Crop Insurance Scheme: A case study of banana farmers in Wayanad district

Manojkumar K
Sreekumar B., Ajithkumar G. S.

Discussion Paper No. 54

Kerala Research Programme on Local Level Development
Centre for Development Studies
Thiruvananthapuram

Crop Insurance Scheme: A case study of banana farmers in Wayanad district

Manojkumar K., Sreekumar B, Ajithkumar G.S

English
Discussion Paper

First published 2003
Editorial Board: Prof. P. R. Gopinathan Nair, H. Shaji
Printed at:
Kerala Research Programme on Local Level Development
Published by:
Dr K. N. Nair, Programme Co-ordinator,
Kerala Research Programme on Local Level Development,
Centre for Development Studies,
Prasanth Nagar, Ulloor,
Thiruvananthapuram 695 011
Tel: 0471-2550 465, 2550 427
Fax: 0471-2550 465
E-mail: krp@cds.ac.in
www.krpcds.org
Cover Design: Defacto Creations

ISBN No: 81-87621-57-5

Price: **Rs 40**
US$ 5

KRPLLD 2003 0650 ENG

Contents

Crop Insurance Scheme: A case study of banana farmers in Wayanad district

Manojkumar K., Sreekumar B., Ajithkumar G.S

1. Introduction

Agriculture is subject to vagaries of Nature such as flood, drought, tornado, and lightning. In the face of uncertainty and risk faced by the farming community, various schemes have evolved over time in different countries to protect farmers against risks, such as guaranteed prices, subsidised credit, and crop insurance.

Crop insurance is recognised to be a basic instrument for maintaining stability in farm income, through promoting technology, encouraging investment, and increasing credit flow in the agricultural sector. It contributes to self-reliance and self-respect among farmers, since in cases of crop loss they can claim compensation as a matter of right (Chandrakanth, 1976). Thus, crop insurance cushions the shock of crop loss by assuring farmers protection against natural hazards beyond their control. The Central Government and the State Governments in India have constituted in recent years several crop insurance schemes.

Crop insurance – a caring principle

The basic principle underlying crop insurance is that the loss incurred by a few is shared by many in an area. Also, losses incurred in bad years are compensated from resources accumulated in good years (Dandekar, 1976).

In general, the principle of crop insurance may be outlined as follows:
(1) Uncertainty faced by individual farmers is transferred to the insurer through their participation in large numbers, for which benefit, the insured farmers pay a risk premium.

(2) Total loss is shared by all the participating farmers over a wide area, i.e., horizontal spreading of risks over a wide and vertical spreading over many years.

(3) The risk premium reflects the group risk assumed by the insurer; an indemnity is liable to be paid to the individual farmer when a loss is incurred due to causes beyond his control, as long as he maintains the insurance contract valid by paying the premium without default.

ACKNOWLEDGEMNENT: *We acknowledge with gratitude the able guidance, meticulous care, and constructive criticisms of Dr K. Narayanan Nair, Programme Co-ordinator, KRPLLD. The financial assistance to the project from KRPLLD is also acknowledged. We are indebted to the Office of the Joint Director of Agriculture, Wayanad district and Directorate of Agriculture for their kind co-operation and support during the work. The study would have remained incomplete without the help of the staff of the Krishi Bhavans of Padinharethara, Ambalavayal, and Panamaram* panchayats. *We thank them for their help at all stages of our field investigation. Our sincere thanks also to the farmers of the study area, who whole-heartedly co-operated in our study.*

Manojkumar K., Sreekumar B., Ajithkumar G.S are working with Agricultural and Rural Development through Rapid Action (ARDRA), Thiruvananthapuram.

The problem and its niche

Constant and continuous monitoring is vital for the successful implementation of any programme. Monitoring helps to measure the outcome of a programme and unravel problems in its implementation.

High rates of premium, is considered the main problem with crop insurance schemes in India. Attempts have been on for bringing the rates down, by lowering the indemnifiable limit. Alternative methods of calculation of premium rates have been attempted to reduce the burden of premium to the farmers and to motivate them to produce more without the fear of possible loss or risk.

In Kerala, the General Insurance Corporation (GIC) has been the precursor of crop insurance. The State Government stepped in only lately. It seems that the premium rates and indemnities have been decided by the state on an arbitrary basis. As is well known, the State consists of different agro-climatic zones with varied types of soil fertility and weather conditions. Inputs, cultivation practices, and managerial systems are also different for each zone. Hence the premium rates and indemnities fixed at uniform rates for the State as a whole are unrealistic. It would be meaningful only if premium rates and indemnities are fixed differently for different agro-climatic zones. The viability of an insurance programme would depend, in the long run, on the ability of the insurer to provide economically viable and realistic premium rates for farmers.

The present study of the State Crop Insurance Scheme for the banana farmers in Wayanad district is taken up with a view to critically examining its rates and the problems encountered in its implementation. Banana happens to be the single-largest crop covered under the State Crop Insurance Scheme in Kerala. According to the Directorate of Agriculture, Kerala, about 48 percent of the total indemnity paid in the State has gone to the banana crop.

The study is conducted in the Wayanad district, which is found to have received as its share of indemnity 14.33 percent of the total indemnity paid to all the crops all over the State. Further, this district has received the maximum amount of indemnity paid for banana under the programme.

Objectives

The present study is undertaken with the following major objectives:

(i) To study the functioning of the State-sponsored crop insurance scheme;
(ii) To identify the existing problems in implementing the scheme;
(iii) To estimate the realistic premium rates for crop insurance scheme for banana cultivation;
(iv) To study the possibility of including risks like *Kokkan* disease and *Bunchy*-top disease, affecting banana plants.

In the next section, a short review of the literature on crop insurance is given.

2. Review of Literature

Premium rate is the definite amount payable to the insurers by the insured for the insurance protection offered to him. It is equal to the average of the indemnities paid to the farmers over years for a unit cropped area (Botts and Boles, 1958).

Dandekar (1976) suggested that crop insurance should be linked with credit on a compulsory basis. He found that the crop insurance scheme offered insurance against a chance occurrence. The chance phenomenon underlying a crop insurance scheme is the fluctuations in the output of a crop from one year to another or from one crop season to another.

According to Chandrakanth and Rebello (1980), crop loss due to drought, excessive rains, pests, and diseases may be included in the hazards to be insured. They also remarked that if the entire crop is lost during the planting stage, the indemnity payable should cover the costs up to that stage. Another observation was that crop insurance should be made compulsory at least for all borrowers. In this case the insurance premium must be included in the crop finance.

Hogen (1982) stated that crop-credit insurance for farmers might be effective in stimulating adoption of new and risky technology in agriculture.

Subrahmanian (1984) suggested that premium rates have to be revised annually based on the cost of cultivation and the long-term average yield. In India, coverage is taken as a percentage of the long-term average alone. But it would be better to arrive at the coverage level based on cost of cultivation and price per unit of output in addition to the long-term average yield.

Dandekar (1985) noted that the crop insurance scheme is based on the area approach and that a *taluk* / *tehsil* is taken to be the area. Indemnities payable to farmers in the area are assessed on the basis of the average yield for the area; the variations in the yield within the area are neglected. This method is considered unsatisfactory.

Pathak (1986) argued that through crop insurance, farmers could purchase the right for compensation by paying only a small amount and that they are assured of protection against uncertainties.

According to Rustagi (1988), the pre-requisite to effective demand for crop insurance is the farmer's consciousness of risks arising from crop damage, namely exposure to risk. The degree of consciousness varied depending on the type of farm, size of farm, and environmental condition of the farm.

Merrit (1987) stated that regardless of whether crop production is government-sponsored, or originated with a private agricultural lender, the use of a crop insurance option increases the probability of repayment of loans. It is to the advantage of the lender to require the

collateral – the expected yield – to be insured thereby guaranteeing repayment of the loan. It was to the advantage of the farmer-borrower that he insures his crop when he takes an operating loan so that if a production loss should occur the insured will not be forced to choose between repaying the loan out of other resources or going out of business.

In the view of Ray (1987), to be most effective, it needs to be a tripartite operation, i.e., a co-operative endeavour among farmers, who are its primary beneficiaries, the government and the general community, the last two having a close interest in a sound agricultural economy. This is quite different from the usual insurance of a commercial nature, in which there are essentially two parties, the vendor and the comparator of service i.e., the insurance agency.

Toyoji (1987) has suggested three approaches to crop insurance. The initial approach is the study of demand of small-scale farmers for crop insurance in relation to their income and possibility of exposure to natural hazards. This information would provide an important insight into the formulation of a crop insurance scheme, which is sufficiently attractive even to the small-scale and low-income farmers. The second approach is to consider a suitable administrative organisation that would oversee the implementation of the scheme at all levels. The third consideration pertains to the technical procedures for crop insurance such as insurance unit, amount of coverage, and premium rate.

Crop insurance may be classified into area insurance and individual insurance. The former means that a certain area is determined as a unit of insurance. For example, each subdivision of a district may be determined as an insurance unit. The individual insurance means that the insurance unit is the individual farm. Indemnity will be paid to the insured individual in case of crop failure. The unit of insurance may be further divided into farm-unit insurance and plot-unit insurance.

The determination of the amount of coverage per unit area is very important and equally difficult. In the Japanese crop insurance programme, the coverage is expressed in terms of money per unit area.

The premium rate is determined based on the statistical data on yield and planted area of crop to be insured, land revenue, and grants of emergency relief in the area to be insured. If the damage to the crop to be insured is classified by the extent of damage each year, the damage rates each year may be defined as follows:

$$\text{Damage rate} = \frac{\text{Damage acreage converted into complete loss}}{\text{Total planted acreage}} x100$$

If the statistics obtained are amount of loss of the crop to be insured, the damage ratio will be according to the following formula:

$$\text{Damage rate} = \frac{\text{Amount of loss}}{\text{Normal yield X Total planted acreage}} x100$$

Jorge (1987) opined that the appraisal of loss is one of the momentous aspects of insurance. Moreover, in the case of crop insurance, a rapid loss adjustment procedure is essential. Since the farmers will wish to harvest the undamaged part of the affected crop in due time, it is necessary to set up and train an adequate number of local adjustment personnel capable of responding immediately to appraise losses. Since crop insurance is characterised by a very high degree of risk, it is risky for a primary organisation to bear an excessive insurance liability accepted from farmers. Therefore, the insurance carriers should be willing to spread their risk. One option is reinsurance.

Crop insurance programme whether for an advanced or a developing country, cannot be designed without scarifying some of the preceding rigid requirements. The dearth of accurate and sufficient data regarding crop yield and losses in most developing countries compounds the problem in crop insurance design.

Mutual aid schemes fit precisely with all insurance programmes as a mutual aid endeavour. While crop insurance in the present form, especially all-risk crop insurance, was contemplated and initiated in the first half of the twentieth century essentially through government effort in both Japan and USA, primarily as a matter of public policy, in both the countries the emphasis on mutuality at farm level was quite clear. Especially in Japan, crop insurance has been operated largely as a mutual aid institution. The concept of mutual aid has obvious impact on the basic principles and practices of crop insurance. What distinguished crop insurance from pure mutual aid or mutual relief or public relief in the case of large-scale crop disasters is the link up between the actuarial techniques and the principles and operation of mutual aid. The actuarial technique is the application of appropriate statistical methods to determine certain behavioural patterns out of what seem to be *prima facie* irregular and unrelated happenings, for instance, the occurrence of drought or flood or insect infestations of crops or the extent of crop losses resulting therefrom (Ray, 1987).

3. Crop Insurance Schemes and KHRDP: An overview

Crop insurance schemes have evolved throughout the globe in different shapes and with different degrees of operational dynamism. A modest attempt is being made in this section to review a few crop insurance schemes elsewhere in the world, in India, and the crop insurance scheme of Kerala.

Crop insurance schemes are implemented by a large number of countries in different parts of the world. Some of the schemes are briefly reviewed in the following section.

Crop insurance schemes in Asian countries

Sri Lanka has had a nation-wide rice insurance scheme for the past three decades; it has now begun experimenting insurance on cotton and other food crops and also on livestock. The administrative cost is borne by the government and an Agricultural Insurance Board implements the programme. In addition, crop insurance is a pre-requisite in Sri Lanka for securing institutional credit for the production of rice, other crops and livestock. Thailand initiated its first Agricultural Insurance Scheme for cotton, on an experimental basis in 1978 in co-operation with 13 local insurance companies. By 1982, the Department of Agricultural Extension began implementing the crop insurance schemes for cotton, maize, and soya beans, in six of the provinces of Thailand. The Philippines initiated in 1976 some effort at crop insurance through the Land Bank of the Philippines. In two years, the Government created the Philippines Crop Insurance Corporation (PCIC) under the Ministry of Finance with 12 regional offices operating throughout the country. The PCIC has been in operation since 1981 for giving insurance to rice and other crops of farmers participating in the Government-supervised credit programme, on a compulsory basis. Indonesia took serious steps to establish a crop insurance scheme with assistance from FAO in 1980. The Republic of China has had livestock insurance scheme in 1963, though agricultural insurance was implemented only since 1983. Malaysia formed a National Task Force on Agricultural Insurance in 1985 through the Malaysian Insurance Industry Association to plan, co-ordinate, monitor, and evaluate the implementation of a crop insurance programme. The Republic of Korea is not only active in preparing for the adoption of a National Crop Insurance, but has actually passed two laws pertaining to natural disasters. (1) compensation against agricultural loss, and (2) protective measures against typhoon and flood.

Japanese Agricultural Insurance Scheme

Japan evolved its prevailing Agricultural Insurance Scheme through a period of 50 years and now is the world's largest reckoned in terms of the number of farmers insured. Japan is one of the few countries in Asia in which a crop insurance scheme is in operation on a nation-wide basis. The Japanese scheme originated from the Agricultural Loss Compensation Law enacted in 1947, one of the major reforms enacted during the period immediately following the World War II. The law of 1947 was not, conceptually speaking, an entirely new idea. Buffer stock for staple food, mutual relief among farmers, tax reduction on rents to tenants under bad harvest conditions and so on had been ideas in practice in many localities even

during the pre-Meiji restoration period, the period prior to 1868. Based on those traditions of the rural areas and political efforts by agricultural leaders, the Livestock Insurance Law was implemented in 1929 as the first nation-wide insurance legislation. Followed by this law, the Agricultural Insurance Law came into effect in 1939.

The Agriculture Loss Compensation Law of 1947 was the outcome of these two laws of 1929 and 1939. The other two laws implemented during the period were the Agricultural Land Reforms Law of 1946 and the Agricultural Co-operative law of 1947.

The major goals of the Agricultural Loss Compensation Law were the following:

(i) To protect all farmers, including those in marginal production areas, from the economic losses caused by natural hazards and thus to enable them to maintain production power even after agricultural damages occurred;
(ii) To sustain and protect the gains made by the Land Reform Programme, i.e. there was particular need to help the farmer-tenants who lost their patrons (landlords some times allowed deferred payment of rent or provided the emergency needs) and farmers who were in danger of stepping back to tenant status consequent on crop damages; and
(iii) To secure staple food supply for the nation by protecting the secured agricultural bases of small farmers.

The essential features of the Japanese scheme may be summarised thus:

a. Implementation of the programme is compulsory as regulated by laws and ordinances;

b. Farmers' participation is compulsory;

(i) A large amount of government subsidy is provided not only for office expenses but for premium payment as well; and
(ii) The government conducts reinsurance business in order to carry out the insurance programme smoothly.

The basic unit of farm operation in Japan is essentially the owner-operated family-farm, where the greater canal and the labour resources are owned and provided by the farm family. The land reforms programme implemented after the World War II distributed approximately two million hectares of agricultural land to the farmer tenants and reduced the ratio of tenanted land to the total acreage from 46 percent to 10 percent and the ratio of tenant farmers to all farmers from 28 percent to 5 percent. The reform successfully established a system of owner-cultivation. In addition, the traditional unit of farming has been the family farm, the corporate farms occupying only less than one percent of all farms. Small-scale cultivation is another important characteristic of Japanese agriculture. In 1983, the average cultivated area per farm household was 1.20 ha. Part-time household farming is also mentioned as the characteristic of present Japanese rural life. In 1980 nearly 75 percent of the total family income came from off-farm sources. With the increased demand for non-farm industries for rural labour force, more and more farm families have taken to off-farm

employment, while small-scale rice farming persisted. Development and diffusion of modern labour-saving technologies in rice farming has accelerated this trend.

The Japanese Agricultural Insurance Scheme has essentially no direct linkage with formal credit institutions, as is the case in other developed countries such as United States, Canada, and Sweden. The following points were accepted, in general, to justify crop insurance scheme.

(i) In agriculture, since natural disasters occur accidentally in terms of location or time, technical difficulties are involved in the implementation of risk dispersion. Furthermore, when catastrophic losses continue in a wide area, indemnity would be too large to be paid by a private insurance scheme;
(ii) In other industries, gross revenues under production plans could be estimated, while in agriculture, there exist wide variability both in yield and product price, a fact, which makes income estimation quite shaky and difficult. Monetary losses arising from such unpredictability hit small farmers most who do not have alternative income sources;
(iii) In order to secure a minimum required amount of food domestically, the production power of the farmers has to retained.

Organisation of the scheme

Japanese Agricultural Insurance programme is administered through a decentralised three-tier structural system. They are Agricultural Mutual Relief Associations (or Association) at village or municipality level, Federation of Agricultural Mutual Relief Associations (or Federation) at the prefecture level and the Agricultural Mutual Relief Re-insurance Special Account of the National Government.

In addition to these three tiers the Agricultural Mutual Relief Fund was established since the 1960s, as an insurance credit facility for the Federations. Furthermore, the National Agricultural Insurance Association (NAIA) was established as a corporate judicial body, comprising all federations. The main activities of NAIA are to make lobbying, to conduct research, to carry out publicity and to conduct training courses on agricultural insurance programmes.

Two important points to be emphasised in this context are: the deep commitment of the government, (the government not only pays the majority of the office expenses of the Association and the Federation but also subsidises a significant part of the net premium and exercises reinsurance responsibility); the decentralised structure of the Japanese system, each Association carrying out most of the insurance operations at the lowest level itself.

The Association is an organisation established in each locality (village, town or city), with all the farmers in the locality whose planted acreage exceeds a prescribed minimum area. In this sense, the Japanese agricultural insurance scheme is compulsory in nature. The Association is basically responsible for the entire agricultural insurance operation at the lowest level, i.e. to make mutual relief contracts, to collect premium from the insured, to make loss assessment, to pay indemnities, and to provide the farmers with loss-prevention guidance. The Association

also has an autonomous function. They elect the leader of the Federation, communicate their needs to the higher levels, retain some portion of the premium collected in the form of deposits and carry out loss-preventing activities of their own.

The Federation was established in each prefecture in order to engage in an insurance business in the prefecture. All associations within the boundary of a prefecture automatically become members of the Federation. The Federation takes some part of insurance responsibility with the Association, when Associations cannot fully cover the risks within their areas. Also, the Federation gives guidance on request to the Associations on matters concerning control of insects and diseases and carries out loss assessment.

In the United States, it took 150 years to develop crop insurance to its present level. The Federal Crop Insurance Act was passed by Congress and the Agriculture Adjustment Act created the Federal Crop Insurance Corporation (FCIC), both in 1938. Wheat insurance was started in 1939, followed by cotton insurance in 1942. In 1980, the Congress passed an act to enable FCIC to tap resources of private insurance companies through reinsurance operation. The Crop Insurance Act of 1980 provides the opportunity to insure every principal crop that is actuarially discoverable.

Crop insurance in India

The question of introduction of a crop insurance scheme in India emerged soon after independence in 1947. Following the assurance given in this regard by the Ministry of Food and Agriculture in the central legislature, a special study was commissioned in 1947-'48. The study reported in favour of a homogenous-area approach against individual approach even as various agro-climatically homogenous areas were being created as units and the individual farmers in such a unit paying the same rate of premium and receiving the same amount of benefits, irrespective of their individual fortunes. In 1965, the Government introduced a crop insurance bill and circulated a model scheme to the State governments. On receiving the reactions from the Sate governments, the subject was referred to an expert committee in 1970, for detailed examination of its economic, administrative, financial, and actuarial implications. In 1972-'73, the General Insurance Department of the Life Insurance Corporation of India introduced a crop insurance scheme on H-4 cotton. During 1973-'76, this scheme was confined to six states and it generated a claim ratio of more than 1060 percent; it was therefore discontinued. Against the background of this experiment, a study conducted by Prof. V.M. Dandeker, recommended a scheme based on homogenous-area approach, which was to be linked with crop loans. A pilot insurance scheme was introduced in 1976 based on this recommendation. The number of States and the number of crops covered increased over time. The results of the pilot insurance scheme were analysed to study its progress. The government appointed a high-level Inter-ministerial Committee in 1981 in association with experts to go into the question of long-term crop insurance to be introduced with the commencement of the Seventh Plan. The Committee reported in 1983. After the consideration of the report and the analysis of the performance of the pilot scheme and several other related aspects in the matter, the government took the view that crop insurance would be a valuable support to the agricultural economy and a useful programme to stabilise and boost agricultural production. The initiative already launched should not only

be continued but also extended and widened in scope keeping in view the broad objectives of the Seventh Five-Year Plan that was to commence form 1985.

Comprehensive Crop Insurance Scheme (CCIS)

The Government of India introduced in April 1985 the comprehensive crop insurance for loanee farmers with the following objectives:

(i) To provide a measure of financial support to farmers in the event of a crop failure as a result of drought, flood, etc;
(ii) To restore the credit eligibility of farmers, after a crop failure, for the next crop season;
(iii) To support the production of cereals, pulses, and oil seeds.

The risk coverage was to be shared between the General Insurance Corporation (GIC) and the State Governments concerned in the ratio 2:1.

The participation in the scheme was voluntary and the States were free to opt for the scheme. All farmers who avail crop loans from Commercial banks, Regional Rural Banks and Co-operative banks for growing wheat, rice millets (including maize), oil seeds, and pulses were eligible for insurance coverage under the scheme. The sum insured was equal to the crop loan disbursed, subject to a maximum of Rs 10, 000 per farmer. The premium payable was two percent of the sum insured for wheat, rice, and millets and one percent for oil seeds and pulses. The Central and State Governments subsidized 50 percent (with equal contributions) of the premium payable by small and marginal farmers. From 1985 onwards till 1998-'99, 19 States, and 4 Union territories implemented the scheme in one season or in more than one season.

The performance of the scheme during the past five years may be understood from the figures given in Table 3.1

Table 3.1 Performance of CCI Scheme

Year	Farmers covered (Rs Lakh)	Total Ins. Charges	Claims paid (Rs Lakh)	Claim ratio
1994-95	5187198	2970.90	5793.40	1.95
1995-96	5657739	3433.03	14867.37	4.33
1996-97	5846985	3935.20	17151.02	4.36
1997-98	6001199	4147.58	17128.59	4.13
1998-99	6197585	4635.24	3543.69	0.76

Source: Annual Report: 1999-2000, Dept. Agri. & Co-operation, M/o Agri., GoI.

It is seen that the claim ratio was higher than one for the entire period except for 1998-'99. The overall claim ratio was 3.06. This high claim ratio indicates that the scheme causes high financial burden to the government. For an insurance scheme to be financially viable the claim ratio should be kept below unity. The scheme could be modified with State assistance by cushioning the financial burden to the government to a narrow margin above unity. But it is obvious that a claim ratio of a magnitude of three and above is not sustainable. The scheme was frozen in 1998-'99 for administrative reasons and the claim ratio fell to below unity. Obviously, it was not due to the increase of the insured amount beyond the indemnity amount.

A comparative study of financial performance of crop insurance schemes conducted by Jerry Skees, *et al*, in 1999 showed that the maximum ratio of indemnity to premium among the seven countries under the study was the highest in India.

Table 3.2 Financial performance of crop insurance scheme in seven countries

Country	Period	Indemnity: Premium Ratio
India	1985-89	5.11
Brazil	1975-81	4.29
Costa Rica	1970-89	2.26
Japan	1985-89	0.99
Mexico	1980-89	3.18
Philippines	1981-89	3.94
USA	1980-89	1.87

Source: EPTD Discussion paper No. 55, November 1999

The following drawbacks were identified for the CCIS:

(i) The crop insurance scheme covers only loanee farmers leaving the majority of the farmers uncovered;
(ii) The scheme covers only a limited number of crops;
(iii) The limit of sum insured is too low (Rs 10,000 per ha.) to cover the input cost;
(iv) Low flat premium rate and resultant high claim ratio made the scheme practically unviable;
(v) The unit of insurance is too large to reflect actual crop losses.

National Agricultural Insurance Scheme

Considering the demands of the farming community and States/ Union territories, the Government of India decided to implement a new scheme in the place of CCIS, called National Agricultural Insurance Scheme (NAIS) - (*Rashtriya Krishi Bima Yojana*) from Rabi 1999-2000.

The scheme is available to all the farmers both loanee and non-loanee, irrespective of the size of their holdings. It envisages coverage of all the food crops (cereals, millets, and pulses), oil

seeds, and annual commercial/ horticultural crops, in respect of which past yield data are available for an adequate number of years. Three cash crops, i.e. sugarcane, potato, and cotton will be covered in the first year of its operation. All other annual horticultural and commercial crops will be placed under insurance cover within the next three years subject to the availability of past yield data.

The premium rates are 3.5 percent of the sum insured for bajara and oil seeds, 2.5 percent for wheat, and 2 percent for other Rabi crops. In the case of commercial / horticultural crops, actuarial rates will be charged. Small and marginal farmers will be entitled to a subsidy of 50 percent of the premium charged on them, which will be shared on 50:50 basis by the Central and the State Governments. The premium subsidy will be phased out over a period of five years.

The new scheme would operate on the basis of Area approach, i.e., defined areas for each notified crops for widespread calamities and on individual-basis for localised calamities such as hailstorm, landslide, cyclone, and flood. Individual-based assessment in case of localised calamities would be implemented initially in a few areas, on an experimental basis, and shall be extended in the light of operational experience gained. Under the new scheme, each participating State / Union Territory will be required to reach the level of *Grama panchayat* as the unit of insurance in a maximum period of three years.

The Government has also decided to set up, in due course, an exclusive organisation for implementation of the new scheme in due course. Until such time the new set-up is created, the General Insurance Corporation of India will continue to function as implementing agency. The total outlay of the Ninth Five-Year Plan period for Crop Insurance is fixed at Rs 730 crore. During first two years i.e., 1997-'98 and 1998-'99 Rs 110 crore were released annually to the GIC for implementation of the scheme. A revised estimate of Rs 208 crore was kept for implementation of Crop Insurance during 1999-2000.

Strengths of NAIS

(i) All farmers including loanees, non-loanees, sharecroppers, and tenancy farmers covered under the scheme;
(ii) Additional crops covered under the scheme including annual, commercial, and horticultural crops;
(iii) Limits of the sum insured removed;
(iv) Premium rate rationalised according to the crop;
(v) Unit area reduced to *panchayat* level;
(vi) Localised calamities also brought into the purview of coverage; and
(vii) Direct acceptance from non-loanee on experimental basis.

Insurance for horticultural crops

In India, crop insurance schemes in various forms are being implemented since 1972. However, insurance of horticultural crops is only a recent development. The horticulture insurance schemes currently implemented may be classified under two heads.

(i) Schemes implemented with governmental support;
(ii) Schemes implemented without governmental support.

Schemes implemented with governmental support

The GIC is operating, on behalf of the Government, the National Agricultural Insurance Scheme (NAIS) with effect from Rabi 1999-2000 season. The scheme, besides food crops and oilseeds, also covers annual, commercial, and horticultural crops. However, during the first year only potato was covered under annual horticultural crops; all other crops under the group are expected to be covered by the third year (subject to availability of past yield data and ability of the concerned State to conduct the requisite number of crop-cutting experiments for furnishing information on average yields). For the second year, onion, chilli, turmeric, and ginger have already been included. Its salient features are:

(i) The scheme is available to all States/ Union Territories;
(ii) It covers all farmers, including share-croppers and tenant farmers. Loanee farmers are covered on compulsory basis, while non-loanee loans are covered on voluntary basis;
(iii) It is an all-risk insurance, covering all losses due to natural and non-preventable risks;
(iv) Sum insured may extend up to a value of 150 percent of the average yield. In the case of loanee farmers, the sum insured is equivalent to at least 100 percent of the loan amount availed for the crop;
(v) Premium rates are charged on commercial lines (actuarial basis) and are worked out every season in every State;
(vi) Small / marginal farmers are eligible for premium subsidy at the rate of 50 percent, which is to be phased out on sun-set basis in a period of 3-5 years subject to review of financial results;
(vii) It is a yield-guarantee scheme operating on Area-approach basis. If the actual average yield /ha of the insured crop for the defined area (on the basis of requisite number of crop-cutting experiments) in the insured season, falls short of the specified threshold yield, all the insured farmers growing that crop in the defined area are deemed to have suffered shortfall in their yield and the scheme seeks to provide coverage against such contingency;
(viii) Implementing agency (GIC) shall bear all claims up to 150 percent of the premium in the first three or five years and 200 percent of premium thereafter. All claims beyond the liability of GIC shall be paid out of a Corpus Fund; and
(ix) To meet claims of annual commercial / horticultural crops beyond the liability of GIC, a Corpus Fund is created with contributions from Government of India and participating states on 50:50 basis.

Schemes by public sector insurance companies sans government support

Separate Horticulture and Plantation Insurance Schemes are operated by four Subsidiary Companies of GIC, viz., National Insurance Co. Ltd., The New India Assurance Co. Ltd., The Oriental Insurance Co. Ltd., and The United India Insurance Co. Ltd. The development of hybrid varieties, availability of technical know-how, financial support from financing

institutions, government subsidies and attractive profit margins due to ever-increasing demand for horticultural produce, have all contributed to the growing importance of horticulture plantations in India. Hence, these insurance schemes have become important for horticultural crops.

Horticultural and plantation crops covered by subsidiary companies under these schemes are the following:

Horticultural crops

Grape, Citrus (Orange, lime, sweet lime), Sapota (chickoo), Pomegranate, Banana, Apple

Plantation crops

Rubber, Eucalyptus, Poplar, Teak wood, Oil palm, Coconut

The following insurance coverage is given for floriculture

(i) Marine transit cover at the time of import of plants / saplings / seed material.
(ii) Floriculture Insurance (Inputs) Policy for the plants in nursery/ greenhouse/ field.

Salient features

The salient features of the horticultural/ plantation insurance scheme include the following: The policy is issued to cover losses or damages due to:

(i) Fire including forest fire and bush fire; Lightning;
(ii) Acts of terrorism committed by a person or persons acting for or in connection with any organisation**;**
(iii) Storm, hailstorm, cyclone, typhoon, tempest, hurricane, tornado whilst in direct and immediate operation;
(iv) Riot and strike; Flood and inundation; and Wild animal attack (in case of banana). For grapes, insurance coverage is given for damages caused by frost and unseasonal rain.

Eligibility

(i) Individual farmer, whether owner or tenant engaged in cultivation of the crops mentioned above;
(ii) However, a policy may be issued in the name of an association or an organised and registered body of farmers engaged in cultivation of the specified crops where such association/ body has been formed and is functioning for the purpose of procurement of input processing / marketing of the produce and / or any other as recorded in schedule (to be attached to and forming part of the policy) in a manner that, in the event of loss, claims can be assessed and settled on individual basis;

Period of insurance

For fruit crops the policy is valid for one season only. The policy period is taken from the date of payment of premium until crop in that season is harvested. The policy ceases after harvesting in the season for which the policy is issued. For crops with more than one year gestation, appropriate additional premium will be charged. For citrus, the policy period will be one year from the date of issue of policy. For nursery, floriculture, and plantation crops, policy is for one year from the date of issue or for the end of the season whichever is earlier.

Premium rates

The premium rates chargeable to different horticultural crops are given in Table 3.3.

Table 3.3 The premium to be charged for different insurable crops

	Horticultural crops	
a)	Fruits	5.00 % of sum insured
	Citrus fruits (orange, lime, sweet lime) Sapota (chickoo), pomegranate, banana (standard cover)	
	Grape (Optional cover: losses due to unseasonal rains and frost)	Additional premium @ 1.50 % of sum insured
b)	Plantations	
	Rubber, eucalyptus	1.25% of sum insured
c)	Sugarcane	1.25% of sum insured
d)	Oil palm	2.00% of sum insured

Sum insured

The sum insured is fixed on the basis of the cost of inputs, i.e., the expenses incurred on raising the crops. The items included in the cost of inputs are the following:

Pruning and trimming, tillage, de-weeding, de-trashing, planting/seeding, application of fertilisers and manures, maintenance of soil structure and plants, application of pesticides and insecticides, watering plants, spraying of micro-elements, using synthetic hormones, plant protection and labour charges for the above.

In case of tree plantations such as rubber and eucalyptus the input costs right from the first year have to be considered. The sum insured is reduced by the amount of the claim paid. This reduced sum insured will be considered for subsequent losses and payment of claims accordingly.

Franchise

No claim shall be payable under the policy if the amount of claim assessed does not exceed

10 percent of the sum insured per acre or Rs 1,000 per affected acre whichever is lower. This franchise clause is not applicable for fire losses under the Sugarcane Policy.

Important exclusions

Theft; war and such other events; nuclear risks; earthquake; insects, pests and diseases; drought; high humidity; frost or cold waves; rain water, where the rains occur independently of the immediate and direct operation of the insured peril; pollution; and delay in the onset of monsoon

Loss assessment method

It should be clearly noted that the expenses incurred during the season, for which the policy has been issued, only are to be taken into account for the purpose of the policy. Expenses made prior to the season in question are not to be considered. Expenses made on specific items under the cost of cultivation only are covered. For the purpose of indemnity, the policy is a valued policy and no statement of accounts of actual expenses incurred is required to be submitted by the insured. Expenses from the previous harvest till the date on which the insured peril operates only should be taken into account as having spent for the purpose of the claim. Hence the claim cannot in any case be more than this amount.

For calculating this amount sliding scales of inputs are prepared and attached to the policy as inputs clause. This input clause for each crop is separate. The percentages given in the input clause have to be applied on the sum insured stated in the policy. The amount of claim payable under the policy shall be such sum which is arrived after applying the percentage of the loss of yield to the amount of the cost of inputs at the stage at which the insured perils causing the loss of yield operates, subject to the franchise, excesses, and deductions.

Important policy conditions

This policy is issued on input cost basis only; no other expenses/ costs are indemnifiable. Failure to intimate the claim forthwith will forfeit all rights and benefits under the policy. If the insured has more than one acre of horticultural crop in any one location, he is expected to insure all of them, failing which, if a claim arises, the same will be settled in the proportion the insured acreage bears to total acreage.

Claim Experience

The major crops covered under the plantation and horticultural crops are banana, grape, and rubber. During the period from 1993-'94 to 1998-'99 (6 years), the premium collected under horticultural and plantation Insurance Schemes amounted to Rs 18.18 crore as against which the amount of claims paid was Rs 18.14 crore (Table 3.4).

Table 3.4 Year-wise premium amounts and claims, 1993-'94 – 1998-'99 (Rs in lakh)

Year	Premium amount	Incurred claims amount	Claim ratio(%)
1993-'94	131.19	176.37	134.44
1994-'95	242.27	233.68	96.45
1995-'96	253.00	207.95	82.19
1996-'97	288.33	215.02	74.57
1997-'98	475.60	557.93	117.31
1998-'99	427.62	422.91	98.90
Total	1818.01	1813.86	99.77

KHDP insurance for banana

Banana plants of all varieties cultivated by farmers are covered by the Kerala Horticulture Development Programme (KHDP) with credit support from the participating banks, under this insurance package.

Insurance cover is provided against total loss or damage to banana plants due to fire, lightning, flood, inundation, heavy wind, cyclone, storm, landslide, rockslide, tornado, drought, frost, riot and strike, pseudo-stem-borer attack and *kokkan* disease. The insurance cover will expire after 12 months from the date of planting or harvest or by 12 months form the date of receipt of premium whichever is earlier in the case of all varieties except red banana. For red banana the period is 14 months.The premium is Rs 1.90 plus service tax of 10 paise per plant. The policies issued under the agreement will be in force from the date of receipt of premium at the Divisional Office of New India Assurance Co. Ltd (NIA).

Table 3.5 Compensation payable in case of crop loss

Month after planting	Compensation payable per plant in the event of loss or damage	
	***Nendran* & Red Banana**	**Other varieties of banana**
1 Month	No claim	No claim
2 to 4 months	Rs 30	Rs 30
5th month to before emergence of bunch	Rs 40	Rest. 40
After emergence of bunch and propping of the plant	Rs 60	Rs 50

(i) Propping is a must for banana from the 6th month or the emergence of bunch.

(ii) A salvage value of Rs 10/plant shall be deducted if the plants are of at least 8 months of age from the date of planting and will be applicable to *Nendran* variety of banana only;

(iii) In the case of flood and wind damage, insurance company will bear only 75 percent of the assessed loss (as per variation table) and the farmers will bear the rest.

(iv) In the case of *Kokkan* and pseudo-stem-borer attack, only 10 percent of the total insured plants or the actual number whichever is less, will be eligible for compensation. Compensation will be payable only once in a policy period for damages due to *Kokkan* and pseudo-stem-borer.

Procedure for operating the scheme

The farmer shall submit the details of plants to be insured, in his proposal-cum-application in triplicate. The branch office of the insurance agency would send the premium statement duly filled in to NIA together with a copy of the proposal-cum-application and the amount of premium by way of demand draft /pay order. The amount of premium shall be debited to the farmers account on the date of issuing demand draft.

Risk commences from the date of receipt of premium at NIA. NIA will issue an acknowledgement and endorsement number.

Procedure for claim settlement

(i) In the event of crop loss, the farmer immediately informs the financing agency and the KHDP officials, the cause of damage, the number of plants damaged, and the age of plants;

(ii) The farmer has to fill up the claim forms and submit them to the branch of the financing agency;

(iii) Joint assessment will be done by the branch and KHDP;

(iv) Joint inspection report has to be prepared by bank and KHDP and sent to NIA (If the total number of plants lost exceeds 300, branch shall send the claim form and joint inspection report immediately to NIA asking for survey by an independent surveyor)

(v) Insurance company will settle the claim;

(vi) Voucher for the claim amount will be sent to the branch;

(vii) Voucher to be retransmitted to NIA duly signed by farmer and bank;

(viii) The claim amount will be sent to the branch.

Exclusions

(i) Loss or damage prior to the date of commencement of risk; Theft, loss of yield / due to non-bearing of plants; Pests and diseases; Wilful negligence; Improper maintenance; Loss after maturity; Natural mortality; Acquisition of land; Plants without props after the emergence of bunch; and Ratoon crops.

Other important details

(i) The survey number furnished in the declaration should tally with that in the claim form, in the absence of which, claim will not be payable.

(ii) Drought under this policy means drought as declared by Indian Meteorological Department or by Revenue Authorities, Government of Kerala

Difficulties experienced

(i) Survey numbers in the claim form do not tally with those stated in the original declaration.
(ii) Additional survey numbers written in the claim form, not mentioned in the original declaration.
(iii) Survey number not written in the claim form / declaration.
(iv) Endorsement number not written in the joint inspection report.
(v) Declaration signed by the insured at the time of taking insurance not given.
(vi) Name of the farmer differs in the claim form and declaration.
(vii) No signature of Bank / KHDP Official in joint inspection report.
(viii) Incomplete claim form.

State crop insurance scheme

In Kerala, the State Crop Insurance Scheme was started in 1995. The programme is intended to compensate at least in part for the losses and damage caused by natural calamities. To realise the scheme, a crop insurance fund was formed by the Department of Agriculture. The insurance scheme covers all the major crops of Kerala. The details of the crops and the premium fixed for insurance of each crop are given in Annexure I.

The features of the State Crop Insurance Scheme are the following.

Calamities

Crop losses caused by the following natural calamities are covered. Drought, Flood, Landslide or Landslip or Landfall, Encroachment of sea, Tornado, Storm, Lightning, Forest fire, and Attack of Wild Elephants.

The scheme does not cover any of the crop losses or damages due to pest and disease infestation. Damages caused by wild elephants are included for rural areas of Thiruvananthapuram, Kollam, Pathanamthitta, Idukki, Ernakulam, Thrissur, Palakkad, Malappuram, Kozhikode, Kannur and Wayanad. Insurance coverage is given to rice farmers who had insured through group farming *samithis*, for crop losses due to pests and diseases.

Premium rate

(i) The farmer should remit the premium rate determined by the Government. This amount will not be reimbursed.
(ii) The insured shall be eligible for crop loss caused after seven days of remittance of premium.

Indemnity

(i) Claims shall be valid only for complete crop loss caused by the factors mentioned above;
(ii) The price of the damaged crop, if any, shall not be deducted from the indemnity;
(iii) A part of the crop in a field cannot be insured;
(iv) The insured should take every possible effort to minimise crop loss;
(v) The insured shall be given the indemnity fixed by the government from time to time;
(vi) Aged and unproductive tree crops cannot be insured in the programme;
(vii) For crops like ginger, turmeric, groundnut, sesame, vegetables, pulses, tuber crops, cardamom, and betel vine, indemnity shall be claimed, if crops in at least 10 percent of the cropped area are lost due to the calamity;
(viii) The duration of the insurance coverage for short-duration crops shall be from the seventh day of remittance of premium to the date of harvest.

Membership

(1) Farmers cultivating in own land or leased-in land are eligible for membership in this scheme.
(2) The rice farmers shall insure their crop through G*roup Farming Samithis*, but the indemnity shall be provided for individual farmers.

Implementation of the scheme

(i) The scheme is implemented through *Krishi Bhavans* at the *panchayat* level.
(ii) The insured submits the application for the scheme through the concerned *Krishi Bhavan*.
(iii) The *Krishi Bhavan* official visits the field and determines the premium rate.
(iv) The determined premium rate is collected through an agent and deposited at the District Co-operative Bank.
(v) The agent is selected by the Agricultural Officer from among the young farmers from each *panchayat* ward.
(vi) The agent remits the premium and submits the receipt to the *Krishi Bhavan*.

Crop insurance fund

The Crop insurance fund consists of

(i) The amount deposited by the State Government
(ii) The amount collected as premium from the insured; and
(iii) The interest accrued from the fund.

Operation of fund

The Director of Agriculture opens an account in the State Co-operative Bank and the Principal Agricultural Officers (PAO) in the District Co-operative Banks. The premium collected by

the agents is transferred to the PAO's account before the first day of the succeeding month. If the amount in the PAO's account exceeds Rs 50,000, it is transferred the same day to the accounts of the Director of Agriculture.

Formalities for claiming indemnity

(i) The claim should be submitted to the *Krishi Bhavan* within three days of the casualty.
(ii) The damaged crop should be retained as such till the *Krishi Bhavan* staff visits the field for perusal.
(iii) The *Krishi Bhavan* staff should visit the field and determine the indemnity within five days of receipt of the claim and should send the report to the Principal Agricultural Officer.

Limit for recommending indemnity

1. Agricultural Assistant	:	Up to Rs 500
2. Agricultural Officer	:	From Rs 501 to Rs 3000
3. Asst. Director of Agriculture	:	From Rs.3001 to Rs 10,000
4. Deputy Director of Agriculture	:	From Rs10001 to Rs 50,000
5. Principal Agricultural Officer	:	Above Rs 50,000

Power for sanctioning the indemnity

1. Principal Agricultural Officer	:	Up to Rs 10000
2. Director of Agriculture	:	Rs. 10001 to Rs 25000
3. Administrative Committee	:	Above Rs 25000

Administrative committee

The Administrative Committee shall consist of the Secretary, Department of Agriculture (Chairman), Additional Director of Agriculture (CP) (Convener), Director of Agriculture, Registrar of Co-operatives, State Insurance Director, and Managing Director of State Co-operative Bank.

Compensation

The indemnity will be issued in the form of cheque by the concerned *Krishi Bhavans.*

Collection of premium

The incentives for *Krishi Bhavan* staff and agents for the collection of premium is fixed by the Government as 10 percent of the total premium collected. The distribution of the incentive will be as follows.

1. Agent	:	8 percent

2. Agricultural Assistant : 1.5 percent
3. Agricultural Officer : 0.5 percent

A Special Crop Insurance Scheme has been formulated for long-duration crops / tree crops at pre-bearing period.

For banana, varieties such as *Nendran*, *Kappa*, *Palayamkodan* and Robusta were brought under the scheme. The insured should have a minimum number of 10 plants of the age of 1-5 months. The premium was fixed as two rupees per plant (which is supposed to be about four percent of the average return per plant). The compensation payable to the insured farmer is Rs 20 per plant before bunching and Rs 50 per plant with bunches.

4. Study area, Data Collection, and Method of Analysis

The study was carried out in the Wayanad district of Kerala. According to data collected from the Department of Agriculture, Wayanad district received the maximum amount of indemnity paid for any district in Kerala under the insurance programme for banana cultivation. Wayanad is in the High ranges situated at the northern region of Kerala, amidst the Western Ghats. The topography is undulating and consists of high hills and plateaus.

Wayanad district lies between 11^0 26' and 11^0 59' North latitudes and 76^0 26' and 75^0 46' East longitudes. The total geographical area is 2,12,560 ha, which accounts for 5.48% percent of the State total. The district has a cultivable area of 1,00,952 hectares with 1,31,736 operational holdings. It has an average monthly rainfall of 2792 mm.

The district consists of three blocks and 24 *panchayats*, with a population of 7.87 lakh (in 2001), which comes to 2.47 percent of the State total. The male-female sex ratio is unity. The density of population is 369 per sq. km and the literacy rate in the region is 85.52 per cent, 90.28 for males and 80.80 for females. Nearly 17 percent of its population belongs to Scheduled Tribes and 65 percent of the tribe population lives in the high altitude zone. Scheduled Castes come to about four percent.

The major crops of the Wayanad district are of coconut, arecanut, rubber, pepper, banana, cashew, rice, and vegetables. There are also extensive tea and coffee plantations. Spices like ginger, cardamom, and turmeric are also cultivated in the district to a large extent.

Data collection

A multi-stage sampling design was used for sampling. From the three blocks of the district, one *panchayat* each was selected randomly. The *panchayats* selected are listed in Table 4.1.

Table 4.1 Sampling details

Block	Panchayat selected	Sample size (No. of farmers)
Mananthavady	Panamram	40
Sulthan Bathery	Ambalavayal	40
Kalpetta	Padinharethara	40

The list of banana farmers from these selected *panchayats* were collected from the respective *Krishi Bhavans*. This list was used as the sampling frame. The sample selected consists of 40 farmers from each *panchayat*, the total sample size being 120 farmers.

Data were collected in line with the objectives using a pre-tested structured interview schedule. Data on yield, assets of farmers, total cost of cultivation, extent and causes of crop loss, and socio-economic characteristics of the sample farmers were collected.

Secondary data

Data on the yield of banana in Wayanad district were collected from the Department of Economics and Statistics, Thiruvananthapuram for the past 15 years. Data related to the crop insurance scheme were collected from various sources such as Directorate of Agriculture, Thiruvananthapuram, Office of the Principal Agricultural Officer, Wayanad and Krishi *Bhavans* of Padinharethara, Panamaram, and Ambalavayal.

Method of Analysis

Trend analysis

Trends in area, production, and productivity of banana cultivation in Kerala and Wayanad were estimated using the Compound Growth Rate; the functional form employed was:

$Yt = AB^t e^m$
Where, Y is Area, Production, and Productivity of Banana
A is the model intercept
B is the coefficient
t is the time variable
m is the random error.

This was estimated in log-linear form:

$\ln Y = \ln A + t \ln B + m$
where, Compound Growth Rate, g = (anti.ln B –1)

Costs and returns in banana cultivation

The profitability of cultivation may be estimated by finding the relationship between costs incurred and returns realised.

Cost concepts

In farm management studies various cost concepts have been used viz., Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1 and Cost C_2.

1. Cost A_1

Approximate actual expenditure incurred in cash and kind which includes the following items:

Value of hired human labour

Human labour employed for various cultural practices like land preparation, planting,

intercultural work, propping, manuring, plant protection, irrigation and harvesting are included. The actual wages paid for labour is considered the value per unit of hired labour.

Value of planting material (suckers)

The purchased suckers are evaluated on the basis of their purchase price.

Value of manures and fertilizers

Expenditure on purchased quantities of manures and fertilisers is evaluated by multiplying the physical quantities of different manures and fertilisers used, with their respective market prices.

Value of plant protection chemicals

Expenditure on fungicides and insecticides is calculated by multiplying the physical quantities of different fungicides and insecticides used, by their respective market prices.

Cost of propping

Cost of propping is apportioned on the basis of the average number of years for which they are used.

Depreciation on farm implements

Interest on working capital

Interest on working capital is charged at the rate of 11.25 percent per annum.

Land revenue

Miscellaneous expenses

This includes items such as water charges, cost of electricity, farm power, irrigation cost, and other taxes.

2. Cost A_2

Cost A2=Cost A1+ rent paid for leased-in land. Rent paid for leased-in land is the actual rent paid by farmers who had leased in land for banana cultivation. The prevailing rent paid for the land for banana cultivation in the locality (Rs 10 per plant) is taken as the rent for calculation of cost.

3. Cost B_1

Cost B_1= Cost A_1+ interest on fixed capital.

4. Cost B_2

Cost B_2=Cost B_1+imputed rental value of own land. Rental value of owned land is imputed on the basis of the rate prevalent in the region, namely Rs 10 plant.

5. Cost C_1

Cost C_1=Cost B_1+ imputed value of family labour. The actual work done by members of the family on crop production is evaluated on the basis of wage rates prevailing in the locality.

6. Cost C_2

Cost C_2=Cost B_2+imputed value of family labour. The cost of family labour was imputed based on the prevailing wage rates paid to hired labour in the study area.

7. Cost of cultivation

Cost of cultivation is calculated on the basis of the total expenses incurred in cultivating one hectare of banana.

Returns per plant

Average returns per plant were calculated for each *panchayat* and for the district as a whole by taking the outputs in monetary terms. Farm gate price of banana during 1999-2000 (Rs 8.82/kg) was used to estimate the returns. Benefit-Cost Ratios and Net Returns were worked out for each *panchayat* and for the district as a whole. Benefit-Cost ratio has been worked out for Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost $C_{1,}$ and Cost C_2. Similarly Net Returns, which is the difference between the total returns and cost, were also calculated for the different categories of costs.

Sensitivity analysis

In order to identify the extent of vulnerability of farmers to shocks and stresses experienced in banana farming, Sensitivity analysis was undertaken. The net return and the Benefit-Cost Ratios were worked out under the following conditions:

(i) 5 percent reduction in return, costs being the same
(ii) 10 percent reduction in return, costs being the same
(iii) 5 percent increase in the cost, returns being the same
(iv) 10 percent increase in the cost, returns being the same

The results show the risk-bearing capacity of the farmers, a strong determinant of success of any crop insurance scheme (For this analysis, only direct cost [cost A_2] is considered).

Premium rate

An attempt was made to estimate the realistic premium rate using Normal Curve technique (Botts and Boles, 1958). In using this technique, the frequency distribution of yields on individual farms over the area needs to be normally distributed. This is a crucial assumption, which has to be fulfilled to a reasonable extent before this technique can be used. But yield data for the past years of the sample respondents were not realistic. Besides, though the crop insurance scheme was started in 1995, after the second year the scheme was suspended. After the second year of the scheme, enrolment of farmers into the scheme was negligible. This was due mainly to discouragement from the part of the officers functioning in the programme.

In these circumstances, adequate data could not be obtained. However, yield data of banana in Wayanad district were collected from the Department of Economics and Statistics, Thiruvananthapuram. Mean and standard deviations of the yield data were calculated and thus the coefficient of variation was worked out for estimating dispersion of the yield data over years. The negative deviations from the mean were calculated. The average of the negative deviations was taken as the expected loss or risk.

Let the expected loss be 'R'. The percentage of insurance in the locality was estimated from the sample data. Let it be 'P'. 'N_p' is the total number of plants in the area.
Then number of plants expected to be insured, $N_i = (N_p \text{ X } P)/100$
Estimate of expected loss, $E_l = (N_i \text{ X } R)/100$
Let the coverage be 'C'.
Then the indemnity paid to the total area, $I = E_l \text{ X } C$
Premium rate (Rs./plant) = I/ N_i

Constraints faced by the farmers in banana farming

Relevancy rating was employed to evaluate the importance of constraints faced in the implementation of Crop Insurance Scheme in Kerala. The subject experts in the field of agriculture were asked to rate the constraints in a 4-point relevancy continuum viz, *Most Relevant, Relevant, Less Relevant,* and *Not Relevant*. The relevancy Coefficient of i^{th} constraint (RC_i) was estimated using the following equation:

$$RCi = \frac{\text{Total score of all the subject experts in the } i^{th} \text{ constraint}}{\text{Maximum on the continuum X Total Number of experts consulted}}$$

The ranking of the constraints has been done according to it relevancy coefficient so that the constraint having the highest Relevancy rating is ranked 1 and the lowest ranked n, where n is the total number of constraints under study.

5. Performance of State Insurance Scheme

The State Crop Insurance scheme of Kerala was started in1995 and extended in scope and coverage in 1995-'96 and 1996-'97. To begin with, the insurance programme was confined to the banana crop. The scheme is implemented under guidance and direction of the office of the Director of Agriculture.

After the second year the scheme was suspended unofficially. The officials at the grassroots level, the Agricultural officers, were discouraged to implement the programme since it was found to be neither viable nor functioning in line with the objectives of the crop scheme.

About 1.17 lakh farmers had been insured under the scheme till February 2000. Malappuram district had the highest proportion of the insured, 10.84 percent; Thrissur district was a close second with 10.60 percent. The minimum participation in the scheme was in the Wayanad district; 2.18 percent. However, the proportion of population in Wayanad formed only 2.47 percent of the State total. Enrolment in the scheme for all crops is included in the figures in Table 5.1.

Table 5.1 Enrolment of farmers in State crop insurance scheme

Sl. No.	District	Farmers Enrolled		Proportion of District Population to State Population (percent)
		Number	Percent	
1	Thiruvananthapuram	9274	7.93	10.16
2	Kollam	8435	7.21	8.12
3	Pathanamthitta	8415	7.20	3.87
4	Alappuzha	10636	9.09	6.61
5	Kottayam	7076	6.05	6.13
6	Idukki	5029	4.30	3.54
7	Ernakulam	9998	8.55	9.73
8	Thrissur	12402	10.60	9.35
9	Palakkad	7172	6.13	8.22
10	Malappuram	12678	10.84	11.40
11	Kozhikode	9035	7.73	9.04
12	Wayanad	2547	2.18	2.47
13	Kannur	8799	7.52	7.58
14	Kasargod	5457	4.67	3.78
	State	**116953**	**100.00**	**100.0**

District-wise details of the number of farmers enrolled and the number of farmers who received indemnity in the scheme since February 2000 in each district are given in Table 5.2.

It is noted that the proportion of the farmers indemnified to total farmers enrolled has been the highest in Wayanad, 77.6 percent as against the average (40.67 percent) for the state as a whole. While the number enrolled in Wayanad formed only 2.18 percent, the proportion indemnified came to 4.16 percent, of the State total.

In Kottayam, Idukki, Kasargod, and Pathanamthitta more than one half of the enrolled farmers received indemnity. Palakkad district had the lowest proportion, only 16.29 percent.

Table 5.2 District-wise distribution of farmers enrolled and indemnified (till February 2000)

Sl. No.	District	No. of Farmers enrolled	No. of Farmers indemnified	Proportion of farmers indemnified to farmers enrolled (percent)
1	Thiruvananthapuram	9274	2870	30.95
2	Kollam	8435	3381	40.08
3	Pathanamthitta	8415	4284	50.91
4	Alappuzha	10636	3671	34.51
5	Kottayam	7076	4278	60.46
6	Idukki	5029	2964	58.94
7	Ernakulam	9998	4585	45.86
8	Thrissur	12402	4019	32.41
9	Palakkad	7172	1168	16.29
10	Malappuram	12678	4032	31.80
11	Kozhikode	9035	3555	39.35
12	Wayanad	2547	1978	77.66
13	Kannur	8799	3474	39.48
14	Kasargod	5457	3308	60.62
	State	**116953**	**47567**	**40.67**

Banana farmers are seen to have received nearly 48 percent of the total indemnity paid to insured farmers in the state. This is equal to the indemnity received by rubber, coconut, and arecanut farmers put together.

All the other crops had only very low shares of less than one percent each. Together they accounted for less than seven percent of the total indemnity disbursed.

Table 5.3 Amount of indemnity sanctioned for different crops in Kerala (up to June 1999)

Crop	Amount of Indemnity sanctioned (Rs. in lakhs)	Percentage
Banana	399.09	47.79
Rubber	274.49	32.87
Coconut	105.56	12.64
Arecanut	21.96	2.63
Betelvine	8.27	0.99
Pepper	6.85	0.82
Paddy	5.51	0.66
Vegetables	3.51	0.42
Cashew	3.17	0.38
Nutmeg	1.92	0.23
Tapioca	1.34	0.16
Sesame	0.84	0.10
Ginger	0.75	0.09
Cocoa	0.5	0.06
Yam	0.25	0.03
Pulses	0.75	0.09
Coffee	0.17	0.02
Clove	0.08	0.01
Sweet potato	0.08	0.01
Total	**835.09**	**100.00**

The total amount of indemnity paid till June 1999 came to Rs 835.09 lakh (Table 5.3). The pattern of distribution of compensation to different crops reflects the irrational way the programme has been functioning. All annual crops other than banana, together received only less than four percent of the total indemnity; all perennial crops together received about 48 percent. It is obvious that annual crops are more prone to damages and losses due to natural calamities as well as pest and diseases. So an insurance scheme that addresses the needs of farmers should incorporate in it damages and losses due to pests and diseases, especially with special packages for annual crops. Insurance schemes for perennial crops and annual crops should be designed separately. The yield and price of perennial crops should be considered for determining their indemnity, while in the case of annual crops, it should be the cost of cultivation that should be emphasised for the purpose.

Figure 5.1 Percentage of indemnity sanctuioned for different crops

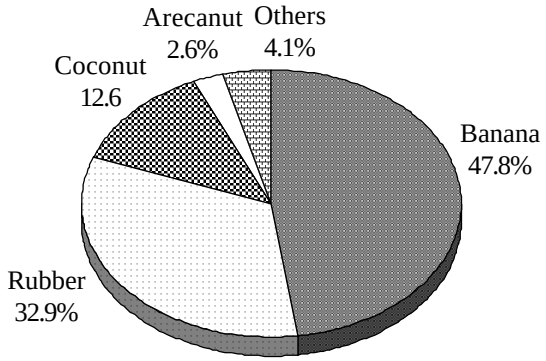


Table 5.4 Percentage share of premium and indemnity through districts in the State Crop Insurance Scheme

Sl. No.	District	Premium (% to state total)	Indemnity (% to state total)	No. of farmers indemnified(%)
1	Thiruvananthapuram	4.87	4.32	6.03
2	Kollam	4.66	4.51	7.11
3	Pathanamthitta	8.60	8.22	9.01
4	Alappuzha	4.85	4.23	7.72
5	Kottayam	9.57	10.94	8.99
6	Idukki	5.44	6.30	6.23
7	Ernakulam	9.15	9.41	9.64
8	Thrissur	6.91	6.55	8.45
9	Palakkad	6.14	3.23	2.46
10	Malappuram	10.80	9.65	8.48
11	Kozhikode	7.69	6.72	7.47
12	Wayanad	6.98	14.33	4.16
13	Kannur	9.41	6.08	7.30
14	Kasargod	4.93	5.50	6.95
	Total	100.00	100.00	100.00

As is evident from Table 5.4, the highest amount collected as premium was from the district of Malappuram (10.80 percent); however, the highest amount disbursed as indemnity was to Wayanad (14.33 percent). The contribution of Wayanad to premium was as low as 4.16 percent. Interestingly, the lowest amounts collected by way of premium were from Thiruvananthapuram and Kollam districts.

The ratio of indemnity to total premium collected in the State is 3.3 (Table 5.5). The ratio

was the lowest in Palakkad district (1.7) where Rs 16.74 lakh of premium was collected and Rs 28.80 lakh disbursed as indemnity. Among the districts, Wayanad had the maximum claim ratio, 6.7. Wayanad district collected an amount of Rs 19.03 lakh as premium and distributed an amount of Rs 127.56 lakh as indemnity. The data indicate that the scheme was an unduly heavy financial burden for the government and highly uneconomic. The principle of insurance – no profit no loss – could not be satisfied. This may have been the reason for the failure of the scheme.

Table 5.5 Ratio of indemnity to premium collected from districts

Sl. No.	District	Premium collected	Indemnity given	Ratio of Indemnity to Premium
1	Thiruvananthapuram	13.29	38.49	2.9
2	Kollam	12.71	40.20	3.2
3	Pathanamthitta	23.47	73.17	3.1
4	Alappuzha	13.22	37.65	2.8
5	Kottayam	26.1	97.37	3.7
6	Idukki	14.84	56.09	3.8
7	Ernakulam	24.97	83.83	3.4
8	Thrissur	18.86	58.35	3.1
9	Palakkad	16.74	28.80	1.7
10	Malappuram	29.47	85.96	2.9
11	Kozhikode	20.97	59.84	2.9
12	Wayanad	19.03	127.56	6.7
13	Kannur	25.66	54.12	2.1
14	Kasargod	13.45	48.99	3.6
	State	272.78	890.42	3.3

The financial experience of the government with the crop insurance scheme has been disastrous. In all the cases, the programmes were heavily subsidised and the government paid not only part of the premium, but met most of the delivery and service costs as well. The government had to shoulder the losses even when the losses exceeded the targeted levels. In order to be profitable, a private insurer would devise the scheme in such a way that the amount collected by way of premium exceeds or at least does not fall lower than, the amount paid by way of indemnity. Again, there remain administrative costs. A comparative study conducted by Jerry Skees *et al*, 1999 stated that India has the maximum ratio of indemnity to premium among the seven countries studied.

Without understanding the magnitude of administrative costs, it is not possible to calculate the financial burden to be borne by the government. The high indemnity-premium ratio clearly shows that the crop insurance programme implemented by the Kerala Government was not actuarially sound.

Crop insurance scheme in Wayanad district

Out of the 2547 farmers enrolled in the Wayanad district, 1980 applied for, and all of them were granted indemnity. The inference is clear. Most of the farmers in Wayanad district who insured did so far claiming indemnity. In fact, the majority of them insured after the crop failure and they applied for indemnity immediately after the minimum prescribed period of seven days. This they did in connivance with the officials of the insurance scheme and was contradictory to all norms. An insurance scheme should be one which spreads risk horizontally among all farmers of a locality and spread through a period of several years.

Table 5.6 Details of crop insurance scheme in Wayanad district

Particulars	Unit	Kerala	Wayanad	% to state
Farmers enrolled	Nos.	116953	2547	2.18
Premium collected	Rs. in Lakhs	272.78	19.03	6.98
Application received for compensation	Nos.	50264	1980	3.94
Application received for compensation	Amount (Rs. in lakhs)	925.06	127.83	13.82
Application sanctioned	Nos.	47567	1980	4.16
Application sanctioned	Amount (Rs. In lakhs)	890.42	127.83	14.36
No. of agents	Nos.	4629	227	4.90
Commission paid to agents	Amount (Rs. in lakhs)	14.16	1.4	9.89
Amount of compensation sanctioned for Banana	Rs. in lakhs	399.09	125.03	31.33

Out of Rs 272.78 lakh collected as premium in the State, Wayanad district contributed only 6.98 percent (Rs 19.03 lakh).

In Wayanad district, 227 agents (4.90 percent of the total number of agents for the state as a whole) worked for collecting the premium. The enrolment of farmers in the district came to 2.16 percent of the State total. Banana was the major crop, which received indemnity in the State accounting for nearly 48 percent of the total amount sanctioned. Wayanad district received more than 31 percent of the amount sanctioned for the banana crop.

The performance of the crop insurance scheme in Wayanad district for the different crops is depicted in Table 5.7. About 88 percent of the premium collected and 98 percent of the indemnity distributed were for banana. The scheme as a whole may be called a banana scheme, the other crops having played only an infinitesimally small role.

Thirteen crops were covered in the scheme in Wayanad district. Next to banana, the highest

premium collected was for rubber (nine percent). But the indemnity given for rubber was merely about one percent. The crop insurance scheme for perennial crops needs to be designed separately and the coverage level and annual premium determined scientifically. In the present scheme, for rubber, the premium was Rs 2 /year /tree, compounded to Rs 5 /tree for three years. The freezing of the scheme in the second year before the lapse of the coverage period of the crop, has made an adverse impact on farmers and shaken their confidence in crop insurance schemes of the State.

Table 5.7 Details of the crop insurance scheme in Wayanad (1995-2000)

Crops	Premium			Indemnity		
	Nos./ extent	Amount (Rs.)	% to total	Nos./ extent	Amount (Rs.)	% to total
Cocoa	28	28.00	Neg.			
Oil seeds	0.2 ha	50.00	Neg.			
Cashew	115	230.00	0.01			
Tea	0.4 ha	400.00	0.02			
Coffee	816	1,442.00	0.08	11	825.00	0.01
Paddy	11.56 ha	2,890.00	0.15	0.2ha	1,000.00	0.01
Ginger	18.91ha	4,729.00	0.25	0.38 ha	13,600.00	0.11
Vegetable	19	4,762.00	0.25	1.84ha	31,250.00	0.24
Pepper	9557	10,675.00	0.56	84	2,840.00	0.02
Arecanut	11349	15,209.00	0.80	287	27,410.00	0.21
Coconut	6766	12,199.00	0.64	170	53,000.00	0.41
Rubber	26051	173,092.00	9.09	207	150,300.00	1.18
Banana	838846	1677,692.00	88.14	619058	12502,748.00	97.81
Total		**1903398.00**	100.00		**12782,973.00**	100.00

The rest of the crops constituted less than three percent of the premium collected and about one percent of the indemnity given. The extensive coverage given to a single crop, banana, though rubber and coconut together constitute a large share in the cropping pattern, has precipitated the failure of the programe. Crops like ginger, turmeric, and cardamom that are highly risky had only scant coverage in the crop insurance scheme. Table 5.7 shows that out of the18.91 ha of ginger crop covered under the scheme, only an area of 0.38 ha was indemnified. The low claim of indemnity could have been due to the untimely freezing of the programme. The biased performance of the scheme might have denied genuine compensation for many farmers who had insured their crop under the scheme.

6. Estimation of Realistic Premium

Characteristics of the sample

Nearly two-fifths of the sample had smallholdings of 1-2 hectares. About 35 percent were marginal farmers having an area of less than one hectare. About one-fourth had farms of more than two hectares (Table 6.1).

Table 6.1 Classification of farmers based on total holding size

Area of Landholding	Percent
Less than1 ha	35
1-2 ha	39
Above 5 acre	26

Forty-seven percent of the farmers had banana cultivation in less than one-fourth of their area and about one-fourth of them cultivated banana in less than half the area of their holdings. Seventeen percent cultivated banana in more than one-half to about three-fourths the area of their holdings. Only 10 percent cultivated banana in more than 75 percent of the area (Table 6.2).

Table 6.2 Distribution of farmers according to size of cultivation & proportion of area under banana

Area under banana (percent of total holding area)	Percentage of Cultivators
Below 25	47
25 - 50	26
50 - 75	17
Above 75	10

Only 32 percent of the sample banana cultivators had enrolled under the crop insurance scheme. More than two-thirds kept out. Thus we find that risks were not spread extensively and the coverage of the farmers in the insurance scheme was small.

The proportion of banana cultivators who were insured according to the area of banana cultivation is shown in Table 6.3. Nearly one-third of the farmers who had banana cultivated in less than one-fourth of the area of their holdings had insurance cover. Forty-six percent of the insured farmers had banana cultivation in the range of 25 percent and 50 percent of their holding area.

Though banana is a risky venture, the majority of farmers who cultivated it as their main

crop kept out of the insurance scheme. Most of them were small or marginal farmers not capable of paying the premium in lump sum, particularly in the absence of any credit facility.

In the case of farmers who had diversified their crops, insurance did not provide risk coverage; they viewed it merely as an additional security measure against crop loss.

Risk aversion

Risk was found to be a strong characteristic aversion of the respondents.

Table 6.3 Proportion of Insured banana farmers according to holding size

Proportion of area under banana (%)	Not insured (%)	Insured (%)
Below 25 %	66	34
25-25	54	46
50-75	88	12
Above 75	80	20

According to three-fifths of the banana farmers, banana cultivation was a risky venture and the returns from it quite unpredictable. Despite the high degree of risk, banana cultivation was reportedly profitable. The vast majority of the farmers were neither willing to reduce the area of banana cultivation (88 percent) nor willing to abandon banana cultivation altogether (94 percent) [Table 6.4]. It was found that nearly four in every five farmers were aware of the State crop insurance scheme.

Table 6.4 Opinions of respondents about crop insurance of banana

Opinion	Yes (%)	No (%)
Banana cultivation is a risky venture	60	40
Is willing to reduce area	12	88
Is willing to abandon banana cultivation	6	94
Is aware of the insurance scheme	78	22
Is willing to insure the crop	51	49
Insurance should be compulsory	75	25
Insurance should be linked with credit	74	26

The majority of the farmers are found to be of the view that crop insurance should be made compulsory and that credit facilities should be made available along with the crop insurance scheme.

The State crop insurance scheme has a very low coverage among the farmers. More than one-half the respondents stated that they are willing to insure their crops. The reasons for unwillingness were lack of confidence in the scheme and high premium rates. But the majority (more than three-fifths) mentioned other reasons, the most important among them being financial. They found it difficult to remit premium amounts during the gestation period of the crop. Cumbersome administrative procedures was another reason. Lack of awareness of the scheme was mentioned only by a few.

Area, production and productivity of banana in Wayanad

Wayanad is a traditional banana cultivating district which produced in 1999-2000, 65.7 thousand tonnes. Thus, one-sixth of the banana production came in this year from Wayanad. Details of area and production of banana (*nendran*) in Wayanad and for the state as a whole since 1992-93 are given in Table 6.5.

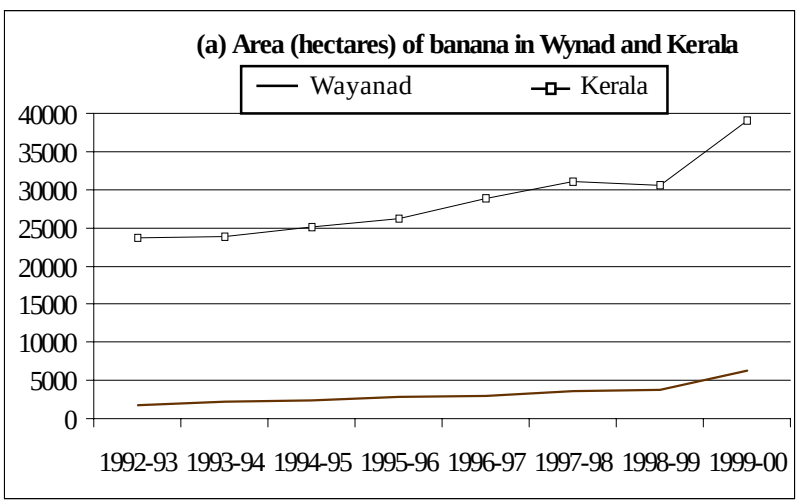
Table 6.5 Area, production and yield of banana since 1992-'93

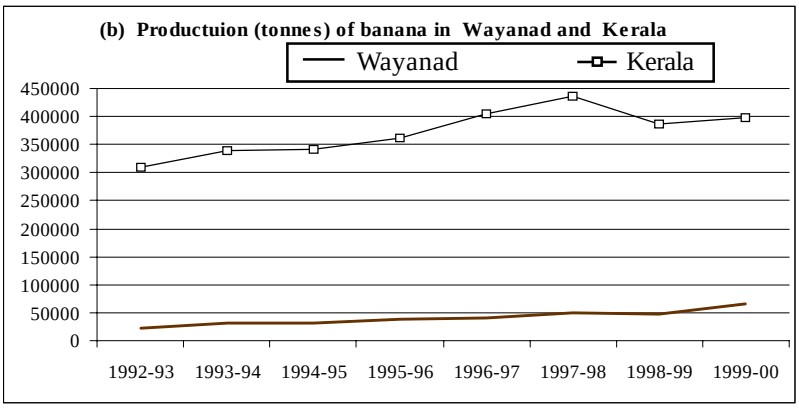
Year	Wayanad			Kerala		
	Area (ha)	Production (tonnes)	Yield (kg/ha)	Area (ha)	Production (tonnes)	Yield (kg/ha)
1999-2000	6342	65753	10368	39046	398145	10197
1998-99	3726	47663	12792	30521	386588	12666
1997-98	3618	50737	14023	31001	436717	14087
1996-97	2965	41679	14057	28855	403673	13990
1995-96	2790	39522	14166	26267	362919	13817
1994-95	2353	32615	13861	25151	342006	13598
1993-94	2154	32124	14914	23850	339994	14256
1992-93	1694	23434	13834	23667	308871	13051

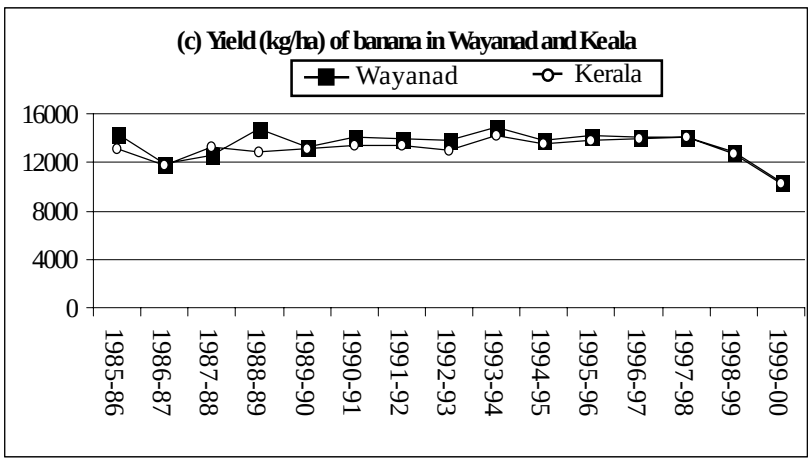
Source: Directorate of Economics and Statistics, Kerala

Area and production of banana in Wayanad has substantially increased during the 1990s, but productivity marginally declined from nearly 13.8 thousand kilogrammes per hectare in 1992-1993 to 10.4 thousand in 1999-2000. Banana cultivation in Wynad does not seem to have been a risky venture at all. The trends of area production and productivity of banana cultivation in Wynad and Kerala are shown in Figure 6.1.

Fig. 6.1 Area, production and productivity of banana







The available data do not show that banana cultivation had undergone any serious crop damage or loss during the 1990s either at the district level or in the state as a whole. The reasons for the heavy compensation paid to the farmers who had insured the banana crops in Wayanad district during the years of inception of the scheme cannot therefore be justified. In fact, yield and production of banana during the years for which heavy compensation was given, were even higher than those of the later years.

Estimation of realistic premium

Premium rate is the amount payable in pre-determined instalments to the insurer by the insured for the insurance protection offered to him. It is calculated, in principle, on the average of the indemnities paid to farmers over years and over areas, for a unit of cropped area.

Cost of cultivation

For estimating the realistic premium rate, data of cost of cultivation are required. In order to calculate the cost of production, we collected the details of expenditure incurred by the respondents for all the operations involved and the costs of inputs.

The cost of cultivation of Banana (*Nendran*) in Padinharethara *panchayat* (Rs.71.38 per plant) was higher than in Ambalavayal (Rs.57.96) and Panamaram (Rs. 52.62) *panchayats*. This was mainly on account of the comparatively higher cost incurred for hired labour, which was the resultant of the lack of labour in Padinharethara caused by shortage of labout supply and high labour demand for weeding and land preparation activities. On an average the total cost (Cost A_1) incurred for the *Nendran* cultivation in Wayanad District was Rs.36.56 per plant. But if we consider all the imputed costs (Cost C_2), it came to Rs.60.65. Hired labour, Propping charges and Manures and Fertilizers together accounted for more than 70 per cent of the cost incurred (Figure 6.2).

Table 6.6 Cost of cultivation of Banana *Nendran* in Wayanad

(Rs/plant)

Particulars	**Padinharethara**	**Ambalavayal**	**Panamaram**	**Wayanad**
Planting material	1.94	2.17	2.07	2.06
Manure	4.06	2.80	2.80	3.22
Fertilizers	5.84	7.69	6.63	6.72
PP chemicals	0.70	2.13	0.99	1.27
Propping	9.74	8.46	5.49	7.89
Irrigation charges	2.70	2.70	2.70	2.70
Hired labour	14.97	2.17	6.71	7.95
Interest on working capital	4.49	2.13	3.08	3.23
Land revenue	0.02	2.70	0.02	0.91
Depreciation	0.60	0.60	0.60	0.60
Total Direct Costs (Cost A1)	45.06	33.55	31.09	36.56
Cost A2	51.96	40.70	38.24	43.63
Cost B1	60.79	47.61	44.74	51.05
Cost B2	63.89	50.46	47.59	53.98
Cost C1	71.38	57.96	52.62	60.65
Cost C2	71.38	57.96	52.62	60.65

The direct costs (cost A1) incurred per plant was Rs 36.56 and the returns realised was Rs 86.32 per plant resulting in a net return of Rs 49.76 per plant and a benefit cost ratio of 2.36. The total cost incurred per plant increased to Rs 60.65 when are all imputed costs were also included (cost C2) and net returns declined to Rs 25.67. On the basis of Cost C2, the benefit – cost ratio worked out to 1:42 (Table 6.7). All the cost calculations show that banana cultivations show that banana cultivation in Wayanad is a highly profitable proposition.

Figure 6.2 input use patten of Banana farming in Wayanad District

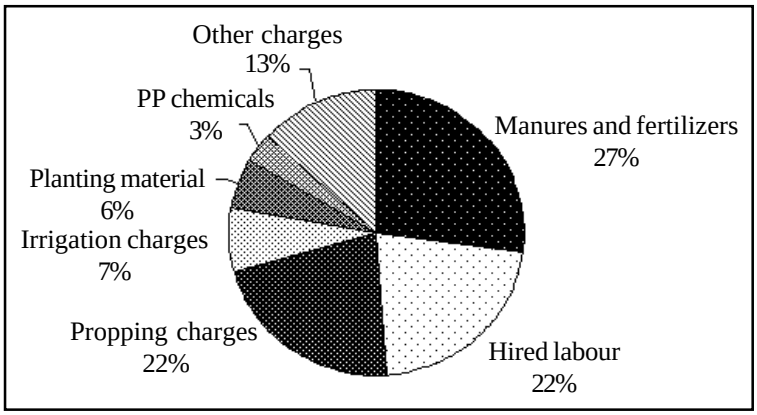


Table 6.7 (i) Economics of Banana farming in Wayanad

Cost Concept	Cost (Rs per plant)	Returns (Rs/plant)	Net Return (Rs/ plant)	B-C ratio
Cost A1	36.56	86.32	49.76	2.36
Cost A2	43.63	86.32	42.69	1.98
Cost B1	51.05	86.32	35.27	1.69
Cost B2	53.98	86.32	32.34	1.60
Cost C1	60.65	86.32	25.67	1.42
Cost C2	60.65	86.32	25.67	1.42

Table 6.7 (ii) Economics of Banana farming in Ambalavayal *Panchayat*

Cost Concept	Cost (Rs. per plant)	Returns (Rs./plant)	Net Return (Rs./ plant)	B-C ratio
Cost A1	33.55	93.64	60.10	2.79
Cost A2	40.70	93.64	52.95	2.30
Cost B1	47.61	93.64	46.03	1.97
Cost B2	50.46	93.64	43.18	1.86
Cost C1	57.96	93.64	35.68	1.62
Cost C2	57.96	93.64	35.68	1.62

Table 6.7 (iii) Economics of Banana farming in Padinharethara *Panchayat*

Cost Concept	Cost (Rs. per plant)	Returns (Rs./plant)	Net Return (Rs./ plant)	B-C ratio
Cost A1	45.06	81.91	36.85	1.82
Cost A2	51.96	81.91	29.95	1.58
Cost B1	60.79	81.91	21.12	1.35
Cost B2	63.89	81.91	18.02	1.28
Cost C1	71.38	81.91	10.53	1.15
Cost C2	71.38	81.91	10.53	1.15

Table 6.7 (iv) Economics of Banana farming in Panamaram *Panchayat*

Cost Concept	Cost (Rs. per plant)	Returns (Rs./plant)	Net Return (Rs./ plant)	B-C ratio
Cost A1	31.09	83.50	52.41	2.69
Cost A2	38.24	83.50	45.26	2.18
Cost B1	44.74	83.50	38.76	1.87
Cost B2	47.59	83.50	35.91	1.75
Cost C1	52.62	83.50	30.88	1.59
Cost C2	52.62	83.50	30.88	1.59

The realistic premium rates worked out for the three panchayats separately and for the Wayanad district as a whole are presented in Table 6.8. For the Wayanad district as a whole the average premium estimated per plant came to Rs.3.00 at cost A_1 and to Rs 4.98 on the basis of Cost C2.

Table 6.8 Premium rates estimated at various coverage levels

Cost Concept	Premium anount (Rs.per plant)			
	Padinharethara	Ambalavayal	Panamaram	Wayanad
Cost A1	3.70	2.75	3.00	2.55
Cost A2	4.27	3.34	3.58	3.14
Cost B1	4.99	3.91	4.19	3.67
Cost B2	5.25	4.14	4.43	3.91
Cost C1	5.86	4.76	4.98	4.32
Cost C2	5.86	4.76	4.98	4.32

The economics of banana farming after including the premium rates are presented in Table 6.9 (i-iv). The benefit cost ratio in all the three panchayats taken together declined in consequence. On including the premium rate, the benefit-cost ratio in the case of Padinharethara came down to 1.06 – almost a no loss-no profit situation (cost inclusive of all the nominal and imputed items). The overall situation in Wayanad district offers however presents a picture favourable for the introduction of crop insurance scheme, the B-C ratio being not less than 1.32 even after including expenditure and the premium rates for insurance.

Table 6.9 (i) Economics of Banana farming after including premium rates: Wayanad (Rs/ plant)

Cost Concept	Cost (Rs.)	Premium Rate (Rs.)	Total Cost (Rs.)	Total Return (Rs.)	Net Return (Rs.)	B-C ratio
Cost A1	36.56	3.00	39.56	86.32	46.76	2.18
Cost A2	43.63	3.58	47.21	86.32	39.11	1.83
Cost B1	51.05	4.19	55.24	86.32	31.08	1.56
Cost B2	53.98	4.43	58.41	86.32	27.91	1.48
Cost C1	60.65	4.98	65.63	86.32	20.69	1.32
Cost C2	60.65	4.98	65.63	86.32	20.69	1.32

Table 6.9 (ii) Economics of Banana farming after including premium rates: Ambalavayal Panchayat (Rs./ plant)

Cost Concept	Cost (Rs.)	Premium Rate (Rs.)	Total Cost (Rs.)	Total Return (Rs.)	Net Return (Rs.)	B-C ratio
Cost A1	33.55	2.75	36.3	93.64	57.34	2.58
Cost A2	40.70	3.34	44.04	93.64	49.6	2.13
Cost B1	47.61	3.91	51.52	93.64	42.12	1.82
Cost B2	50.46	4.14	54.6	93.64	39.04	1.72
Cost C1	57.96	4.76	62.72	93.64	30.92	1.49
Cost C2	57.96	4.76	62.72	93.64	30.92	1.49

Table 6.9 (iii) Economics of Banana farming after including premium rates: Padinharethara Panchayat (Rs./ plant)

Cost Concept	Cost (Rs.)	Premium Rate (Rs.)	Total Cost (Rs.)	Total Return (Rs.)	Net Return (Rs.)	B-C ratio
Cost A1	45.06	3.70	48.76	81.91	33.15	1.68
Cost A2	51.96	4.27	56.23	81.91	25.68	1.46
Cost B1	60.79	4.99	65.78	81.91	16.13	1.25
Cost B2	63.89	5.25	69.14	81.91	12.77	1.18
Cost C1	71.38	5.86	77.24	81.91	4.67	1.06
Cost C2	71.38	5.86	77.24	81.91	4.67	1.06

Table 6.9 (iv) Economics of Banana farming after including premium rates: Panamaram Panchayat (Rs./ plant)

Cost Concept	Cost (Rs.)	Premium Rate (Rs.)	Total Cost (Rs.)	Total Return (Rs.)	Net Return (Rs.)	B-C ratio
Cost A1	31.09	2.55	33.64	83.50	49.86	2.48
Cost A2	38.24	3.14	41.38	83.50	42.12	2.02
Cost B1	44.74	3.67	48.41	83.50	35.09	1.72
Cost B2	47.59	3.91	51.50	83.50	32.00	1.62
Cost C1	52.62	4.32	56.94	83.50	26.56	1.47
Cost C2	52.62	4.32	56.94	83.50	26.56	1.47

To make an assessment of the impact of external shocks and stresses in banana cultivation in Wayanad, the risk-bearing ability of the farmer has been done using the sensitivity analysis taking into consideration only direct costs. The results of the analysis are presented in table 6.10. For this purpose, the cost was increased by 5 percent and 10 per cent keeping the

returns constant and then the returns were decreased by 5 percent and 10 percent keeping the cost constant and the B-C ratio and Net Returns worked out. It was found that the net returns were positive and the B-C ratio remained well above unity for all the cases. Reduction in returns was found to affect the economic feasibility more than increase in cost.

Relevancy rating was employed to estimate the relative importance of each of the major constraints faced in the implementation of the crop insurance scheme in Kerala and to rank them in the order of their importance (Table 6.11). The relevancy coefficients were found to vary from 0 to unity. The schemes covered only a limited number of crops and farmers. Non-inclusion of the pests and diseases under the purview of the crop insurance scheme, and the lack of financial feasibility of the schemes as a whole, came next in the order. The other constraints such as lack of awareness among the farmers, high premium rates and absence of linkages between agricultural credit and crop insurance were found to be less important as constraints.

Table 6.10 Sensitivity analysis in Banana cultivation of Wayanad

	Panamaram		Ambalavayal		Padinharethara		Waynad	
	B-C ratio	Net Returns	B-C ratio	Net Returns	B-C ratio	Net Returns	B-C ratio	Net Returns
5 per cent increase in cost; returns being the same	2.08	43.35	1.95	40.77	1.53	28.94	1.88	40.51
10 per cent increase in cost; returns being the same	1.99	41.44	1.87	38.74	1.46	26.34	1.80	38.33
5 per cent decrease in return; the costs being the same	2.07	41.09	2.33	50.72	2.03	39.57	1.88	38.37
10 per cent decrease in return; the costs being the same	1.97	36.91	2.20	46.04	1.93	35.48	1.78	34.06

Table 6.11 Constraints of implementation of Crop Insurance Scheme in Kerala

Rank	Constraint	Relevancy Coefficient
1	Crop Insurance scheme covers only limited number of crops and farmer population	0.9014
2	The crop damages in the purview of crop insurance scheme do not include pest and disease attack	0.8829
3	Financial viability of the scheme as a whole is lacking	0.8725
4	Lack of Proper awareness among farmers about the programme	0.5489
5	High premium rates for the farmers to afford	0.5103
6	Absence of linkages between agriculture credit and crop insurance	0.4986

7. Suggestions and policy implications

This study on the performance of the State crop insurance scheme was designed to conduct an enquiry into the implementation of the scheme in the Wayanad district. The scheme was, however, abruptly withdrawn after its second year and operations indefinitely withheld. This study had therefore to be done based on an evaluation of performance.

The scheme as such is seen to have been a failure considering the normal objectives of a crop insurance scheme. The ratio of the number of farmers enrolled to the number indemnified was very narrow. The ratio of indemnity sanctioned to premium collected was extra-ordinarily high, of an order of 1:3:3. This shows that the scheme was not financially viable and that it caused a heavy burden to the government, the implementing agency. The normal concept of a crop insurance scheme is that risks are spread horizontally to all the farmers of the area and vertically over a period of years.

The official version of the experience was that farmers enrolled themselves in the scheme only when they actually faced a threat of damage. Insurance premium was remitted at the time of the damage and the claim was submitted within a week of enrolment. This problem of bogus enrolment can be tackled to some extent if the minimum period for claiming the indemnity were raised from 7 days to 15 days.

The majority of the farmers cultivating banana had agriculture as their main source of income. The reason stated for non-enrolment in insurance was not lack of awareness or high premium rate but cumbersome administrative procedures and financial difficulty to pay premium at the pre-gestation stages of cultivation. Even the farmers who had adequate financial resources were reluctant to pay premium in bulk, out of their own sources. Linking of a credit facility with crop insurance programme is found to be an inevitable condition for its success.

The crop insurance scheme shall be made viable by spreading the risk horizontally by enrolling all the farmers in a locality in the scheme. The scheme should be attractive, credit-linked, and should have support facilities like a reinsurance package.

The majority of farmers are not willing to leave banana cultivation in future even if it involves high risk. So a package that covers a longer period (for example a three-year package) with a premium that considers the cost of cultivation for the period as a whole, has to be thought of. This will help bring down premium rates, by saving on cost of land preparation, especially in reclaimed lands.

Damages and losses due to pests and diseases are an important problem in farming, especially in annual crops. The farmers who are destined to struggle with these hazards demand incorporation of the losses caused by these hazards, in the crop insurance scheme. Diseases such as *Kokkan*, and bunchy top, have to be included in the list of hazards and the loss for indemnity. The amount of indemnity should be assessed considering the dispersion of actual yield from the threshold yield. This is being successfully practised in KHDP insurance programme.

A reassurance programme should be an integrated part of any insurance programme in which credit facilities are linked with the scheme. If the crop fails in a season covered in an insurance scheme, the insured farmers should be supported with credit facilities for going to the next crop season.

Development personnel and policy makers have unanimously approved the crop insurance programme as inevitable for a sound agricultural production system. Though decentralisation of planning and development has been the active subject of thought and action in the State, policy matters regarding support mechanisms such as credit, insurance and financial and marketing services have not received adequate attention; nor have they acquired adequate momentum. The primary co-operative credit societies (PACS) have been actively involved in rural financing system for a long time. Credit facilities given by these financial institutions and crop insurance programmes could be effectively linked to the benefit of both and of the needy farmers. The mechanism could be installed by the state with a corpus fund incorporating the activities of insurance companies, PACS, and rural banks, in its scope. Such a decentralised mechanism that involves the local rural credit agency in the crop insurance scheme will make more funds available for agricultural operations.

Linking the crop insurance scheme with credit facilities will streamline administrative procedure for enrolling farmers in crop insurance scheme. Loss assessment and collection of premium may be vested with the PACS with support from the Agricultural Department. Linking of credit with insurance would extend horizontal spreading of risk.

Premium rates and coverage level should be fixed scientifically for at least the district level considering variations in cost of cultivation and yield across areas even within the same district. Commission charges, which used to be given, may be diverted to other services such as awareness creation and service charges to PACS.

Option for non-credit-linked insurance should be given to farmers who do not need credit facilities for farming operations.

Insurance coverage for short-duration crops / annual crops is currently from the seventh day of remittance of premium, to the date of harvest. If the minimum duration to claim indemnity is extended at least to 15 or 20 days, the tendency to stake false claims could be curbed to a large extent. Group insurance through group farming *samitis* or farmers' groups may be promoted and the indemnity claims submitted with due recommendation of the *samitis.*

ANNEXURE – 1 State Crop Insurance Scheme

S. No.	Crop	Minimum area/no. for coverage under the scheme.	Age of crop covered under the scheme	Premium rate	Indemnity (Rs.)
1.	Coconut	10 nos.	Tree with minimum production of 30 nuts/year	Rs. 2/ year/ palm (Rs. 5 compounded for three years)	Rs. 1000/ palm
2.	Arecanut	10 nos.	Productive palm	Rs. 1/ year/ palm (Rs. 2 compounded for three years)	Rs. 100/palm
3.	Rubber	25 nos.	Tapping trees	Rs. 2/ year/ tree (Rs. 5 compounded for three years)	Rs. 500/palm
4.	Cashew	5 nos.	Productive	Rs. 2/ year/ tree (Rs. 5 compounded for three years)	Rs.200/palm
5.	Banana (Nendran, Kappa, palayamkodan, Robusta)	10 nos.	1 to 5 months after planting.	Rs. 2/ plant	Rs. 20/plant for non bunched. Rs. 50/plant for bunched plant.
6.	Tapioca	0.02 ha (5 cent)	1-5 months after planting.	Rs. 2/ 0.02 ha	Rs. 100/0.02 ha
7.	Pineapple	0.02 ha (5 cents)	1 to 6 months after planting.	Rs. 25/ 0.02 ha	Rs. 500/ 0.02 ha
8.	Pepper	15 nos. on standards	Productive	Rs. 1/plant on standard / year (Rs. 2 compounded for 3 years)	Rs. 40/ year / plant
9.	Cardamom	1 ha	Productive	Rs. 1000/ha/year (Rs. 2500 compounded for three years)	Rs. 30000/ha
10.	Ginger	0.02 ha (5 cents)	1 to 5 months after planting	Rs.10 / 0.02 ha	Rs. 800/ 0.02 ha (Rs. 40000/ha)
11.	Turmeric	0.02 ha (5 cents)	1 to 3 months after planting	Rs. 10 /0.02 ha	Rs. 800/ 0.02 ha (Rs. 40000 /ha)

12.	Coffee	10 trees	Productive	Rs. 1/ plant / year (Rs. 2 compounded for three years)	Rs. 75 / plant
13.	Tea	1 ha	Plucking plants	Rs. 1000/ha /year (Rs. 2500 compounded for three years)	Rs. 60000/ha (Limited to 10% of the crop or 2 ha whichever is less)
14.	Cocoa	5 nos.	Productive	Rs. 1/ plant / year (Rs. 2 compounded for 3 years)	Rs. 35/ plant
15.	Ground nut	0.1 ha (25 cents)	1 to 2 months after planting.	Rs. 25 / 0.1 ha	Rs. 800 /0.1 ha
16.	Sesame	0.1 ha	1 week to 1 month after sowing	Rs.25/0.1 ha	Rs. 500/0.1 ha (Rs. 5000/ha)
17.	Vegetables	0.04 ha (10 cents)	1 week to 1 month after planting	Rs. 10 / 10 cents	Rs. 600 / 10 cent for non trailed. Rs. 1000/10 cents for trailed on pandals.
18.	Nutmeg	5 nos.	Productive	Rs. 2/ plant / year (Rs. 5 compounded for three years)	Rs. 200/ tree
19.	Clove	5 nos.	Productive	Rs.2/ plant / year (Rs. 5 compounded for 3 years)	Rs. 150/ tree
20.	Betelvine	1 cent	Harvesting	Rs. 5/cent /year	Rs. 250/cent
21.	Pulses	0.1 ha (25 cent)	2 weeks to 6 weeks after planting	Rs. 12.5 / 0.1 ha	Rs. 250 /0.1 ha
22.	Tuber crops	0.02 ha	1 to 3 months after planting	Rs. 5/0.02 ha for Amorphophallus Rs. 3 / 0.02 ha for sweet potato.	Rs. 500/ 0.02 ha for amorphophallus and Rs. 200/ 0.02 ha for sweet potato
23.	Sugarcane	0.1 ha	1 to 3 months after planting.	Rs. 60/0.1 ha	Rs. 3000 /0.1 ha
24.	Tobacco	0.02 ha	2 weeks to 2 months after planting.	Rs. 2/ 0.02 ha	Rs. 400/0.02 ha
25.	Paddy	0.1 ha	15 to 60 days after transplanting/ sowing.	Rs. 25/0.1 ha	Rs. 300 /0.1 ha for crops before 45 days Rs. 500 /0.1 ha for crops after 45 days.

ANNEXURE – II Crop insurance scheme for perennial crops at pre-bearing period.

Sl. No.	Crop	Minimum area/no. for coverage under the scheme.	Age of crop covered under the scheme	Premium rate	Indemnity (Rs.)
1.	Coconut	10 nos.	One month to 7 years after planting.	Rs. 1/ year/ palm (Rs. 2 compounded for three years)	Rs. 100/ palm up to three years. Rs. 200/ palm for 3 - 7 years old.
2.	Arecanut	10 nos.	1 month to 6 years after planting.	Rs. 1/ palm for three years	Rs. 25/palm up to three years. Rs. 40/ palm for 3 - 6 years old.
3.	Rubber	25 nos.	One month to 7 years after planting.	Rs. 1/ tree for three years	Rs. 100/tree up to three years. Rs. 300/ tree for 3 - 7 years old.
4.	Cashew	5 nos.	One month to 3 years after planting.	Rs. 3/ 5 tree for three years	Rs. 50/tree up to three years.
8.	Pepper	15 nos. on standards	One month to 4 years after planting.	Rs. 5/ 15 plant for three years	Rs. 10/ plant up to two years. Rs. 20/ plant for 2 - 4 years old.

ANNEXURE – II Crop insurance scheme for perennial crops at pre-bearing period.

District	No. of Farmers enrolled	Premium collected	Total applications received for compensation		Applications sanctioned		Balance to be sanctioned			
			No.	Amount (Rs. in lakhs)	No.	Amount (Rs. in lakhs)	No.	Amount (Rs. in lakhs)	No of agent	Commission paid
Thiruvananthapuram	9274	13.29	3205	41.9	2870	38.49	335	3.41	546	0.8
Kollam	8435	12.71	3557	42.05	3381	40.2	176	1.85	375	0.2
Pathanamthitta	8415	23.47	4500	73.43	4284	73.17	216	0.26	241	1.2
Alappuzha	10636	13.22	3693	37.93	3671	37.65	22	0.28	195	0.76
Kottayam	7076	26.1	4360	102.05	4278	97.37	82	4.68	141	1.87
Idukki	5029	14.84	3460	57.24	2964	56.09	496	1.15	319	0.37
Ernakulam	9998	24.97	4625	84.63	4585	83.83	40	0.8	280	0.55
Thrissur	12402	18.86	4530	66.09	4019	58.35	511	7.74	888	1.31
Palakkad	7172	16.74	1211	29.65	1168	28.8	43	0.85	546	1.12
Malappuram	12678	29.47	4141	86.6	4032	85.96	109	0.64	247	1.19
Kozhikode	9035	20.97	3558	60.19	3555	59.84	3	0.35	175	1.1
Wynad	2547	19.03	1978	127.56	1978	127.56	0	0	227	1.4
Kannur	8799	25.66	3636	61.08	3474	54.12	162	6.96	283	1.68
Kasargod	5457	13.45	3810	54.66	3308	48.99	262	5.66	166	0.16
TOTAL	116953	272.78	50264	925.06	47567	890.42	2457	34.63	4629	13.71

Terms used in the study

Risk: Risk is defined as a situation where the outcome as well as its probabilities are known, and therefore, the expected result can be obtained.

Uncertainty: A situation where the outcome is not clearly known or its probability is unknown.

Coverage: Coverage is the insurance protection offered by a crop insurance scheme.

Quantum coverage: Coverage of a crop insurance scheme expressed in terms of physical units.

Monetary coverage: Coverage of a crop insurance scheme expressed in monetary terms.

Gross premium / premium / premium rate: This is the final premium charged by the insuring agency for a crop insurance scheme.

Indemnity: It is the compensation payable to the insured farmer for a crop loss arising from the insured cause. It is the quantity by which the yield is less than the coverage.

The Insured: The Insured is the party (farmer) who has to be indemnified by the insuring agency (insurer) when a loss is incurred due to the insured cause.

Pure premium rate: It is the definite amount payable to the insurer by the insured for the insurance protection offered to him. It is equal to the average of the indemnities paid to farmers over years and over areas, for a unit of cropped area.

References

Asian Productivity Organisation. *Crop insurance in Asia,* Seminar papers, Tokyo, 1987

Botts, R.R., J. N. "Boles Use of Normal Curve Theory in Crop Insurance Rate-Making", *J. Farm Econ*. Vol. 40, 1958.

Chandrakanth, M.G., N.S.P. Rebello. "Crop Insurance for Potatoes: A case study", *Financing Agriculture,* Vol. 4, 1980

Dandekar V. M. "Crop Insurance in India", Econ. *Polit. Weekly* Vol. 11, 1976.

———————. "Crop Insurance in India – A review 1976-1985", *Econ. Polit. Weekly* 22 (25 & 26), 1985.

Government of India. *Annual Report*. Department of Agriculture and Co-operation, Ministry of Agriculture, 2000.

Government of Kerala. *Krishi Vikasanam Panchayat Thalathil,* Farm Information Bureau. 1996.

Hemalatha, B. M. *An Economic Analysis of Crop Insurance for Paddy in Bangalore District (rural)*. Unpublished thesis. UAS. Bangalore, 1989.

Hogen, A. J. "The Role of Crop Credit Insurance in the Agricultural Credit System in Developing Economics", Dissertation *Abstracts International,* 13 (8), 1982.

Jorge, C.A. "Assessment of Crop Damage and Actuarial Methods", *Crop Insurance in Asia,* Asian Productivity Organisation, Tokyo, 1987.

Mosely, P., R. K. Murthy. "Can crop insurance work? The case of India" *National Bank News Review* 12 (3), 1996.

Muntaqua, G., K. N. Rao. "Insurance for Horticultural Crops" in Singh H P, et al, (Ed). *Horticulture Development in India,* Coconut Development Board, Kochi.

Pathak, B. S. "Crop Insurance: Retrospects and Prospects", Paper presented at the National Seminar on Crop Insurance through Co-operatives, (Mimeographed), Pune, 24-26 February 1986.

Ratnakumar, J. N. "Comparative Analysis and Evaluation of Crop Insurance Package", *Hortindia* '99, 1999.

Ray, P. K. *Economics of Crop Insurance with Special Reference to the Needs and Situations in Developing Countries,* Kolkata: Central Publishing Concern, 1987.

Rustagi, N. K. *Crop insurance in India: An analysis,* Delhi: B. L. Publishing Co., 1988.

Singh, R. K., A. K. Singh, K. M. Singh. "Crop Insurance: An overview", *National Bank News Review* 9 (1), 1993.

Skees, J., P. Hazell, M. Miranda. *New Approaches to Crop Yield Insurance in Developing Countries,* Environment and Production Technology Division Discussion Paper No. 55, Washington: International Food Policy Research Institute, 1999.

Subrahmanian, K. K. *Economic Feasibility for Crop Insurance for Coffee,* Unpublished thesis. UAS, Bangalore, 1984.