on par with Suryapet, the liberal loans advanced by the land mortgage bank to tap the available subterranean waters is directing the investment to a great extent on assured irrigation facilities. Thus it appears from the above discussion that external factors play a crucial role in the investment pattern of the various regions.

ESTIMATES OF PRIVATE CAPITAL EXPENDITURE IN AGRICULTURE DURING THE PERIOD 1969-70 TO 1973-74

A. P. KURIAN

Deputy Director
Division of Rural Economics
Economic Department
Reserve Bank of India, Bombay

This paper attempts to give some broad estimates of private capital expenditure in agriculture in certain specified items during the Fourth Plan period 1969-70 through 1973-74.

Capital expenditure of rural households in agriculture leading to capital formation covers a number of items like reclamation of land, bunding and other land improvements, irrigation, agricultural implements and machinery, farm houses, storage and warehouses, etc. It will be rather difficult to make projections of estimates for all the items covered under capital expenditure. However, in the context of the past trends as also of the developmental programmes envisaged during the Fourth Five-Year Plan period, the important items could be isolated and some estimates for these items may be made.

Detailed and perhaps the latest data on capital expenditure and capital formation in farm business by the rural household sector are available from the All-India Rural Debt and Investment Survey 1961-62. According to this survey, among the different items included under capital expenditure in farm business, three items, viz., land improvements covering reclamation of land, bunding and other improvements, irrigation covering wells and other irrigation resources, and agricultural implements and machinery accounted for the largest share of 87 per cent in the total expenditure of Rs. 227.2 crores; the total is exclusive of expenditure on transferable items like purchase of land and purchase of livestock. The data on capital formation in farm business by the rural households also reveal that among the different items, the above three items together accounted for 87.1 per cent of aggregate capital formation in 1961-62. During the Fourth Plan period, though a few items like storage and warehouses might emerge as important constituents in the total capital expenditure, it could be reasonably

assumed that in the overall capital expenditure of rural households, land improvements, agricultural implements and machinery and irrigation would continue to account for the largest share in view of the developmental programmes envisaged in the Plan for these items. These three items may, therefore, be isolated and some broad estimates of capital expenditure on them by the rural household sector may be attempted with reference to the physical programmes and targets envisaged.

Land improvement schemes broadly fall under three categories. The first is land development and preparation which is a general term used for land levelling, shaping, bunding and land preparation. The second is soil conservation programme and the third relates to reclamation of land covering waste land, ravine areas, saline and alkaline areas, deserts, etc. It is in respect of the first two categories that private investment will be of sizable magnitude. Though land development could be considered as a general operation, it is specially significant in the areas brought under irrigation. For proper and better utilization of irrigation, the land has to be prepared and developed involving levelling, shaping, bunding, etc. The initiation of Ayacut Development Programme in recent years reflects the importance given to the problem of land development in irrigated areas. Confining only to the area proposed to be brought under irrigation during the Fourth Plan period, a broad estimate of the magnitude of additional capital expenditure may be attempted. The targets for utilization of additional irrigation potential during the Fourth Plan period are fixed at 4.2 million hectares under major and medium irrigation and 3.2 million hectares under minor irrigation. The entire land brought under irrigation particularly under minor irrigation may not require development; the extent of area requiring land development would depend on a number of factors such as topography, slope of land and source of irrigation and as such it is bound to vary from region to region. In the case of a number of irrigation projects financed by the Agricultural Refinance Corporation, it was observed that the proportion of area requiring land development in major and medium irrigation projects varied between 60 to 80 per cent. Assuming roughly that three-fourths of the area brought under major and medium irrigation would require land development, and that one-third of the area brought under minor irrigation will alone require land development, the total area on which capital expenditure on land development will be incurred may be reckoned at 4.22 million hectares. As regards the level of expenditure it also would vary from region to region depending on the level of development required and the cost of material and labour. In the case of the projects referred to above, the land development cost varied from about Rs. 200 to Rs. 800 per hectare; the average expenditure worked out to Rs. 500 per hectare. At this rate the magnitude of expenditure on land development and preparation for the additional area proposed to be brought under irrigation during the Fourth Plan period could be estimated at Rs. 211 crores.

With regard to reclamation of land the bulk of investment expenditure generally comes from the Government sector; however, as indicated by the 1961-62 data the household sector also incurred expenditure on this item. In the absence of detailed programme and estimates of cost it is difficult to make any separate projections of capital expenditure. But on the basis of cultivators' credit requirements for this purpose indicated by the All-India Rural Credit Review Committee,
the overall magnitude of expenditure on this item may be reckoned at Rs. 50 crores.² Soil conservation is yet another land improvement programme on which private investment has so far not been very significant. But in view of the importance given to this programme, the expenditure on this item could be expected to move up sizably. Generally, the bulk of the expenditure on soil conservation programme is initially incurred by the Government and later recovered from the concerned cultivators in instalments. On the basis of the estimates indicated by the Rural Credit Review Committee, the overall expenditure may be taken at Rs. 150 crores. Thus capital expenditure on land improvement covering all the three categories will broadly be of the order of Rs. 411 crores during the Fourth Plan period (Table I).

**Table I—Estimates of Private Capital Expenditure in Specified Items 1969-70—1973-74**

<table>
<thead>
<tr>
<th>Item</th>
<th>Estimates (Rs. crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Land improvement</td>
<td></td>
</tr>
<tr>
<td>(a) Land development*</td>
<td>211</td>
</tr>
<tr>
<td>(b) Soil conservation†</td>
<td>150</td>
</tr>
<tr>
<td>(c) Land reclamation†</td>
<td>50</td>
</tr>
<tr>
<td>II. Agricultural implements and machinery†</td>
<td>709</td>
</tr>
<tr>
<td>III. Minor irrigations@</td>
<td>1,049</td>
</tr>
<tr>
<td>(a) Sinking of wells</td>
<td>300</td>
</tr>
<tr>
<td>(b) Boring of wells</td>
<td>50</td>
</tr>
<tr>
<td>(c) Deepening of wells</td>
<td>24</td>
</tr>
<tr>
<td>(d) Diesel pump set</td>
<td>210</td>
</tr>
<tr>
<td>(e) Electric pump set</td>
<td>225</td>
</tr>
<tr>
<td>(f) Private tube-wells</td>
<td>240</td>
</tr>
<tr>
<td>Total (I + II + III)</td>
<td>2,169</td>
</tr>
</tbody>
</table>

* Worked out on the basis of additional area proposed to be brought under irrigation and average cost of land development.
† On the basis indicated by the Report of the All-India Rural Credit Review Committee, *op. cit.*
‡ Derived from credit estimates as given by the Working Group of Fourth Plan for Agricultural Implements and Machinery, *op. cit.*
@ Report of the Working Group for the Formulation of Fourth Plan Proposals on Minor Irrigation and Rural Electrification, *op. cit.*

Investment on minor irrigation works covering sinking, boring and deepening of wells, installation of diesel and electric pump sets and private tube-wells, has been on the uptrend in the last few years and in the context of the greater emphasis laid on minor irrigation in the overall agricultural programme during the Fourth Plan period, the capital expenditure could be expected to be stepped up sizably. On the basis of the physical programme and targets envisaged by the Working Group,³ the capital expenditure on private irrigation works could be estimated. The Group has worked out detailed estimates of expenditure on each item of work on the basis of targets and average cost and the overall capital expenditure is estimated at Rs. 1,049 crores during the Fourth Plan period as shown in Table I.

² The overall expenditure is derived from the requirement of credit which is reckoned at 50 per cent of the total finance required for land reclamation. *Vide* Report of the All-India Rural Credit Review Committee, Volume I, Reserve Bank of India, July, 1969, p. 124-130 (mimeo.).
³ *Vide* Report of the Working Group for the Formulation of the Fourth Plan proposals on Minor Irrigation and Rural Electrification, Ministry of Food and Agriculture, Government of India (mimeo.).
The next important item on which capital expenditure would show sizable increase is in respect of purchase of agricultural implements and machinery. Mechanized farming has increased in popularity and received greater emphasis in policy. The demand for various agricultural machinery and implements is estimated to show sizable increase. For instance, the annual demand for tractors is estimated to increase steadily from 70,000 in 1969-70 to 90,000 in 1973-74. The Working Group on Agricultural Implements and Machinery for the Fourth Plan has made projections of demand for various implements and has also estimated the credit requirements for these implements. On these bases, the overall capital expenditure for purchase of agricultural implements and machinery during the Fourth Plan period could be estimated at Rs. 709 crores. 4

In sum, capital expenditure of rural households in the three major items—land improvement, agricultural implements and machinery and minor irrigation—would thus add up to Rs. 2,169 crores during the five years 1969-70 through 1973-74 as indicated in Table I, the annual expenditure would be varying depending on the annual physical programme. The basic assumption in these estimates is that the programme envisaged during the Fourth Plan period would be implemented. At this stage it may be reiterated that these estimates, subject as they are to various limitations, are in the nature of “order of magnitude” figures.

LEVEL AND PATTERN OF INVESTMENT IN AGRICULTURE:
A MICRO CROSS-SECTION ANALYSIS OF A PROGRESSIVE
AND A BACKWARD AREA IN CENTRAL GUJARAT

B. M. Desai*

Research Associate
Indian Institute of Management, Ahmedabad

OBJECTIVES

The paper seeks to answer the following three objectives at the farm level: (1) to determine the level and pattern of investment; (2) to examine the factors influencing the same; and (3) to examine the sources of financing investment.

However, before examining these objectives, the sample design adopted for the selection of areas and farmers and the concepts and methodology used in this paper may be stated.

---

4. The Working Group has worked out the credit requirement at Rs. 496 crores for the Fourth Plan period and assuming that the proportion of credit to total expenditure is 70 per cent, the overall expenditure could be derived at Rs. 709 crores. See Report of the Working Group for Formulation of Fourth Five-Year Plan Proposals on Agricultural Machinery and Implements, Ministry of Food and Agriculture, Government of India (mimeo.).

* The author is grateful to Dr. D. K. Desai, Indian Institute of Management, Ahmedabad and to Shri M. D. Desai, Agro-Economic Research Centre, Vallabh Vidyanagar, for their valuable suggestions. The help of Shri S. N. Chokshi in calculations is thankfully acknowledged.