The estimates of outstandings so obtained were projected backwards using the growth rate between 1973 and 1980 (33 per cent per annum). The flows were derived from the outstandings so estimated.

(2) *Co-operative credit:*

As in the case of shares and deposits of individuals in co-operative institutions, the credit to individuals from co-operative credit societies and primary marketing societies was considered. The list of societies included and the source were the same as those for shares and deposits (see above A.1.6). The outstandings were obtained and the rates and flows derived.

(3) *Government credit:*

Government credit flows to agriculture were obtained from RBI's *Currency and Finance Reports* and the report of the *All-India Rural Credit Review Committee*, RBI, 1969. For some years, the data were not available and the figures were filled in by the linear interpolation.

The credit flows into the rural sector and the net financial saving of the rural sector are shown in Appendix Table 1, columns (12) to (15).

(B) *All-India agricultural* (Appendix Table 2):

Agricultural households are a subset of rural households and can be either cultivators or agricultural labourers. Cultivators are defined by the RBI *Debt and Investment Surveys* as those operating more than 0.005 hectare. Only cultivators are considered in the following estimation since the financial assets and liabilities of agricultural labourers are negligible. The procedure used essentially was to apportion financial assets to agricultural households on the basis of *Debt and Investment Surveys* indicators. The liabilities were independently derived. (B.1) *Financial assets:* (1) *Currency and Commercial bank deposits.*

The RBI *Debt and Investment Surveys* show that the cultivator households held 56 per cent of the commercial bank deposits held by all rural households in 1961. The corresponding percentage in 1971 was 77. These percentages have been

\* For the same reasons, rural deposits are also underestimates. No adjustment has been made for this and hence it has to be borne in mind when interpreting the estimates.

applied to savings in the form of current and commercial bank deposits of rural households during 1961-62 and 1971-72, estimated as discussed in section A about (see Appendix Table 1, columns (2) and (8)). For the years between 1961-71 and 1971-72, linear interpolation was used to generate multiplying factors and after 1971-72 a constant 77 per cent was used

(2) *Provident fund contributions and life insurance premia:*

The *Debt and Investment Surveys* included these assets in the schedules on in 1971-72. The share of agricultural households in life insurance and provident fund held by all rural household was 61.2 per cent and 48.2 per cent respectively. These proportions were applied to the provident fund and life insurance premia series estimated for rural households (see section A above at Appendix Table 1, columns (3) and (4);

(3) *Small savings and others':*

Since the bulk of small savings are 'others' comprises post-office deposits the ratio of post-office deposits held by cultivators to those held by all rural households was used. The ratio worked out to about 73.7 per cent in both 1961 and 1971 and so was applied uniformly.

The financial savings of agriculturists described above are given in Appendix Table 2, columns (1) to (7)\*\*

(B.2) *Financial liabilities:*

Commercial bank outstandings direct finance to cultivators is available from the BSRs for the period after 1971. The growth rate of these outstandings between 1973 and 1980 (37 per cent per annum) was used to project backwards those outstandings, from which the flows were derived.

Co-operative credit to the agricultural sector was taken to be the same as to the rural sector for which the estimation procedure was described above in section (A.2.2). The co-operative credit estimated as in section (A.2.2) goes almost entirely to agriculturists. A small fraction of primary agricultural societies' loan does go for non-agricultural purpose but even this probably goes to cultivate!

Government finance to agriculture from RBI's *Currency and Finance Reports* and is the same series as used above for the rural sector.

The credit flows to agriculture are shown in Appendix Table 2, columns (1) to (11).

\*\* No attempt was made to separate estimate informal financial assets agricultural households.

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(C) *State-wise rural* (Appendix Table 4):

The Statewise financial assets and liabilities flows in 1971-72 were estimated essentially by apportioning the relevant all-India flow to the States according to their share in the financial asset or liability on June 30, 1971<sup>1</sup> as given by the *Debt and Investment Survey*. For currency, the State-wise distribution of commercial bank deposits was used and for small savings and 'others', the Statewise distribution of post-office deposits was used. The Statewise distributions for the different instruments are given in Appendix Table 3.

Only the co-operative assets and liabilities were estimated independently. The outstandings relating to the same instruments and agencies as for the all-India estimates were obtained from the *Statistical Tables Relating to the Co-operative Movement in India*. Differences between the outstandings at three year intervals were estimated and these were then divided by three to give an average annual flow during that period. This was done for three pairs of years, 1960 and 1963, 1970 and 1973, and 1976 and 1979. This gave Statewise average flows around 1961-62, 1971-72 and 1977-78.

The above flows are presented in Appendix Table 4.

(D) *State-wise-agricultural*: (Appendix Table 6)

AH agricultural flows, except for co-operative flows and government credit, were obtained by applying the ratio of the asset (or liability) held by cultivator households to that held by all rural households. These ratios are given in Appendix Table 5. The commercial bank deposits ratio was used for currency and the post office deposits data for small savings and others.

Co-operative flows and government credit used were the same as for the rural sector, as in the all-India estimation.

The above flows are presented in Appendix Table 6.

Appendix Tables 7 to 9 provide data used in the preparation of Appendix Tables 1 to 6 and also tables in the main text.

### Appendix 3: Working Capital in Agriculture

The CSO in the disaggregated statements of *National Accounts Statistics* gives the value of material inputs for different industrial sectors including agriculture. No such annual estimates of wage payments are available. A partial measure of increase in working capital may, therefore, be obtained by considering the material inputs. From the CSO,

the increases in the annual flow of inputs may be estimated. Clearly, all of this increase does not represent increase in working capital, which is a function of the time over which the inputs are tied up. In Indian agriculture, the actual production process may be assumed to take three months. However, the output is not immediately marketed. In States like Tamil Nadu and Andhra, only about 25 per cent of the marketed output is released in the first three months after the harvest. On the other hand, a large part of the output is not marketed, and this portion of the output cannot be considered as constituting working capital.

Hence, we may assume that working capital is tied up for between 4 and 6 months. The accompanying Appendix Table 10 shows the increases in working capital on account of increased use of material inputs.

### Notes

- 1 In actual practice, the rural sector is defined in a negative manner. Urban areas are those with municipalities, civil lines, cantonments, etc, and those with: (a) population size exceeding 5,000, (b) population density exceeding 400 person per square km, and (c) less than three-quarters of the workforce engaged in agriculture.
- 2 In deriving the savings rate, the aggregate savings of A households, which also engage in non-farm activity, was divided only by agricultural income. Thus the savings rate of A households is overstated. On the other hand, the estimated NAR income, which is derived as a residual, is an overestimate, and the NAR savings rate is, therefore, as underestimate.
- 3 The rural-all-India comparisons must be cautiously interpreted. The difference between the rural and all-India rates (at a point of time and in the trends) is probably exaggerated. The all-India estimates are prepared by the CSO. The available evidence suggests that the CSO's estimates of physical investment in the 'household' sector are considerably overstated. These estimates are in general based on the RBI's *Debt and Investment Survey of 1961-62* and are moved forward each year by some composite index of income, population, area sown etc. The extern of increase in investment shown by this method is not borne out by the 1971-72 *Survey* (See Rao and Rao, 1982). There is no reason to consider one *Survey* superior to the other. As discussed in Appendix 1, the RBI considers the two *Surveys* completely comparable. Thus our estimates of physical investment in agri-

culture are not strictly comparable to the CSO's household investment estimates and hence to CSO's aggregate savings and investment estimates.

- 4 The net inflow computed here is less than that computed in an earlier exercise (Mody, 1981). The difference arises because lending to agricultural households by professional moneylenders and traders, which was earlier considered an inflow into agriculture, is here not included as a net inflow.
- 5 Using the CSO investment estimates.
- 6 Our estimates and CSO estimates are not comparable.
- 7 One could blow-up agricultural income by the rural/agricultural worker ratio. But this would give misleading results since the value added per worker is higher in non-agricultural activities. Moreover, the value added per worker probably varies significantly among States.
- 8 The computation details are in Appendix 2.
- 9 Orissa and Jammu and Kashmir were also at the 60 per cent level. In these States, too, the credit inflow in the early 1970s was poor.
- 10 *India Bulletin of Food Statistics*.
- 11 The comparability of the 1961-62 and 1971-72 surveys is discussed in Appendix 1.
- 12 Our analysis above shows that the study of changes in inequality should not be confined only to studying changes in gini coefficients of consumption expenditure and asset holdings. Investment and disinvestment may not make an impression on consumption and asset stocks in a short space of time, but represent underlying forces which will determine future income streams. For further limitations of conventional inequality measures, see Kurien.
- 13 Fixed capital formation used here is to be distinguished from gross capital expenditure used above for estimating savings. Fixed capital formation does not include expenditure on repairs and maintenance and on livestock and land purchases.
- 14 The expenditure deleted was direct expenditure on 'wells' and 'other irrigation works'. This probably does not include expenditure on pumpsets, which perhaps gets covered under 'agricultural' implements and machinery'. No breakdown for the latter was, however, readily available.
- 15 The savings rates discussed here are 'gros' rates, i.e. no attempt has been made to account for depreciation. As such, the are probably not very different from the 'net' rates obtained by Krishna and Rayachaudhuri (1982). However, the methods used for estimating savings here are quite different. For limitations of the Krishna and Rayachaudhuri exercise see Mody a

at 1982.

- 16 The rate of growth in net irrigated area in the 1960s was about 2.5 per cent per annum. This rate has fallen to about 2 per cent. The fall in the rate of growth in wells irrigation has been from 6 per cent to 4 per cent.
- 17 The more recently constituted Regional Rural Banks have been net lenders to agricultural households in the late 1970s. However, the amounts involved are yet relatively small.
- 18 Though whether one views this as socially illegitimate use of credit is debatable.

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### Abbreviations

- |           |   |
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| (1) CSO   | : Central Statistical Organisation              |
| (2) NCAER | : National Council of Applied Economic Research |
| (3) RBI   | : Reserve Bank of India                         |
| (4) BSRs  | : Basic Statistical Returns                     |

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