Agricultural Administration **14** (1983) 81–94

Management Strategies for Corporate Control in British Agricultural Co-operatives: Part 2*

Gordon Murray†

Central Council for Agricultural and Horticultural Co-operation,
School of Development Studies, University of East Anglia,
133 Earlham Road, Norwich NR2 3RG, Great Britain

(Received: 6 January, 1983)

SUMMARY

Part 1 of this paper attempted to indicate the major importance of financial considerations in reaching an understanding of the behaviour of agricultural co-operatives. Part 2 continues this thesis and looks specifically at the means that professional managers, supported by farmer directors, use to generate additional funds available to the co-operative business.

Particularly, the paper investigates the practices used by co-operative officials to generate funds which are independent of the sanction and control of the user members. These mechanisms are collectively termed covert accumulation. *In addition to describing the major types of covert accumulation activity, the paper suggests that this practice has profound implications for the nature of co-operative practice.*

COVERT ACCUMULATION AS A MANAGERIAL STRATEGY FOR CORPORATE SUPPORT

In the theoretical world of *laissez faire* economics, an organisation which cannot attract sufficient support from its patrons would either change or

* Part 1 of this paper appeared in Vol. 14, No. 1.
† The views expressed in this paper are the author's alone. They do not necessarily reflect the official position of the Central Council for Agricultural and Horticultural Co-operation. On 23 March 1983 the Central Council for Agricultural and Horticultural Co-operation was formally dissolved. Its responsibilities have been subsumed within a newly created, Government financed organisation—Food from Britain.

Agricultural Administration 0309-586X/83/$03·00

decline to be replaced by more appropriate and successful alternative businesses. In reality, the co-operative, in common with other businesses, is neither a passive nor a neutral organisation. The co-operative contains members and staff with interests served in varying degrees by the organisation's continued existence. The organisation's beneficiaries will attempt to find strategies that will attenuate or minimise the existing constraints on the organisation. If the farmers themselves are equivocal in their preparedness to provide funds to secure the continued growth and development of the co-operative, it is argued that the officials themselves will work towards accruing the required funds *independently* of their members' direct sanction.

This autonomy of the officials (professional managers and farmer directors of the co-operative are collectively termed 'officials'), and particularly of the managers, assumes that the members are not openly hostile to the continued existence of the co-operative. In reality, the co-operative generally faces a situation where a significant number of members are unwilling or indifferent to funding the full costs of the co-operative, and particularly the managers' expansion plans. It is in this uncertain environment that managers, with the support of at least some of the farmer directors, will attempt to find alternative channels of finance outside the direct sanction of the members.

These practices of *covert accumulation* may be split into two distinct categories:

(1) *Internal Mechanisms*—The securing of additional finance from the existing membership.
(2) *External Mechanisms*—The obtaining of additional finance through commercial transactions with parties outside the existing farmer membership.

(1) Internal Mechanisms

Internal mechanisms may be further categorised into:

Direct Reserve Accumulation.
Retention of Patronage Bonuses.
Retention of Surplus Funds.

Direct reserve accumulation

The dramatic growth of corporate reserves, as illustrated in Tables 1 and 2, is one of the most fundamental changes in the financial structure of UK agricultural co-operatives that has occurred in the post war years.

TABLE 1
Long-Term Capital of All UK Co-operatives, 1970–71 and 1980–81

	(£000s)		*Percentage*
	1970–71	*1980–81*	*increase*
Members' Share Capital	24 264	62 917	159·3
Members' Loan Capital	3 336	14 537	335·8
Reserves	10 570	71 081	572·5
Surplus (carried forward)	4 146	31 780	666·5
Total	42 316	180 315	326·1

Source: Plunkett Foundation, 1971 and 1981.[15]

The figures in Table 1 relate to all co-operatives including CSCs* where members' share capital remains of largely nominal importance in the co-operatives' balance sheets. These figures can be compared with a large regional multipurpose CAC (Table 2), which has pursued a policy of encouraging members to relate share holdings to the volume of business undertaken with the co-operative.

A discussion of the rôle of reserves must primarily be concerned with their importance of the CACs and to the more established CICs. The importance of reserves is fourfold: (a) It is the area of corporate capitalisation that has assumed the greatest prominence in the funding of CACs. It is also a major source of funds in many established, staff-centred CICs. (b) Reserves are the most rapidly growing area of corporate funding over time. (It should be noted that surpluses carried forward also are frequently used to supplement reserve funds.) (c) It is the only

TABLE 2
Long-Term Capital of a Regional Multipurpose CAC, 1970–71 to 1980–81

	(£000s)		*Percentage*
	1970–71	*1980–81*	*increase*
Members' Share Capital	1 805	4 434	145·7
Members' Loan Capital	35	747	2 034·5
Reserves	208	2 940	1 313·5
Surplus (carried forward)	0	448	—
Total	2 068	8 569	314·4

Source: Annual Accounts of Regional Multipurpose CAC.[15]

* The terms CSC, CAC and CIC refer to types of co-operative and are defined in Part I.

source of co-operative funds that can be seen as 'permanent capital' because of the absence of its direct allocation to members in the majority of co-operatives. (d) It is that area of funding which most directly illustrates the potential for conflict between corporate needs and the members' individual and collective willingness to finance their co-operatives.

Table 1 shows that over the last decade reserves have suplanted members' share capital as the largest single source of long-term co-operative funds. A 1979 study by the Plunkett Foundation[14] showed that, whilst shares and reserves in UK co-operatives were at near parity in 1978 (1:1·1), on the basis of a projection of current trends the ratio of shares to reserves would change to 1:2·5 by 1986. (I consider this projection to be an overestimate, given that the ratio in 1980–81 for all UK agricultural co-operatives was 1:1·13.) However, some CACs have already nearly reached that projected estimate (Table 3).

TABLE 3

Change in the Ratio of Share Capital to Reserves for Two Regional Multipurpose CACs, 1972 and 1978

	Ratio share capital/reserves	
	1972	*1978*
Society A	1:0·54	1:2·46
Society B	1:0·53	1:2·38

Source: Plunkett Foundation, 1979.[14]

It is the permanence and accessibility of reserve funds to the co-operatives' officials that accounts for their attractiveness, and thus increasing importance in staff-centred co-operatives. The 1974 Working Party on Investment Capital in Agricultural Co-operatives[3] noted: 'Reserves are the only true permanent capital of agricultural co-operatives since shares in a co-operative society and loans in a co-operative company must both, in due course, be repaid to the co-operative members'.

This diagnosis was confirmed in the 1960s when several CACs came under increasing pressure from their members to repay share capital during a period of poor trading performances. Although several CACs subsequently made the short-term repayment of loans, and particularly shares to members, more difficult, these sources of funds remain essentially short-term.

The importance of reserves as a resource for the fulfilment of officials' ambitions for the co-operative has meant that, despite the advice of the Central Council for Agricultural and Horticultural Co-operation,[4] the majority of co-operatives do not allocate reserves to the members based on past patronage with the co-operative. The creation and maintenance of large reserve funds is a common strategy pursued by many senior co-operative managers. Their reliance on unallocated reserves is an implicit acceptance that members cannot be relied upon to produce sufficient voluntary funds for the development of the co-operative.

These funds are still used, however, for the benefit of members. Reserve funds are employed to help finance investments in member services, e.g. produce stores, grading stations, feed mills, etc. Nevertheless, there are serious negative implications in the growth of reserves:

(a) It diminishes the importance and responsibilities of the members as the primary source of finance in a co-operative.
(b) As reserves contribute to the asset value of the co-operative there is a danger that the members' financial stake in the co-operative becomes disproportionate to their trading or patronage interests. Members may be tempted to look for a financial return on their collective investment rather than a return related directly to their use of the co-operative's services.
(c) Over time, the increase in institutionally controlled funds reduces the importance—and thus the authority—of the user members in relation to the authority of the co-operatives' officials.

It can be argued that the creation of reserve funds assumes the tacit approval of the membership who can democratically determine the financial practices of the management. Technically, this is correct; yet the reality is that few members actually attend the annual general meetings of their co-operatives and vote for or against the financial practices of the officials. More fundamentally, few farmer members are likely to have the detailed understanding of the financial options available, or the necessary detailed information to criticise effectively the decisions of the management and the board of directors.

The covert nature of reserve accumulation may, therefore, be seen in the members' unfamiliarity as to their direct control and ultimate share of these funds.

Their essentially passive acceptance of this situation has allowed the growth of reserve funds (succinctly termed 'anonymous capital' by Carpenter[1]) to continue unabated.

Retention of patronage bonuses

This example of internal covert accumulation again primarily concerns the CACs. CSC organisations rarely pay their members a year-end bonus on trade as the operational charges to the members are kept at a minimum to cover planned costs.

Patronage bonuses come from the trading surplus made by the CAC. They are most commonly paid out in proportion to each member's purchase of specific types of requisites (e.g. animal feed) over a determined period.

Officials are frequently loth to see patronage bonuses paid to the members in cash, as the sum distributed is automatically lost to the co-operative. In 1980, the chairman of a large regional CAC bemoaned, in his annual report to the members, that, of the £1·4 million paid to members in bonuses and dividends on shares over the previous two years, only £100 000 had been reinvested in the society. His co-operative was concurrently undertaking a £3 million investment programme which had resulted in a threefold increase in interest charges for the year on bank loans of £620 000. The requirement to pay bonuses in cash to members was increasingly onerous.

A common procedure in many CACs is to inform members that they have earned £x of bonuses in the past trading year. The member is informed that if the co-operative does not receive a written request for the repayment of the bonuses in cash within a certain time (usually two weeks to a month), the bonuses will automatically be accredited to the member's account in the form of additional shares and/or loans.

The dilatoriness of many farmers to answer written correspondence results in a significant proportion of surplus funds not being cashed by the individual members. This example of covert accumulation may appear petty, as the member is perhaps unlikely to let the bonus be converted to share or loan capital unless he is happy with his organisation. Yet, this means of gaining additional share capital is not unimportant. A survey of co-operative financing for the period 1971 to 1973, covering 156 UK agricultural co-operatives, showed that, of the total of £2·5 million's worth of share purchases made by members during the period, 78 % came from retained patronage bonuses.[14]

Like all other means of covert accumulation, the process is less 'painful' than the payment by the member to the co-operative of funds in his personal possession. In this example, if the accumulation is unsanctioned, it is only made so by member default.

A possibly more machiavellian use of patronage bonuses to complement internal funds was seen in the CAC investigated by Sargent and Doherty.[18] In 1967 the Society's officials decided to terminate the patronage bonus system in favour of paying a higher interest rate on members' share and loan funds. (Given the contra-capitalist logic of co-operation, this practice does not easily accord with the 'co-operative principles'.) The officials argued that the old system would increasingly be unable to generate the funds needed by the society. They further added that, 'The removal of bonus would simplify trade and accounting and would disprove the charge that the society added the bonus to the price in the initial contract'.

The co-operative officials' reasoning was strangely at variance with the opinion of the majority of their members, 85 % of whom stated (in a questionnaire survey by Sargent & Doherty) that they preferred patronage bonus to interest on shares. This preference was not surprising given the low average share capital of the membership. In a sample of 84 members, Sargent & Doherty found that 64 % of the respondents had shares to the value of £100 or less, while only 14·3 % had shareholdings of over £400.

If the policy was seen as a means of increasing the attractiveness and importance of shares as a source of co-operative funding, it failed. The termination of patronage bonuses and the increase in share interest did not stop the long-term decline in shares as a proportion of the co-operative's finances. What the policy did do was to make available considerable funds for placement to reserves that otherwise would have been distributed in large part to the members as patronage bonuses. It can be argued that a change in share interest would not materially increase the attractiveness of shares to members given their constant par value. Thus, stopping the bonus payments realised considerable amounts of money for the society with only a limited part of the increase being needed to pay additional share interest charges. The policy materially benefited the co-operative's finances (Table 4). It is rather more doubtful whether the user members were likewise advantaged by the change.

Retention of surplus funds

In some circumstances the co-operative can carry out profit-generating

TABLE 4
Changes in the Relationship of Share Capital to Reserves in a CAC in Western England, 1966 to 1975

	1966	*1967*[b]	*1968*	*1969*	*1970*	*1971*	*1972*	*1973*	*1974*	*1975*
Members' Share Capital (%)[a]	33	26	25	24	21	19	17	11	11	10
All Reserves (%)[a]	10	10	11	15	12	14	17	14	21	26

Source: Sargent and Doherty.[18]
[a] Sargent and Doherty express the figures as a percentage of the co-operative's liabilities.
[b] Year of policy change.

activities from resources supplied by the members that are difficult to subsequently distribute according to the members' past patronage. In these circumstances the co-operative's officials may elect to retain the profit in reserves for investment that will benefit the collective membership, rather than resort to an arbitrary distribution. (Any distribution by members' shareholding is discouraged in a co-operative organisation. Shares are a cost of entry. Additional shares do not give the holder preferential rights in any distribution of the co-operative's assets.)

The case in point may be illustrated with reference to an East Anglian specialist grain storage and marketing co-operative (a CIC).

Members' grain is required to be delivered for sale consistent with a set of quality requirements stipulated by the co-operative, e.g. maximum moisture levels, percentage of shrivelled and broken grains, etc. All grain deliveries from members are tested for quality by the co-operative's staff, and scale deductions are made for grain that will need drying and cleaning prior to sale. Throughout the season these deductions, which, on occasion, are greater than the costs necessary to improve the quality of the grain to the buyers' specifications, result in a credit balance being generated by the co-operative. In addition, the inferior grain physically removed (termed 'screenings') may, on occasion, be added to grain that is above the quality stipulated by the buyer, thus enabling the screenings to be sold at the same unit value as a quality grain. Screenings may also be sold direct as a low quality animal feed component. The result of these practices is a further source of revenue to the co-operative which is not directly apportioned to any one member.

In recent years the revenue from the sale of screenings has been retained by the co-operative and put towards the cost of additional storage investment. (Approximately 70% of the co-operative's 180 members are involved in the financing and use of the co-operative's 32 000 tonnes of central grain storage.) While some members would prefer the money to be distributed to the membership, it is not always easy for individual members to determine the sum of monies at issue. In the past, the management, supported by the directors, have decided to retain these surplus and, to an extent, opportunist funds. It was estimated that, over a two-season period (1977–78) the revenue generated by the sale of screenings was approximately £90 000.

Whilst the retention of these funds is a legitimate practice, the board and management, by this action, have pre-empted the members' right of decision on the allocation of part of the co-operative's surplus. Although the decision taken may be in the long-term interests of the members, it was in conflict with their short-term wishes. However, in this particular co-operative the members' wishes have ultimately prevailed. Because of the unpopularity of this action the co-operative officials decided that, from the 1979 harvest, the monies obtained from the sale of screenings would be distributed to the membership pro rata to the members' use of the central storage and conditioning facilities.

The decision to change the practice also supports the observation that this CIC remains a director-centred organisation, as the professional staff were the main advocates of the earlier policy.

(2) External Mechanisms

Profit centres through co-operative-related companies

If the co-operative officials wish to accrue additional funds, the limitation of their activities within the co-operative's present membership may be seen as an unnecessary curtailment of the potential for further accumulation. The officials may also wish to diversify the co-operative's trading operations into new areas of interest ancillary to those for which the co-operative was originally created.

The formation of subsidiary, service and other co-operative-related companies is an institutional means by which the officials may organise this additional trade and subsequent revenue. (It should be remembered that co-operative-related companies are not themselves constituted as co-operatives. A co-operative, by definition, cannot own or control another co-operative.)

Initial survey enquiries by the CCAHC showed that UK co-operatives in 1979 had approximately one hundred subsidiaries plus an additional fourteen service companies. It is likely that a full survey would reveal the existence of rather larger numbers of each organisational type. A recent American report by Kraenzle & Volkin[7] illustrates the popularity of co-operative related companies. In 1975 and 1976, fifteen of the twenty-five largest US agricultural co-operatives had one or more subsidiaries, with a further two co-operatives having ten or more subsidiaries. In their report the authors surveyed eight large co-operatives with a total of 195 subsidiaries. (One of the co-operatives studied had 138 subsidiary retail shops.)

The definitions of what constitute co-operative-related companies are complex and not without a certain lack of clarity. For present purposes, the term 'co-operative related company' is used to include subsidiary and service companies in addition to joint venture enterprises between co-operatives and private firms. Affiliate companies and federal organisations may also be classed as co-operative-related companies. However, their potential as a means of covert accumulation is generally very limited.

Advantages of co-operative-related companies

The formation of co-operative-related companies presents a number of advantages to the parent co-operative. (The American report lists 13 in total.) In the present context seven major reasons for forming co-operative-related companies are pertinent:

(i) The creation of a source of revenue outside the parent co-operative's existing member-related activities.
(ii) Increasing the co-operative's trading volume without a concommitant increase in membership numbers or patronage.
(iii) Diversification into new activities outside the current interests of the co-operative and its membership.
(iv) The establishment of joint ventures with co-operative or capitalist partners.
(v) Protection of tax advantages.
(iv) The reduction of trading risk to the parent co-operative.
(vii) To serve as a vehicle for member recruitment.

Co-operative legislation in the UK limits the amount of trade a co-operative may undertake with non-members to approximately one-third of its total business. It is in the alleviation of this constraint (as well as the protection of certain tax advantages to co-operatives) that the co-operative-related companies become an important institutional device. By creating a service company, which, in turn, becomes a member of the parent co-operative the service company can be used to trade with non-members as a principal. Profits made by the service company are channelled into the parent co-operative by the imposition of management charges sufficient to abstract the profits made.

This device is of considerable benefit to the co-operative. It enables a marketing co-operative to supplement limitations in the quality or quantity of its members' produce by extending its procurement to non-members. One very successful East Anglian potato and vegetable co-operative has accorded its service company a central place in its development strategy. The service company, which is controlled in practice by the co-operative's managers, is used to undertake entrepreneurial action in activities outside the immediate interests of its producer members. Above all, the service company has become a highly profitable merchanting business allowing the officials a source of development income independent of the members. In 1980, the service company's sales represented some 20% of the co-operative's total business and earned a net income of £58 000. This extraneous profit centre has helped contribute to a twenty-fold growth in the co-operative's fixed assets over the succeeding twelve years.

A subsidiary company owned by the co-operative may have a similar logic of profit creation. The importance of a subsidiary company is highlighted in a period where the parent co-operative is experiencing adverse trading conditions. One CAC, in 1980, whilst increasing its sales turnover from £13·3 million to £15·8 million, registered a decline in profits from the previous year of 16·7% to a total profit of £244 309. The full effects of this reversal in its trade with members in requisite and produce marketing was ameliorated, however, by a 27% increase in the profitability of subsidiary companies involved in fuel oil distribution, frozen food sales and agricultural contracting.

In addition to direct profit considerations, the use of subsidiary companies allows the co-operative, particularly CACs, to diversify its activities whilst retaining corporate control. If the additional activities were embraced within a new co-operative the parent co-operative can only legally hold a maximum of 10% of the voting shares. Corporate control would be lost. In addition, the parent co-operative can only benefit from the new co-operative to the extent that it uses its services and/or supplies interest-bearing share or loan capital to the new co-operative. To those corporate-centred officials, who are anxious to expand their co-operative and to gain the full profit from new ventures, a subsidiary company frequently appears a more suitable means of extending the perpetuating their influence.

An indication of the importance with which the institutional strategy of creating co-operative-related companies is held can be evidenced from the popularity of these satellite organisations in the co-operatives investigated. In the East Anglian research area, nine of the twelve co-operatives contacted had one or more service or subsidiary companies (a total of 23 co-operative related companies). Whilst co-operatives in each of the CAC, CIC and CEC categories had formed these companies, this facility is most appropriate to those co-operatives with diverse and growing trading interests and a consequently high requirement for development capital. Thus, it is the staff-centred, capital accumulative, multi-purpose societies that are most likely to see the potential of this strategy for profit accumulation.

An examination, in 1980, of seven of the largest regional CACs in the UK showed that, on average, each of the societies owned over six co-operative-related companies apiece. (A total of 44 for the seven CACs with a range of four to seven subsidiaries/service companies per co-operative.)

The proliferation of co-operative-related companies in UK agricultural co-operatives, like other aspects of covert accumulation, is not without negative consequence. Observers in both the USA and UK have noted the difficulty of obtaining explicit information on the financial importance of these organisations to their parent co-operatives. The tendency for the service and subsidiary companies to be controlled by professional staff also raises the question of the accountability of these organisations to the co-operatives' members who, in the final analysis, bear the financial consequences of their success or failure. Whilst nominally controlled by the farmer members, there exist, at least potentially, the seeds of conflict between the co-operative-related company as controlled by management and the interests of the members as articulated through the actions of the co-operative.

Finally, there is a certain irony in the co-operative business having to have recourse to a capitalist mode of operation through the service or subsidiary company in order to further its success as a co-operative. The increasing dependence of the co-operative firm on sources of capitalist profit may be necessary to overcome the practical difficulties associated with co-operative action. However, these activities could serve to undermine confidence in the co-operative's effectiveness as a commercial organisation. Organisations pursuing this hybrid course may be in danger of deteriorating over time into a form of *degenerate co-operation*.

CONCLUSIONS

The use of a conflict model and the attendant differentiation of the co-operative into a number of discreet interest sets allows the tensions between members and their professional management to be more clearly explored. The use made of financial criteria to develop this analysis is essentially functional. Nonetheless, it is believed that the competing pressures for finance fundamentally determine the structure and behaviour of contemporary agricultural co-operatives.

The importance of management strategies for corporate support serves to illustrate that the co-operative organisation embraces interests wider than that of the member alone. Unlike the frequent ambivalence of the member users, the professional employee's support of the co-operative is more absolute. His custodial actions protecting the co-operative are a rational defence of his full-time employment.

It is in the development of covert accumulation, i.e. funding independent of members' sanctions and control, that the peculiar interests of the managers are in danger of undermining the logic and practice of co-operative action. Irrespective of the sometimes considerable influence of these practices on the finances of the co-operative, these stratagems remain questionable. Covert accumulation can directly prejudice the authority and control of the members and their elected representatives over the co-operative.

Possibly the single most important criticism of covert accumulation is that it reduces the responsibility of each and every member to finance his or her co-operative directly and at a level sufficient for its present and future successful operation. The practice is therefore ultimately defeatist since it allows members to avoid the full financial responsibility for their actions, a tenet that is central to the philosophical basis of co-operative action.

REFERENCES AND BIBLIOGRAPHY

1. Carpenter, S. M., *Some economic and social aspects of agricultural co-operation in West Germany* (unpublished M.Phil. Thesis, University of London, Wye College), 1977. (A comprehensive review of contemporary German theory regarding co-operative action.)
2. Central Council for Agricultural and Horticultural Co-operation, *Report of the Working Party on Agricultural Co-operative Law*, London, 1971.
3. Central Council for Agricultural and Horticultural Co-operation, *Report of the Working Party on Investment Capital in Agricultural Co-operatives*, London, 1974.
4. Central Council for Agricultural and Horticultural Co-operation, *Financing of Co-operatives by Members*, London, 1981.
5. Emelianoff, I. V., *Economic theory of co-operatives*, Edward Brothers, Int., Washington DC, 1942.
6. Helmberger, P. G. & Hoos, S., Co-operative enterprise and organisation theory, *Journal of Farm Economics*, **44**(2) (1962), pp. 275–90.
7. Kraenzle, C. A. & Volkin, D., *Subsidiaries of agricultural co-operatives*, United States Department of Agriculture, Economics Statistics and Co-operatives Service, Co-operative Research Report No. 4, 1979.
8. Murray, G. C., *Co-operation, capital and control: A study of member and management behaviour in agricultural co-operatives in the East Anglian Region of the United Kingdom*, 1981.
9. Murray, G. C., Towards an agricultural co-operative classification, *Journal of Agricultural Economics*, **34**(2), 1983.
10. Olsen, M., *The logic of collective action*, Shocken, Harvard University Press, 1968.
11. Phillips, R., Economic nature of the Co-operative Association, *Journal of Farm Economics*, **35**(1) (1953), pp. 74–87.
12. Pickard, D. H., *Report on a detailed study of two groups*, Produce Studies Ltd, Newbury, England, 1968.
13. Pickard, D. H., *A guide to group development*, Produce Studies Ltd, Newbury, England, 1969.
14. Plunkett Foundation for Co-operative Studies, Capital maintenance and accumulation in agricultural co-operative societies, *Co-operative Communication No. 2*, November 1979, Oxford.
15. Plunkett Foundation for Co-operative Studies, *Agricultural Co-operation in the United Kingdom, Summary of Statistics 1970–71 & 1980–81*, Oxford.
16. Robotka, F., A theory of co-operation, *Journal of Farm Economics*, **29**(1) (1947), pp. 94–114.
17. Sargent, M. J. & Roxburgh, C. D. L., *Management and the growth and development of horticultural marketing co-operatives*. Horticultural Group, School of Biological Sciences, University of Bath, 1977.
18. Sargent, M. J. & Doherty, N. M., *Agricultural co-operation in practice*, England, University of Bath, 1977.