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AN ANALYSIS OF OVERDUES OF PRIMARY AGRICULTURAL CO-OPERATIVE SOCIETIES: A CASE STUDY OF MAHI-KADANA PROJECT IN GUJARAT STATE

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The objective of this paper is to undertake an analysis of overdues of primary agricultural co-operative societies in an area falling under the command¹ of Mahi-Kadana irrigation project in Gujarat with a view to find out their determinants and suggest corrective steps. The choice of the area for the study has been influenced by certain special considerations. First, relatively assured irrigation facility holds the key for ushering in profitable agriculture based upon extensive introduction of high-yielding varieties (HYVs) of crops. Second, while irrigation would determine the 'potential' gains arising out of improved varieties, the 'realised' gains do actually depend upon the availability of critical inputs such as quality seeds, fertilizers and pesticides, and the ability of the cultivators with the irrigated holdings to buy these inputs. The ability to purchase these inputs in turn is determined by the availability of short-term credit facilities.² But if the primary agricultural societies, which disburse short-term credit, have high overdues recoverable from their members and in turn owe similar overdues to district central financing agency, the borrowing capacity of the societies is seriously impaired and consequently the flow of credit is adversely affected.

The paper is divided into four sections. The first section offers a brief review of short term credit facilities obtained in the Mahi-Kadana command area. The second section outlines the methodology adopted for the quantitative analysis of overdues of the primary agricultural credit societies whereas the third section presents the results of empirical study. Summary of the discussion and conclusions emerging from the analysis are given in the fourth section.

SHORT-TERM CREDIT FACILITIES IN COMMAND AREA

The cultural command area under the Mahi-Kadana irrigation project covers 0.273 million hectares in seven talukas of Kheda district on the right bank (Anand, Petlad, Borsad, Cambay, Matar, Thasra, Nadiad) and two

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1. The command area would approximately refer to irrigation potential under the project. However, there are some variations of the terms which are defined as follows: Gross command area would refer to the geographical area falling under the irrigation project while culturable command area refers to the net area available for cultivation after deducting land under forestry, non-agricultural use such as housing, village site, and pasture land meant for grazing cattle and the like. The irrigable command area would refer to the area out of the culturable command area which would actually receive water through the network of water-courses inclusive of field channels.

2. Bandhudas Sen: The Green Revolution in India: A Perspective, Wiley Eastern Pvt. Ltd., New Delhi, 1974, pp. 32-33.

talukas of Panchmahals district on the left bank (Lunawada and Santrampur). All the villages in the four talukas of Anand, Petlad, Borsad and Cambay fall within the command area. Less than hundred per cent of the villages in the remaining talukas is covered by the command area.

The distribution system consisting of canal and distributories is yet to be completed in the left bank of the project. But a large part of the area in the right bank (0.260 million hectares) has been receiving water from the distributories for quite some time due to the completion of the Phase I of the project, namely, the construction of a weir on the Mahi river at Wanakbori in Kheda district in 1958. However, the construction of field channels for taking water to individual farmers' fields, though relatively complete in the upper reaches, is still going on in the tail areas, namely, in the south-western parts, Matar and Cambay talukas. Comparatively speaking, therefore, the right bank is far ahead in the matter of flow irrigation facilities. Hence, it is considered more appropriate to restrict our study to the command area on the right bank of the project.

The area under the study is one of the most progressive spots in the State both in terms of agricultural practices and of co-operative ventures such as milk processing. Among the seven talukas, Anand, Petlad, Borsad and parts of Nadiad and parts of Cambay have the most fertile land of the area, namely, sandy loam to sandy and have the popular name 'Charotar'. The soil of other parts of Nadiad taluka and Thasra taluka is of medium black type whereas the soil of parts of Matar taluka is black type known as *kyari* land, suitable for paddy cultivation. The remaining parts of Cambay and Matar are known as *bhal* which is poorly drained and less fertile. They can be divided into coastal saline or inland saline areas. These areas badly need drainage facilities for taking full advantage of flow irrigation.

Bajra, paddy, *kodra* (inferior millet), groundnut and pulses are the important *kharif* crops of the area. Tobacco is grown extensively in the area, especially in the 'Charotar' region, as *kharif-cum-rabi* crops accounting for 40 per cent of the cropped area in the *kharif* season. Cotton is the next leading cash crop which is also processed in the area. The exclusive *rabi* season crops are wheat and potato. In the summer season, summer bajra and fodder jowar are grown. In Petlad taluka, sugarcane is increasingly grown under the assured conditions of surface irrigation and a co-operative sugar factory is functioning to process the sugarcane.

There are 488 primary agricultural societies in the right bank of the command area covering 496 villages. This means that almost each village has a society to cater to the short-term credit needs of agriculturists. About 76 per cent of the cultivators in this area are enrolled as members of co-operative societies. The average number of members for each of these societies is about 215, out of which 42 per cent is the active borrowing membership.

Short-term loans per hectare and per member have been on the increase during the recent twelve-year period. They have gone up from Rs. 215 in 1965-66 to Rs. 525 in 1976-77 and Rs. 41 in 1965-66 to Rs. 251 in 1976-77 respectively. This is not surprising since the cultivators in this

area are well-known for their progressive farming practices. Further, the area is receiving specific attention under the HYVs and intensive farming programme in Kheda district.³

The impressive picture of credit financing in the right bank of the Mahi-Kadana command area is marred by the rising overdues of the primary agricultural credit societies to the District Central Co-operative Bank. Out of 488 societies, 137 have been classified as 'C' and 'D' as on June 30, 1976 and the classification is chiefly due to their position of overdues.⁴

A review of overdues position of the primary societies over a five-year period would show that the outstanding and overdues in 1971-72 were Rs. 22.97 million and Rs. 2.77 million respectively. The corresponding figures in 1975-76 were Rs. 76.65 million and Rs. 8.93 million respectively. The picture for the State as a whole is far more alarming. The total outstandings and overdues were Rs. 1063.98 million and Rs. 265.86 million respectively in 1971-72 and were Rs. 2104.23 million and Rs. 780 million respectively in 1975-76. Expressed as a percentage of total outstandings, overdues for the State as a whole for the right bank of the Mahi-Kadana project formed 37.1 per cent and 11.7 per cent respectively in 1975-76. But considering the fact that irrigated agriculture relatively ensures the repaying capacity of agriculturists to a far greater extent, the proportion of overdues to the total outstanding in an irrigated area should, therefore, be much less.

The problem is serious since overdues adversely affect the capacity of borrowing on the part of the co-operatives from the central financing agencies and consequently reduce their loan facilities to cultivators. An understanding of their causes with a view to provide solutions is needed, especially when the realisation of the objective of increase in production depends so much on the availability of credit facilities to the cultivators for obtaining the much needed inputs.

The next section analyses the underlying causes and attempts to build a stochastic model for the purpose of quantitative analysis.

A MODEL

Overdues of primary agricultural credit societies are influenced by certain factors, which have been broadly categorised into external and internal factors.⁵ The external factors are those beyond the control of the beneficiaries and the credit societies. They are, for example, the agro-climatic conditions, irrigation facilities, cropping pattern and the like. Failure of monsoon, untimely rainfall or excess rains and such other calamities do

3. For greater details, see T. K. Jayaraman, "An Assessment of Credit Facilities in Mahi-Kadana Command Area", *Vishleshana* (Journal of Economics Department, Gujarat University), Vol. III, No. 4, December 1976, pp. 319-330.

4. Classification is done by the Audit Wing of the Co-operative Department of the State Government on the basis of performance by the society on different fronts including recovery of dues. If the instalment of dues meant for the current year does not get paid before the end of the year, it gets carried over into the succeeding year and is treated as overdues, provided no extension is given. 'C' and 'D' are the two lowest in the scale of audit classification.

5. Reserve Bank of India: Report of the Study Team on Overdues of the Co-operative Credit Institutions, Agricultural Credit Department, Bombay, 1974, Chapter II, pp. 25-71.

adversely affect agriculture and reduce the capacity of the cultivator-members to repay their dues. Similarly, lack of irrigation facilities results in less return from cultivation as compared to returns owing to the presence of such facilities consequently affecting their repaying capacity.

Some factors falling under the description of cropping pattern unique to a given area are also relevant. They are the proportion of area under cash crops to gross area under cultivation, and the intensity of cropping. It is generally observed that a cultivator raising cash crops in his field is placed in a more favourable position to pay his dues to the credit society than one who does not raise such cash crops. Further, a cultivator who exploits his land much more than one who does not do so is likely to have a larger cash turnover so as to pay up the instalments without incurring overdues.

The internal factors are those well within the control of the credit societies themselves. They are internal resources, organization structure and supervisory arrangements over recoveries. Internal resources are defined as share capital, membership fees, reserve funds and deposits from members. If the internal resources form a large part of the total working capital of the society, the latter is in a position to meet its overdues to the district central financing agency by diverting the internal resources from other uses. Though the purpose of further borrowing without obstruction would thus be facilitated, the opportunity cost of internal resources in alternative uses is high. Being aware of this, the society may recover the overdues from its members to a greater extent than a society whose internal resources form a smaller proportion of the total working capital.

Experience has been that if a credit society has a full time paid secretary and if the society is subject to frequent supervision by the District Central Co-operative Bank, the overdues of such a society are likely to be far less than those of a credit society being without a full time paid secretary and not subject to any supervision. Further, if the credit facility extended by a society has been more in kind such as fertilizers and seed, there is a greater possibility of its being used directly as input in agriculture increasing the capacity of the cultivator to repay the instalments to the society. In a similar way, if there is any provision for the cultivator to repay at least some part of the loan through co-operative marketing society, by offering his produce, the chances of the recovery of the loan are ensured to a substantial extent.

The causes seemingly responsible for overdues as discussed above can be incorporated in a stochastic model in order to test their validity in a given situation. A functional relationship is formulated as below:

$$Y = f(X_1, X_2, X_3, X_4)$$

where,

Y = overdues of the primary agricultural co-operative society in rupees.

X_1 = the proportion of net irrigated area to the total net cultivated area covered by the society expressed in percentage.

- X_2 = the proportion of gross area under cash crops to the gross cultivated area covered by the society expressed in percentage.
- X_3 = the proportion of gross cultivated area to the net cultivated area covered by the society expressed in percentage.
- X_4 = the proportion of internal resources to working capital of the society in rupees.

In addition to the above four independent variables, dummy variables can be added to the regression equation sought to be fitted for the estimation purpose. They are:

D_1 = If the society disburses loan in kind and has facilities for selling fertilizers and other inputs, this will assume the value of unity and, if not, zero.

D_2 = If the society has a full time secretary, this will assume the value of unity and, if not, zero.

D_3 = If the society has been subject to supervision consistently, this will assume the value of unity and, if not, zero.

D_4 = If the repayment of loan is linked with marketing, this will assume the value of unity and, if not, zero.

A cross-sectional multiple regression analysis of overdues of primary agricultural co-operative societies incorporating the above explanatory variables has to be done on certain assumptions. They are:

(i) In addition to the variables explained, there may be some extraneous reasons as well. For example, overdues may be caused by wilful defaulters. Since it is not possible to capture the influence of such forces, it is assumed that there is no or negligible degree of inter-society difference in their operation.

(ii) It is assumed that there is no or negligible degree of inter-society difference in the managerial skill of the secretaries wherever such secretaries are working.

(iii) The next assumption is in regard to the quality of supervision over societies where such supervision is exercised. It is assumed that there is no or negligible degree of inter-society differences in the quality of supervision.

And (iv) it is assumed that the inter-society soil-quality differences of land are also captured by the variable, cropping intensity, just as it reflects the application and hard work of the cultivator.

Under the above restrictive assumptions, the following hypotheses are sought to be tested:

(a) There is negative relationship between overdues of a co-operative society and irrigation facilities obtained in the area covered by the

$$\text{society } \left(\frac{\partial y}{\partial x_1} < 0 \right).$$

(b) The relationship between the overdues of the society and the proportion of area under cash crops to the area under total agricultural

$$\text{production raised in the area of the society is inverse } \left(\frac{\partial y}{\partial x_2} < 0 \right)$$

- (c) Cropping intensity has a negative influence on overdues position of the society $\left(\frac{\partial y}{\partial x_3} < 0 \right)$.
- (d) Overdues of the society are in inverse relationship with the proportion of internal resources to the total working capital of the society $\left(\frac{\partial y}{\partial x_4} < 0 \right)$.
- (e) Secretarial assistance to a society reduces the incidence of overdues of the society $\left(\frac{\partial y}{\partial D_1} < 0 \right)$.
- (f) Effective supervision over a society and the overdues of the society so supervised move in opposite direction $\left(\frac{\partial y}{\partial D_2} < 0 \right)$.
- (g) Linking credit with marketing and overdues of the society are inversely related $\left(\frac{\partial y}{\partial D_3} < 0 \right)$.
- And (h) distribution of loan in kind has a negative influence on overdues position $\left(\frac{\partial y}{\partial D_4} < 0 \right)$.

The next section deals with the empirical application of the model to the overdues in the right bank of Mahi-Kadana command area and reports the results of the regression analysis.

RESULTS OF EMPIRICAL ANALYSIS

The command area in the right bank under the Mahi-Kadana irrigation project presently displays wide variations in the created irrigation potential among villages covered by the primary co-operative societies since field channel construction work is pending at different stages. For this reason, the proportion of net area irrigated to the net area cultivated varies considerably among the area covered by the primary co-operative societies.

As regards the proportion of cash crops to total production, Kheda district is well-known for dominance of tobacco and cotton production among both non-cereal and aggregate agricultural production. However, tobacco and cotton are grown largely in the 'Charotar' tract of the district. In the coastal and saline tracts, popularly known as *bhal* areas of Cambay and Matar talukas, only cereals are grown, namely, paddy during the *kharif* season and unirrigated wheat during the *rabi* reason.

In the case of inland saline areas such as Limbasi village of Matar taluka and Pariej and Kaneval tank areas, land is not cultivated more than once during the year. The crop taken is only paddy during the *kharif* season and during the rest of the year, the land is kept fallow. In the 'Charotar' areas,

where tobacco is grown during July-March, a summer crop is also taken such as bajra or green fodder. In the north-eastern side of the right bank, such as Thasra taluka, paddy during the *kharif*, wheat during the *rabi*, and bajra during summer are grown. Thus, the intensity of cropping in these parts is greater than that of the saline tracts.

The internal resources of a primary co-operative society, which are taken as one of the independent variables, reflect the size of the society. For our purpose, it is defined as share capital, membership fees, reserve funds and deposits from members.

Primary agricultural societies in the right bank of the command area uniformly follow a pattern of disbursement of credit. They distribute 60 per cent of the short-term credit in kind and the other 40 per cent in cash. But there is no arrangement for the linking of credit with marketing. Though some producers dispose of their produce to the sale and purchase unions at the taluka headquarters, there is no adjustment of the receipts against their credit dues.

It was observed that only some societies do have the facilities of a full time paid secretary. Similarly, there is some variation among societies in regard to supervision over their working. Supervision is exercised by a committee headed by the Chairman of the District Central Co-operative Bank with District Registrar of Co-operative Societies as Secretary to the committee. Bank Inspectors, who are employees of the Bank, are assigned the task of inspecting the accounts of the societies and guiding them in the matter of recovery of dues. Each inspector is given on an average twenty societies for inspection, and he is expected to inspect a given society three times a year and to draw an inspection memo on a prescribed form on each inspection.

Thus, the general model developed in the earlier section is applied with modification only in regard to dummy variables. Two dummy variables, namely, the one relating to full time secretary (D_1) and the other relating to inspection (D_2) are retained, dropping the other two. Regular inspection is defined as five inspections out of six obligatory inspections in the two-year period just preceding the year of study. If the number of inspections is less than five, it is considered for the purpose that the society is not subject to regular inspection and the dummy variable (D_2) assumes the value of zero.

Though there were 137 societies classified as 'C' and 'D' societies, full information was available only for 86 societies which were subjected to the cross-sectional multiple regression analysis. Two specific functional forms, linear and double log linear, were chosen. While estimating the equations, a stochastic error term was added.

Of the two forms, double log linear form of functional relationship emerged as a better fit. The estimated equation is as follows:

$$\begin{aligned} \text{Log } Y = & 5.727 - 0.019 \log X_1 - 0.087 \log X_2 - 0.159 \log X_3 \\ & (0.27) \quad (-5.04) \quad \quad \quad (-0.63) \quad \quad \quad (-0.29) \\ & - 0.899 \log X_4 - 0.099D_1 - 0.008D_2 \\ & (-5.14) \quad \quad \quad (-0.37) \quad \quad \quad (-0.06) \end{aligned}$$

(Figures in parentheses denote computed 't' values.)

Number of observations:	86.	Adjusted R^2	= 0.2023.
Degrees of freedom:	79	F_{79}^6	= 4.60

Though all the estimated coefficients of the explanatory variables have the theoretically expected signs, only two of them are found to be statistically significant at 0.05 level. Regression analysis confirms the hypothesis that the irrigation facilities in the area covered by the co-operative society do have a negative influence on its overdues to the bank. Though the estimated coefficients of the variables relating to the ratio of area under cash crops to the total area under cultivation and cropping intensity have the expected negative signs, they are not significantly different from zero. But the estimated coefficient of the variable ratio of internal resources to the total working capital, apart from having the expected sign in conformity with the hypothesis, is significant. Thus it is statistically held that the society having a larger proportion of internal resources to its total working capital tends to have smaller overdues.

In regard to dummy variables, the estimated coefficients, though having negative signs, are not significantly different from zero. It is thus proved that the inter-society differences in secretarial assistance and supervision over recoveries do not have any significant impact on overdues of the societies.

Thus statistically significant determinants of overdues of co-operative societies in the Mahi-Kadana command area are irrigation facilities and the proportion of internal resources to the total working capital, while the other explanatory variables, namely, cropping intensity, cash crops, full time paid secretary and supervision do not seem to have any significant role.

SUMMARY AND CONCLUSIONS

This paper focused attention on an analysis of overdues of primary agricultural co-operatives in the command area of the Mahi-Kadana irrigation project in Kheda district, one of the front-ranking districts in co-operative movement in the State of Gujarat.

Overdues of primary agricultural co-operative societies have been observed to be influenced by certain factors broadly classified into external and internal factors. As far as quantification is possible, some of these factors were incorporated in a stochastic model to find out the determinants of overdues of 86 primary societies out of a total number of 137 societies classified as 'C' and 'D' under the audit procedure.

Among the six independent explanatory variables chosen, three of them represent factors external to the co-operative societies. They are: the ratio of net irrigated area to the net cultivated area indicating irrigation facilities, the ratio of area under cash crops to the area under all crops, reflecting the influence of cash crops and the ratio of gross cultivated area to the net cultivated area representing the skill and application of the farmers. Three other variables are internal to the co-operative societies, namely, ratio of internal re-

sources to working capital, and full time secretary and supervision on the affairs of the societies.

A cross-sectional multiple regression analysis of overdues of co-operative societies for 1975-76 under certain restrictive assumptions reveals that among the external factors only irrigation facility is a significant determinant at 95 per cent confidence level. Both the ratio of area under cash crops to the total area under cultivation, and cropping intensity as explanatory variables have no significant role.

Among the internal factors, internal resources as a size variable has a significant influence on variations of overdues of the co-operative society. But, the other two variables representing secretarial assistance and supervision do not have any significant impact on overdues.

It is apparent that irrigation facility enables the cultivator to augment his gross earnings from his land and consequently increases his capacity to repay his debt instalment and interest charges to his credit institutions. The study no doubt confirms the commonly held hypothesis. But what is striking is that such a result has been obtained in a study pertaining to a command area of an irrigation project. The cross-sectional study relates to variation in such irrigation facilities among areas covered by different societies. Such variations are present because irrigation supply system in the command area is yet to be fully developed. Though the canal construction work on the right bank is nearly over, the construction of field channels is yet to be completed especially in the inland and coastal saline areas in the south-western part of the command area. This particular area also demands special attention since those areas require field drains to be provided along with flow irrigation. Presently main drains, laterals and sub-laterals are being constructed; once these are ready, the construction of field channels and field drains will be taken up.

In other parts of the command area where drainage is not a serious problem and where field channels have already been constructed, there is still scope for improving the irrigation facilities. Additional land can be irrigated either by lift irrigation or by conjunctive use of groundwater. Presently some lands though located within the cultivable command area are not receiving water since they are on a higher level and field channels cannot assuredly take water to them. Lift irrigation is one of the means by which they can be irrigated. From the distributories water can be lifted and be stored in the neighbourhood of the high level lands from which the cultivators could either manually or mechanically lift water and irrigate their fields.

Further, canal distribution system has generally brought up the ground-water table in the command area. The possibilities of tapping water with less effort have, therefore, enormously increased. Moreover, where the water table has risen rather alarmingly with the possibility of water-logging, tube-wells are necessary to pump out the water to avoid damage to fields. Such wells can also irrigate lands within the gross command area presently kept out of flow irrigation due to their higher elevation.

Thus, there is scope for improving the present irrigation facilities even within the gross command area and augmenting the irrigable command area.

In that case, the proportion of net land irrigated to the total net cultivated area under each co-operative society may go up. Consequently, there will be a favourable impact on the overdues position of the co-operative societies.

As borne out by the study, larger-sized co-operatives with substantial internal resources are able to reduce their overdues with the district central bank. They also have the wherewithal to deal with the overdues by adopting improved management techniques.

Though the above results and policy implications are unique in that they are valid only in regard to a select area, the results can be applied more universally. Increasing the capacity of the cultivator-members of the co-operatives to repay their liabilities is the key to reduce the overdues position of the co-operatives. Efforts towards improving irrigation facilities, and switching on to a more favourable cropping pattern with stress on higher income yielding crops are some important solutions to the growing problem of overdues.
