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ROLE OF RISK AND UNCERTAINTY IN KANGRA TEA PLANTATION

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This paper attempts to assess the role of technical, psychological, income, yield, contractual uncertainties as well as those arising from natural factors and from government action in tea plantation of the Kangra district in the Punjab. It deals with the findings of a personal survey of 15 Tea Estates of Palam and Kandi Zones of Kangra district, conducted during September-October 1963. This study aims at examining and assessing the role of risk caused by various uncertainties in decision-making of tea growers with regard to existing plantation and future plan of its extension. Suggestions of the tea growers combined with the inferences derived from the enquiry, offer possibilities to reduce adverse effect of uncertainties on tea plantations of Kangra (Punjab).

Method and Material

The area of enquiry covers 132 tea estates, ranging from 10 acres to 1,100 acres in size (*i.e.*, above 4.05 up to 562.92 hectares); and excludes 1,027 tiny estates below 10 acres (*i.e.*, up to 4.05 hectares) (1 hectare = 2.47105 acres or roughly 2.5 acres).

TABLE I—SIZE-GROUP OF TEA ESTATES OF KANGRA DISTRICT (AS ON 31-3-1961) AND SAMPLE SELECTED FOR SURVEY (SEPTEMBER-OCTOBER, 1963)

Size of Tea Estate	Number of Estates	Area in hectares	Number of Estates selected	Area in hectares	Percentage of Estates surveyed	Percentage of tea area covered in survey
1	2	3	4	5	6	7
Tiny size (upto 4.05 hectares)	1027	1095.05	—	—	—	—
Small size (above 4.05 upto 60.70 hectares)	123	1422.30	12	141.6	10	10.0
Medium size (above 60.70 upto 121.41 hectares)	5	400.00	1	108.00	20	27.0
(above 121.41 upto 202.34 hectares)	3	407.52	1	136.40	33	33.8
(above 202.34 upto 404.69 hectares)	—	—	—	—	—	—
Large size (above 404.69 hectares)	1	562.92	1	562.92	100	100.0
Total	1,159	3,887.79	—1,027	—1,095.05		
	132	2792.74	15	948.92		

Note : The columns from 1 to 3 are based on the table appeared in the report on the tour of investigations recently carried out by Shri S. K. Datta, Chief Advisory Officer and other members and Shri K. M. Kidwai, Director of Tea Development, Tea Board.

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Within the limited time and resources at disposal, it could not be feasible to extend the enquiry upto all tea growers (including 1,027 tiny estates below 10 acres in size) of the Kangra district. Being the counterpart of crop farming, these tiny tea estates do not form a separate entity from management point of view. Farming seems to offer them higher income than tea plantation. Hence their problems too are different and are never truly representative of tea growers who are basically tea plantation minded. We selected a sample of 1, 2 and 12 tea planters from large, medium and small tea estates, respectively, which formed 100, 26.5 and 10 per cent of the estates respectively. The percentage of medium and large tea estates represented in the sample have risen due to small number of estates falling in these categories. Proformas were used for collection of data.

All the 15 tea planters experienced uncertainty about rainfall, yield, prices and income (Table II).

TABLE II—UNCERTAINTY IN RELATION TO SIZE OF TEA ESTATES

Sample size	Income	Yield	Price	Natural factors (rainfall, hail storms)	Psychological	Contractual	Technical	Government Programme
Small	12	12	12	12	11	4	3	2
Medium	2	2	2	2	2	0	0	0
Large	1	1	1	1	1	-	-	-
Total :	15	15	15	15	14	4	3	2
Percentage of Tea Estates Surveyed	100	100	100	100	93.3	26.7	20	13.3

It will be seen from Table II that out of the 15 tea growers interviewed, 93.3, 26.7, 20 and 13.3 per cent experienced psychological, contractual, technical and government programme-oriented uncertainties respectively. However, medium and large growers do not seem to experience the last three types of uncertainties.

Yield Uncertainty

Income uncertainty arises because of variations in yield, cost of input and price of output. Yield uncertainty commands its crucial position because it determines the price of tea combined with its demand.

TABLE III—AVERAGE PER ACRE YIELD OF TEA ACCORDING TO DIFFERENT SIZE OF TEA ESTATES SURVEYED

Year	Small	Medium	Large	Overall average
1959-60	352.24	876.00	N.A.	614.12
1960-61	351.73	910.80	245.38	502.57
1961-62	373.43	570.04	223.93	389.13
1962-63	389.49	477.39	205.73	357.53
1963 upto Oct. 1963	328.36	616.00	N.A.	477.18

(in lbs.)

It will be seen from Table III that yield per acre of manufactured (Black and Green) tea has been steadily rising in small tea estates whereas in medium and large tea estates it tended to decline. However, the yield per acre remained highest in medium tea garden and the lowest in the large tea garden. This trend seeks some positive correlation with the existing labour per hectare employed and demanded by the medium growers.

Uncertainty in Rains :—Yield uncertainty of tea has been attributed to irregularity of rains, scarcity of garden labour and poor growth of tea leaves due to inadequate pruning, hoeing of bushes and non-revitalisation of exhausted soil. It may be noted that in July, August and September rains were excessive throughout the four years from 1959 to 1962. Annual rainfall also varied significantly by 17.38 inches between 1958-59 and 1959-60. Similarly, annual rainfall rose from 2,376.90 millimetres in 1960-61 to 3,349.20 millimetres in 1961-62, *i.e.*, by 972.30 millimetres. During the monsoon period, plucking of tea leaves clashes with the weeding of paddy fields; therefore, a situation of acute competition between the demand for paddy labour and tea garden labour springs up. Heavy rains delay the tea plucking while labour shortage makes it more difficult.

Labour Uncertainty :—Farm labour, which is a part-time garden labour, returns to farms during busy season. The effect of labour shortage is reflected in rising wages and deterioration of quality of tea leaves due to late plucking. Shortage of garden labour is becoming a permanent feature of Kangra tea plantation. Table IV shows the actual labour situation in Kangra tea gardens.

TABLE IV*—POSITION OF TEA PLANTATION LABOUR IN SELECTED TEA ESTATES (KANGRA)

Part—A : Existing Tea Labour (September-October, 1963)							
Size of Tea Estates (1)	Child (2)	Female (3)	Male (4)	Total (5)	Total Adult work units (6)	Per hectre adult work units (7)	
Small	3	71	72	146	131.35	0.92	
Medium	96	143	166	405	362.00	1.05	
Large	14	74	113	201	184.10	0.32	
Total	113	288	351	752	677.45	Average 0.76	
Part—B: Tea Labour Requirement							
Small	61	153	103	317	277.25	1.95	
Medium	166	220	225	611	542.10	2.21	
Large	300	400	400	1,100	975.00	1.70	
Total	527	773	728	2,028	1,794.35	Average 1.95	
Part—C : Tea Labour Short of Requirement							
Small	58	82	31	171	135.90	1.03	
Medium	70	77	59	206	180.10	1.16	
Large	286	326	287	899	790.90	1.38	
Total	414	485	377	1,276	1,106.90	Average 1.19	

* Atwants conversion table has been applied to compute column numbers 6 and 7.

Large and medium tea estates maintained large fleet of permanent tea labourers. Nevertheless, these estates are confronted with uncertain and short supply of labour in peak season. This is in contrast to the situation in small tea estates where family labour formed a significant portion of working labour force. Due to increasing dependence on hired labour, uncertainty in the availability of tea labour increased in relation to increase in size of tea estates. Small tea estates had 0.92 labour (adult work) unit, which fell short of requirement by 1.03 labour (adult work) unit per hectare. Corresponding to these, medium tea estates had 1.05 labour (adult work) unit per hectare. This seeks a positive correlation with the largest yield of 616 lbs. of tea per acre (vide Table III) in the current year, *i.e.*, upto October 1963. In the preceding year also, tea yield per acre was highest (477.39 lbs.) in medium tea estates as compared to 205.73 lbs. and 389.49 lbs. of tea per acre in large and small tea estates respectively. Due to uncertainty and short supply of tea labour, the large tea estate followed by small tea estates recorded low yield per acre of tea during all the past four years. During the current year, the large tea estate had only 0.32 labour (adult work) unit per hectare, which fell short of the requirement by 1.38 labour (adult work) unit per hectare. Input of tea labour (adult work unit) per hectare available at present worked out to 0.76 on an average for all size of tea estates, which accounted for less than half of the requirement.

Since child and female labour are best suited to leaf plucking, due to their swiftness, their shortage is experienced for the same. In addition, female labour is good at hoeing and pruning of tea bushes, hence the number of female labour required is the highest (*i.e.*, 773 out of 2,028 adult work units). The dearth of child labour is attributed to implementation of compulsory education programme. The role of female labour in tea plantation has thus increased doubly (i) due to their swiftness in work and (ii) due to its substitutability with child labour. Though mobility of female labour is relatively very low still some diversion from tea plantation to newly opened local weaving centre has been witnessed. Uncertainty and shortage of male labour in tea gardens are attributed to : (i) emergency recruitment of suitable men for the armed force, and (ii) mobility from tea plantation work to various construction and development projects, *viz.*, construction work in Lahaul and Spiti, Mandi project, Hydel project, Bias link project, etc. As a solution to labour problem, few of the tea growers expressed the desire to make the local labour available on a permanent and regular basis but many of them have doubted its feasibility on the ground that (i) local labour is basically farm labour and afterwards part-time tea labour; therefore during peak farming period, its supply in tea gardens cannot be assured; (ii) small tea growers cannot afford to provide full year employment to hired labour in their tea gardens.

To relieve tea labour scarcity and its uncertainty import of cheap labour from densely populated States could be suggested but there are practical limitations to the implementation of this suggestion. The only alternative to solve the labour problem appears to be to give wage incentives. Tea growers agree on this point, provided they get increased returns from the sale proceeds of their tea at Amritsar or Calcutta markets. The switch over to quality control in manufacturing of black tea would lead to increased returns which in turn would enable to pay increased wages to tea labour.

Price Uncertainty

Due to blockade of Afghanistan, export market for Kangra tea, during last three years, and its price have fallen down considerably. In most cases, tea growers received less than half of the prevalent price of tea due to deterioration of old stock, unscientifically packed and stored. Tea growers expressed that tea stock accumulated at Amritsar could be saved from deterioration in quality and fall in price if air transport is provided on subsidised basis to export Kangra tea to Afghanistan.¹

Guaranteed pricing system can be suggestive of combating the price uncertainty of Kangra tea but for want of quality control and standardisation of tea, its feasibility is suspected. Tea growers anticipate provision of facilities for improved marketing, warehousing and manufacturing of tea with the setting up of Co-operative Tea Marketing Society at Amritsar and Co-operative Tea Manufacturing Factory under construction at Bir (Punjab). If the Export Promotion Council undertakes to explore new markets for Kangra tea, price uncertainty can be reduced considerably in so far as it is related to concentration of export market in Afghanistan only.

Influence of Uncertainties on Future of Tea Plantation

Kangra tea growers are ambitious to extent the area of tea plantation. But there are certain restraints on the extension programme which are related to rules and laws of rights in land, uncertainty in labour supply, lack of cheap credit for extension of plantation and purchase of manufacturing machines and uncertainty in export of tea.

Contractual Uncertainty

Unlike medium and large tea growers, 33 per cent of small tea growers faced contractual uncertainty with respect to the garden rented, on year to year basis. At least a tenure of five years is desired to encourage improvement in the rented garden. Due to uncertainty of tenure, use of fertilizers is restricted to owned gardens only. Similarly, deep pruning and hoeing are restricted to owned garden. In one case, small tea grower showed his preference for year to year tenure due to uncertainty of returns from the garden, depending upon the uncertain export of tea produced and price received for it. Rent fixed once in five years therefore is likely to go against the interest of tenant. This seems to be a more rational view.

The tea growers are finding it difficult to extend tea plantation to areas which were not under orchards or tea plantation on or before 1952-53, due to legal restrictions. Such land can be declared surplus after satisfying other conditions. Crop-lands of tea manufacturers and growers which are now with tenants under tenancy rights, are proposed to be shifted to tea plantation by 50 per cent of small tea growers because existing garden areas produce less raw material than is required by their factories. But in this context, technical difficulties are many. Firstly, the tenants cannot be ejected from the land in which they possess occupancy rights except for some specific reasons. This does not allow the owners

1. This has been suggested in lines with export of tea from Assam by air transport on the basis of subsidy offered by Tea Board.

of tea estates to extend tea plantation to such land. Secondly, Tea Board issues licence for extension of tea plantation to manufacturers only, for which the tenants of crop-land do not qualify. Thirdly, the tenants cannot afford to shift crop-land to tea plantation for another important reason that they cannot afford to live without income for 5 to 6 years until the new plantation starts giving returns. Fourthly, the uncertainty in labour supply for tea plantation also virtually discourages the extension of its area. Since green tea normally fetches Rs. 3.50 to 4.00 per kg. for bulk, any rise in labour wages would not cope with this meagre returns.

Technical Uncertainty

The uncertainty in export of Kangra tea causes fall in its market price, which affects the investment pattern of tea plantation. The low quality of Black and Green tea of Kangra is also responsible for its low prices. Improvement of quality can be possible if labour is easily available for plucking the fresh flushes in time because the fine leaves make fine quality tea. Want of modern machines and tools, viz., dryers, cutters and rollers, etc., are obstacles to the improvement of quality of tea. To cope with the production of raw material by small gardens, small dryers and rollers need to be supplied. At present, all small growers are depending on sunshine to dry tea and are using primitive types of rollers. Three out of the 12 small tea growers interviewed manufacture tea exclusively with manual labour. Others use power machines, which are out of date (except the Wah Tea Estate Factory) which need rationalisation to improve productive efficiency. The credit available from Tea Board at the rate of $6\frac{1}{4}$ per cent has not become popular among the local tea growers due to its high interest rate.

Credit Uncertainties

The tea growers as a class express their demand for cheap credit (even interest-free loans) from other financing agencies so as to encourage the extension of tea plantation area and also the rationalisation of old manufacturing machines. The recovery of such loans should be made on easy instalments only after 5 to 6 years in case of loan utilised for extension of tea plantation and at least 2 to 3 years when it is used for rationalisation of tea factories, so that return from such investment becomes available with the repayment of loans.

Fiscal Uncertainty

Excise duty on tea at 15 nP. per kg. raised to 18 nP. per kg. by imposing a special duty of 3 nP. per kg. has become unbearable to small growers. Since small growers do not have the economies of large scale, which the big and medium tea growers have, there must be adequate difference in the rates of excise duty to be paid by small growers. The same may be exempted in case of tea growers with small tea gardens below a bare minimum of tea production. This may be a good incentive to raise total tea production with small production units.

Recommendations

1. Price uncertainty of Kangra tea must be reduced by exploring new foreign markets, and improvement of quality of tea must be effected so that Kangra tea may become more popular in domestic and foreign markets.

2. Guaranteed pricing system may be adopted with quality control and standardisation of tea manufactured.
3. Labour uncertainty may be reduced by checking the mobility of tea garden labour to other construction projects, etc., for which wage incentive may be offered.
4. Tea Board should extend cheap and interest free loans for future development of tea gardens and rationalisation of old tea factories.
5. Land laws must be relaxed to facilitate the extension of tea plantation.
6. Discriminating excise duty pattern may be adopted to give incentive to small tea growers.

RISK AND UNCERTAINTY IN IRRIGATED CROPS

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The decision-making process in farming is a complex and difficult process which calls for better managerial skill on the part of the farmer. An analysis of the effect of the factors like yield, price, technology and policies of government on his net income would be of great importance in building his kit of tools. Indian agriculture is often characterised as tradition bound. Centuries old practices are still in vogue. In the area of study farmers are tradition bound as elsewhere in India. The purpose of this paper is to examine how far the actions of farmers conform to economic logic. In the light of the findings, some suggestions about possible directions along which farmers should move to increase their profits have been made.

*Risk and Uncertainty*¹

Risk refers to events which can be ascribed some probability of occurrence, whereas uncertainty refers to events which cannot be associated with any probability. Risk may be due to hazards like fire, death, hail storm, which can be predicted with some probability. Risks are insurable.

* This is a joint paper irrespective of the order of the authors' names.

1. (a) E. O. Heady: *Economics of Agricultural Production and Resource Use*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, pp. 439-534.
 (b) E. O. Heady and H. R. Jensen: *Farm Management Economics*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1960, pp. 515-550.