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CEYLON'S CROP INSURANCE EXPERIENCE
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ADVANTAGES AND PROBLEMS

The basic purpose of crop insurance is to ensure that the money and labour expended by a farmer on the production of his crops are not entirely wiped out by natural hazards beyond his control. The provision of at least a minimal income at times of crop failure in return for regular premium payments enables a farmer to obtain necessary inputs and continue cultivation uninterrupted by crop failure.

This is of particular significance to peasant farmers without a reservoir of savings as they are likely to be driven to non-institutional high interest lenders by crop failure. Apart from high rates of interest, such borrowing for either consumption or production purposes may commit the farmer in advance to sell his produce at below market prices at harvest. This is possible even where there is a support price above market price, as the borrower's crop is considered collateral security for the loan and often the principal and interest are collected right on the borrower's threshing floor. Recourse to such sources of borrowing tends to decrease both the capacity for, and profitability of, investment by the farmer. A crop failure may be the basis for a peasant farmer being enmeshed in the familiar 'vicious circle' of poverty.

The transformation of peasant agriculture to higher productivity levels requires an increasing use of capital inputs such as fertilizer. Crop insurance could be of particular value in minimizing the risk of using such inputs. As Ray observes: "Insurance gives farmers greater confidence in venturing upon the adoption of new and improved farming practices and in making greater investment in agriculture for improving crop yields and increasing agricultural production."[1] This incentive can be reinforced and strengthened by offering higher indemnity coverages on lands cultivated with improved techniques.

Other advantages of crop insurance include the expansion of cultivable area; the staggering of the cultivation season enabling a more economic utilization of water and other resources; greater credit worthiness enabling more liberal institutional credit; the decreased liability of the community at times of crop failure and the stabilization of the purchasing power of a significant proportion of the population.[2]

However, the problems of low productivity and low income endemic in peasant agriculture arise from a multiplicity of causes. These include uneconomic-sized holdings, disincentive tenure conditions, uncertain and low prices, inadequate and costly non-institutional credit facilities, the non-availability of inputs and

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1. P. K. Ray: Agricultural Insurance—Principles and Organization and Application to Developing Countries, Pergamon Press, Oxford, 1967, p. 28.
2. *ibid.*, pp. 27-29; also P. K. Ray: Report to the Government of Ceylon on Crop (Paddy) Insurance, Sessional Paper XIV—1957, Ceylon Government Press, July, 1957, pp. 21-22.

inadequate technical knowledge and experience. The resolution of these problems requires a comprehensive and integrated agricultural programme ensuring land reform, guaranteed minimum and stable prices, establishment of satisfactory marketing organization, expansion of cheap institutional credit sources and a satisfactory extension service. Crop insurance could contribute significantly to increased productivity in peasant agriculture when conceived of as a facet of such a well-rounded agricultural programme.

While the advantages of crop insurance are numerous its introduction in peasant agriculture in particular is ridden with difficulties. The inadequacy of sufficiently long period statistical data upon which to base an actuarially sound insurance programme; the limited resources of peasants often rendering the levy of an actuarially computed premium unrealistic; the variety of agricultural practices and productivity levels necessitating complex and different premium rates and indemnity coverages; the dearth of sufficiently trained personnel to supervise and execute expeditiously insurance claims particularly at field level and the inadequate appreciation of crop insurance benefits resulting in its misapprehension as a government taxation measure; all these involve considerable difficulties in implementing crop insurance in peasant agriculture.[3]

Ceylon's crop insurance experience since 1958 is of particular value in ascertaining the practicability of crop insurance in such a context and for the consideration of modifications necessary for its effective implementation.

PHASES OF IMPLEMENTATION AND FEATURES OF CEYLON'S SCHEME

A pilot crop insurance scheme was inaugurated in the *Maha* season 1958.[4] This scheme covered approximately 26,000 acres of paddy selected from five of the 22 revenue districts.[5] The scheme was based on administrative regulations till 1961 when the Crop Insurance Act was legislated.

In the *Maha* paddy cultivation season 1962-63, the area covered by insurance was extended to around 65,000 acres in 11 districts. It was further extended in the *Maha* season 1963-64 to its present extent of 200,000 acres in 16 revenue districts.[6] Apart from this area insured in the *Maha* season, of this extent, the area cultivated in the *Yala* season is also covered by insurance. The total extent of paddy lands presently covered by insurance in both seasons is approximately 15 per cent of the total area cultivated.

Crop insurance is compulsory in the areas covered by the scheme. It is an 'all risk' rather than a 'specific risk' insurance scheme. Damage to crops caused by drought, lack of water, excessive water, floods, plant diseases, insect infestations,

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3. P. K. Ray: Agricultural Insurance, *op. cit.*, pp. 282-285.

4. The two main cultivation seasons for paddy in Ceylon are the *Maha* (main season) and *Yala* seasons. The seasons vary in different parts of the country. Generally the *Maha* season commences in July/January with harvesting in March/June. The *Yala* season commences in around March/June with harvesting around July/September. The area presently cultivated in *Maha* is around 1·1 million acres and in *Yala* 0·6 million acres.

5. Government of Ceylon: Administration Report of the Commissioner of Agrarian Services for 1959, p. KK 59.

6. Government of Ceylon: Administration Report of the Commissioner of Agrarian Services for 1962-63, p. KK 64.

wild boar and wild elephant destruction and loss of crops due to the introduction of approved methods of farming are indemnified.[7]

The scheme was envisaged as a partially subsidized venture rather than an actuarially based self-financing self-liquidating one. The scheme operates on an uniform premium rate of Rs. 6 per acre. On an actuarial basis, some areas require a higher and others a lower premium charge than the uniform Rs. 6 per acre. However, the overall position is that with an uniform charge of Rs. 6 per acre there is a shortfall from the actuarially computed aggregate premium dues. This deficit—the premium subsidy—as well as the costs of administration were to be borne by the government.[8]

It is not compulsory for the premium payment to be made prior to commencement of cultivation. Premium is payable after harvesting, if desired, so as to make premium payment less burdensome. The premium could also be paid in kind when produce is sold to the multi-purpose co-operative societies.[9]

The indemnity coverage varies from a minimum of Rs. 100 (approximately 7 bushels of paddy) per acre in both the seasons to a maximum of Rs. 180 (approximately 13 bushels of paddy) per acre in the *Maha* season and Rs. 160 (approximately 11½ bushels of paddy) per acre in the *Yala* season. The variation in coverage is dependent on both risk probability and productivity levels. Lower risk probability areas and higher productivity areas qualify for higher indemnity coverages. The maximum indemnity coverage per acre is limited to the value of 50 per cent of average yield in specific areas at the government guaranteed price. This is in keeping with the insurance principle of limiting indemnity payment to only a proportion of normal income.[10]

As an incentive for the adoption of improved techniques of cultivation there is a higher coverage of 10 per cent, without an extra premium charge, for the adoption of improved techniques. These improved techniques are row-sowing, transplanting or row-transplanting of pureline seed, use of weedicides or weeding or harrowing and the use of approved fertilizer.[11]

Indemnity is payable proportional to both the stage of production at which crop loss occurs as well as the extent of loss. When loss occurs at a stage when re-sowing or replanting is still possible only 15 per cent of indemnity is payable. This covers only assets of initial sowing. When crop loss is after this stage but before flowering 70 per cent of indemnity is payable. Full indemnity is payable when loss is after flowering.[12] Indemnity is payable only if the extent of damage exceeds 30 per cent of average yields of the insurance unit. The insurance unit consists of the entire farm under paddy cultivation and not each individual plot. Notice of damage has to be given within 21 days.

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7. *ibid.*, p. KK 65.
8. Government of Ceylon : Administration Report of the Commissioner of Agrarian Services for 1959, p. KK 60.
9. Cop Insurance Act No. 13 of 1961, Sections 7(1), 11(1) and 15(4).
10. *ibid.*, Section 25.
11. Government of Ceylon : Administration Report of the Commissioner of Agrarian Services 1961-62, p. KK 53.
12. Government of Ceylon : Administration Report of the Commissioner of Agrarian Services 1964-65, p. KK 67.

INSURANCE EXPERIENCE

A ten-year period of crop insurance is too brief for an assessment of the actuarial soundness of the scheme or for computing an actuarially sound premium rate. However, the operation of even a limited scheme, as in Ceylon, provides more reliable data to incorporate in an adjustment and revision of actuarial statistics.

The actuarial experience of Ceylon's crop insurance scheme is summarized in Table I in three phases. In each of the first two phases 1958-59 to 1960-61 and 1961-62 to 1963-64 and in both the phases taken together conditions were extremely favourable. The third phase 1964-65 to 1967-68 has been an unfavourable one with high indemnity payments.

In the ten-year period premium dues exceeded indemnity paid by Rs. 0.52 million. Indemnity paid was only 93.7 per cent of premium dues. Although the uniform premium rate of Rs. 6 per acre was expected to be supplemented by a premium subsidy, during the ten years of its operations premium dues exceeded indemnity payments by 6.3 per cent. This implies that the data or methods used to compute the premiums resulted in rates much higher than necessary to cover indemnity payments.

The total costs of the scheme, inclusive of administrative costs exceeded premium dues by less than Rs. 1.53 million. The premium dues in the first two phases exceeded indemnity paid by Rs. 1.5 million and even exceeded total expenditure inclusive of administrative costs by Rs. 0.9 million. The indemnity paid in the first and second phases was only 21.7 per cent and 28.6 per cent respectively of premium dues. During the third phase indemnity payments exceeded premium dues by Rs. 0.99 million or 16 per cent of dues.

The inability to collect premium dues has been one of the most serious deficiencies of the scheme. The shortfall in premium collection has been as much as Rs. 4.98 million or 60.1 per cent of the dues. In terms of indemnities paid premium collection has accounted for only 42.2 per cent of indemnity payment.

Premium collection which was only 17 per cent in the first phase increased to 39.5 per cent and 41.1 per cent in the second and third phases respectively. The collection for the entire period was only 39.5 per cent of the dues. The improvement in premium collection does not in fact indicate a fundamental change of conditions but reflects the greater possibility of compulsory collection from indemnity payments and from sale proceeds under the government's Guaranteed Price Scheme for paddy.

As shown in Table II, from 1965-66 to 1967-68 less than 0.5 per cent was voluntarily collected through cultivation committees. The bulk of the dues has been collected from indemnity payments. The possibility of collection from sales under the Guaranteed Price Scheme varies with the attractiveness of this price as against the open market price. The substantial decline in collections through this method in 1967-68 is indicative of the lesser effectiveness of the Guaranteed Price Scheme, due to higher open market prices.

TABLE I—ANALYSIS OF CROP INSURANCE EXPERIENCE, CEYLON: 1958-1967

(in Rs.)

Year or period	1 Premium due	2 Premium collected	3 Indemnity paid (includes commissions paid)	4 Total expenditure (i.e., indemnity, commissions paid and administration expenses)	Shortfall (—) or surplus (+) between			As percentage of premium dues		
					5 Premium collected and premium due (2—1)	6 Premium due and indemnity paid (1—3)	7 Premium collected and indemnity paid (2—3)	8 Premium collected (2 as % of 1)	9 Indemnity paid (3 as % of 1)	10 Premium collected as % of indemnity paid (2 as % of 3)
First phase										
1958-59 ..	140,472	17,602	41,034	79,525	—122,870	+ 99,438	— 23,432	12·5	29·2	42·9
1959-60 ..	146,604	24,399	39,261	84,277	—122,205	+107,343	— 14,862	16·6	26·8	62·1
1960-61 ..	142,764	31,166	12,902	67,858	—111,598	+129,862	+ 18,264	21·8	9·0	241·6
Total : First phase ..	429,840	73,167	93,197	231,660	—356,673	+336,643	— 20,030	17·0	21·7	78·5
Second phase										
1961-62 ..	182,124	75,812	19,030	92,087	—106,312	+163,094	+ 56,782	41·6	10·4	398·4
1962-63 ..	408,184	167,693	166,577	191,087	—240,491	+291,607	+ 51,116	41·1	28·5	143·8
1963-64 ..	1,049,130	404,693	334,180	615,626	—644,437	+714,950	+ 70,514	38·6	31·8	121·1
Total : Second phase ..	1,639,438	648,198	469,787	898,800	—991,240	+1,169,651	+178,412	39·5	28·6	138·0
Total : First two phases ..	2,069,278	721,365	562,984	1,130,460	—1,347,913	+1,506,294	+158,381	34·8	27·2	128·1
Third phase										
1964-65 ..	1,517,938	460,200	1,368,780	1,672,699	—1,057,738	+149,158	— 908,581	30·3	90·1	33·6
1965-66 ..	1,532,002	830,142	2,281,769	2,633,558	—701,860	—749,767	—1,451,627	54·2	149·0	36·4
1966-67 ..	1,545,982	633,779	1,941,413	2,306,754	—912,203	—395,431	—1,307,634	39·7	125·6	32·6
1967-68 ..	1,569,786	607,822	1,559,259	2,021,342	—961,964	—10,527	—951,437	38·7	99·3	39·0
Total : Third phase ..	6,165,708	2,531,943	7,151,221	8,634,353	—3,633,765	—985,513	—4,619,279	41·1	116·0	35·4
Total : All three phases ..	8,234,986	3,253,308	7,714,205	9,764,813	—4,981,678	—520,781	—4,460,898	39·5	93·7	42·2

Source : Crop Insurance Division, Department of Agrarian Services, Ceylon.

TABLE II—METHODS OF PREMIUM COLLECTION : 1965-66—1967-68

(in Rs.)

Methods of collection	1965-66	1966-67	1967-68	1965-66—1967-68
Cultivation Committees	2,791 (0·3)	3,266 (0·5)	4,599 (0·8)	10,656 (0·5)
Guaranteed Price Scheme	265,426 (32·0)	151,438 (23·9)	17,782 (2·9)	434,646 (21·0)
Indemnity payment	561,926 (67·7)	479,075 (75·6)	585,441 (96·3)	1,626,442 (78·5)
Total	830,143 (100·0)	633,779 (100·0)	607,822 (100·0)	2,071,744 (100·0)

Note: Figures in brackets denote percentages to the total.
Source: Crop Insurance Division, Department of Agrarian Services, Ceylon.

The concession afforded to farmers to pay the premium at harvest time coupled with the compulsory nature of the scheme entitles a farmer to claim indemnity coverage at times of crop failure without necessarily making a prior premium payment. However, when indemnities are paid all premium dues can be deducted from them.

The recovery of premium dues from indemnities defeats a fundamental purpose of insurance. When several premiums are deducted from a single indemnity payment, a large proportion of the indemnity may not be paid to the farmer at crop failure. This defeats the crop insurance objective of providing the farmer with adequate funds at times of crop failure to tide over till the next harvest.

Though the scheme was expected to be one of only partial subsidization, the inability to collect premium dues has resulted in subsidization to the extent of Rs. 6.51 million or 71 per cent of total expenditure. Had all premium dues been collected the scheme would have been subsidized to the extent of Rs. 1.53 million or 16 per cent of expenditure.

The high rate of default in premium payment is attributed to a lack of appreciation of benefits of crop insurance and the expectation of such benefits without an obligation to make payment. The lack of response in low crop-loss probability areas may also be due to the relatively high premium rates consequent on the averaging of such rates.[13]

The averaging of premium rates raises a rather basic issue of equity in premium rates. A crop insurance programme attempts to spread losses over many persons exposed to the same risks; to spread losses over many areas and over many years. It is not sufficient that actuarial computations balance aggregate premium dues and indemnity payments over many years. It must also ensure that persons of discernibly different risk probability are not categorized in the same actuarial unit.

Under the present scheme farmers in low risk probability areas are in effect subsidizing some in high risk probability areas. The crop-loss probability in the

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13. Government of Ceylon: Ministry of Planning and Economic Affairs, Agricultural Development Proposals, 1966-70, p. 141.

16 areas covered vary from .010 to .122 in the *Maha* season and from .013 to .930 in the *Yala* season.[14] This implies that a farmer in the lowest risk area pays Rs. 6 instead of Re. 1 the actuarially computed premium.

The justification advanced for the rather extreme averaging of risk is that indemnity coverages are higher in these areas than in the higher risk areas.[15] However, to a farmer in a low risk probability area a higher indemnity coverage is not an inducement as he has little expectation of being indemnified. Since his need for insurance is less, it is more logical to offer such insurance at lower cost.[16] The differences in the rate of indemnity coverage should reflect production costs and productivity levels rather than crop-loss probabilities.

In an attempt to keep premium rates within the paying capacity of the farmer, indemnity coverages have had to be kept commensurately low. Present coverages from Rs. 100 to Rs. 180 per acre are around a sixth to a third of the value of the average national yield per acre.[17]

These coverages do not in many cases cover even costs of farm inputs obtained from outside. Evidence recently obtained suggests a total average cost of paddy production of Rs. 380 per acre of which Rs. 280 consists of outside costs. The total costs vary from a high of Rs. 560 to a low of about Rs. 250. The cost of farm inputs purchased from outside varies from Rs. 340 to Rs. 160.[18]

Inadequate indemnity coverage fails to ensure that a natural hazard does not wipe out money and labour expended by a farmer in cultivation or enable him to continue his cultivation in the subsequent period without interruption. With inadequate indemnity coverage a farmer may still be driven into the hands of high interest moneylenders or merchants and be again enmeshed in a 'vicious circle' reducing both his capacity for, and profitability of investment. The upward revision of coverages and premium rates commensurate with enhanced coverages is particularly relevant in a context, such as in Ceylon, where the cost of inputs, average yields and price of paddy have risen.

The inadequacy of personnel to handle the scheme, particularly at field level, has resulted in indemnity payments taking between three to six months. This could jeopardize the very objective of providing adequate relief at times of crop failure so essential in a peasant agricultural context of both inadequate personal savings and institutional credit.

The provision for crop losses to be notified within as long a period as 21 days deprives a close field inspection and verification of claims thereby increasing the 'moral hazard' of insurance.

CONCLUSIONS

The brief period of crop insurance in Ceylon has highlighted difficulties inherent in reconciling, low premium rates within the paying capacity of the

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14. *ibid.*, p. 147.

15. *ibid.*, p. 136.

16. *ibid., loc. cit.*

17. The average national yields per acre in the three recent seasons were 42 bushels in *Yala* 1967; 47·5 bushels in *Maha* 1967-68 and 44·5 bushels in *Yala* 1968. At the Guaranteed Price of Rs. 14 per bushel, the values of these yields are between Rs. 588 and Rs. 665 per acre.

18. This estimate is based on unpublished data collected for the Central Bank of Ceylon in "Survey of the Cost of Production of Paddy 1966."

peasant farmer, with adequate indemnity coverages. In attempting such reconciliation the scheme has run the risk of providing inadequate coverages, inequitable premium rates due to the averaging of premium rates and a high level of government subsidization.

An actuarially based self-financing, self-liquidating crop insurance scheme is difficult of realization in a peasant agricultural context as premium rates tend to be too high in certain areas. In this sense, crop insurance should be considered a measure of agricultural support and subsidization to ensure stability.

In subsidizing crop insurance, the government could bear fully the administration costs of the scheme as well as make an allocation of a premium subsidy. This subsidy could bear actuarially computed premium rates above a maximum rate determined as too high a cost to the farmer.[19] The averaging of premium rates to balance high risk areas with low risk areas penalises farmers in the latter areas to the benefit of the former. Such averaging of premium rates rendering the scheme inequitable may vitiate the scheme by withholding the interest and participation of the farmer. Premium rates should reflect crop-loss probability while indemnity coverage should reflect production costs and productivity levels.

However, the extent of subsidization in Ceylon has been of a higher magnitude than anticipated due to the inability to collect premium dues. The inability to collect premium dues and the compulsory collection of most such dues focusses attention on two important issues. First, it raises doubts about the feasibility of a crop insurance programme on a voluntary basis and second, the inadvisability of premium collection from idemnity payments. Such collections from indemnity payments erode into a substantial proportion of the indemnity coverage and defeat the purpose of such coverage.

These difficulties suggest that a crop insurance scheme should be effectively dovetailed and integrated with other agricultural programmes with eligibility to benefits of each such programme dependent on commitment to all. Programmes of particular relevance in this connection are marketing, credit and insurance. Integration with marketing organization is particularly feasible in the context of guaranteed prices above open market prices. The linking of institutional credit to crop insurance could, on the one hand, ensure more ready recovery of credit and, on the other, make premium payment an automatic collection.[20]

The inadequacy of staff adequately trained to make crop-loss adjustments at field level renders decentralization of the scheme difficult. However, such decentralization is necessary to ensure both expeditious payment of indemnities as well as reduction of 'moral hazards.'

Though crop insurance in peasant agriculture is bound to run into considerable difficulties, even a limited programme such as has been tried in Ceylon, provides an experience for modification and refashioning of the scheme oriented to particular conditions. The availability of better actuarial data and the extension of the scheme linking it with institutional credit may in the long run render the earlier years' experience valuable.

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19. Nimal Sanderatne, "Crop Insurance—An Assessment and New Directions," *Central Bank of Ceylon Bulletin*, October, 1968, pp. 33-36.

20. *ibid.*, pp. 38-39.