सामयिक निबन्ध
Occasional Paper - 44

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समस्याएं और सम्भावनाएँ
AGRICULTURAL INSURANCE IN INDIA :
PROBLEMS AND PROSPECTS

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असोसिएट प्रोफेसर

अग्रीकलचर डेव्हलपमेंट और रूरल ट्रान्सफोरमेशंन यूनिट

इन्स्टीटूट फॉर सोशल और इकॉनामिक चेंज (आयएसईसी)

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EXECUTIVE SUMMARY

In India, more than half of the farming is practiced as rain-fed agriculture and is at the mercy of the weather. The technological advances and institutional support have made little impact on risk factor in farm production and done little to raise the risk bearing capacity of the farmers. The insurance agencies have their presence in India for more than 150 years and it is logical that insurance cover should have penetrated into rural areas and covered agriculture sector in a big wa. However, traditinal risk sharing practices do not optimize social welfare and more of the time, implicit insurance premiums are biased against the insured. The farm families do adopt different strategies to adjust the short fall in income. The ex-post measures taken to mitigate the impact of income losses include sale of assets, receive transfers from relatives, borrow for consumption, increase labour participation and even migration for better employment opportunities. However, this impinge on the investment and productin process in the following year.

Agricultural insurance is one method by which farmers can stabilize farm income and investment from the disastrous effect of crop losses due to natural hazards or low market prices. Crop insurance not only stablizes the farm income but also helps the farmers to initiate production activity after the bad agricultural year. Crop insurance forms an important component of safety net programs being implemented in many developed countries, governments often play an active role in helping producers to manage risk successfully. Different products related to agricultural insurance are available in the developed countries. Agricultural insurance has been introduced in many developing countries following different approaches.

Crop insurance programme is being implemented in many developed countries either in public sector or by private sector. In India history of crop insurance (rainfall insurance) dates back to 1930 when Mr. Chakravarti wrote a book on crop insurance and provided practical guide to implement the rainfall insurance to safeguard the farmers from drought. However, the crop insurance was introduced on pilot basis in mid 1970s and thereafter at the national level from 1985-85 on wards.

Considering the overwheling impact of nature on agricultural output and its disastrous consequences on the society in general

and farmers in particular, here an attempt is made to looks at the challenges of providing insurance to Indian agricultural sector in a manner that is both meaningful and sustaining. We present critical assessment of the existing initiative and present possible options for improvement.

Major Findings and Policy Implications

After successful testing of the crop insurance scheme as pilot programme, Comprehensive Crop Insurance Scheme (CCIS) based on homogeneous area approach was introduced at the national level from Kharif 1985. The crop insurance scheme was multi peril insurance in nature as it covered almost all the natural risks.

- Only few major crops (cereals, pulses and oil seeds) were covered under the scheme. The scheme was voluntary in nature in the initial phase but was made compulsory for borrowers. The sum insured was equal to the loan amount borrowed.

- The average number of farmers (holdings) covered under CCIS were less than 5 (4.64) per cent of the total holdings in the country and the average area insured accounted for 4.61 per cent of the gross sown area during the reference period from 1985 through 1999.

- The total indemnity payments were to the tune of Rs. 23038.54 millin as against the premium of Rs. 4035.59 million. Thus the GIC had to pay Rs. 5.71 per rupee of premium collected. The premium rates charged at 2 per cent for cereals and 1 per cent for pulses and oilseeds is too low and do not have any actuarial base.

- The claims paid and premium collected for various crops under CCIS varied significantly. For example, Premium collected for paddy shared more than half of the total premiums whereas claims paid for paddy accounted for a quarter of the total claims paid by GIC during 1985 through 1999. On the contrary, claims paid for groundnut (Rs. 12217 million) accounted for 53 per cent of the total claims when compared with 15 per cent (Rs. 604 millin) contribution to the total premium.

- The homogeneous unit area for determining the threshold yields and assessment of actual yield is too large to be homogeneous considering the variation in soil and weather parameters.

- Insurance cover under CCIS is available to loanee farmers and a large number of farmers who do not borrow from institutional sources are deprived of crop insurance benefits.

In order to address some of the shortcomings in CCIS a new model of crop insurance programme called as National Agricultural Insurance Scheme (NAIS) or Rashtriya Krishi Bima Yojana (RKBY) was launched by the Prime Minister on 23rd June 1999.

- NAIS provides greater coverage in terms of both farmers and crops as non-loanee farmers are made eligible to buy insurance cover. Moreover, insurance is now extended to commercial and horticultural crops.

- It also provides greater coverage of risk as amount higher than crop loan can be insured by paying additional premium.

- Initially, NAIS was implemented in only 9 states and covered 0.58 million farmers and 0.78 million ha. of cropped area in the 9 states. The number of participating states increased to 21 by 2003.

- The total number of 33.82 million farmers and 52.71 million ha., of cropped area was insured under NAIS between 1999 rabi and 2003. The total sum insured was to the tune of Rs. 291.293 billion (291293.43 million). The indemnity payments added up to Rs. 38037 million as against Rs. 8974.36 million during the reference period of 1999-2003.

- The claim premium ratio was 4.24. About 38 per cent of the farmers buying insurance cover received indemnity payments under NAIS.

- As in the case of CCIS, uniform rate of premium across the states and regions discourages states with stable production and leads to adverse selection.

- To ensure viability of NAIS, premiums are to be based on actuarial considerations and the practice of subsidizing premium of small and marginal farmers is to be phased out in 5 years period on sun-set basis.

- Based on the long experience (one and half decade) gained through implementation of CCIS and five years of NAIS, following issues needs attention.

- Area approach should continue considering hobli or revenue village as a homogeneous area for indemnity payments.

- Differential rate of premium based on the variability in yields levels in the past and movement towards premium rates based on actuarial principles. Strive to develop self sustaining model of crop insurance which not only will cover the claims but also cover administrative costs but also generate surplus to absorb shocks in case of catastrophic losses.

- Awareness campaigns to induce non-borrwers to buy insurance covers for major/notified crops.

- It will be more prudent if the expected revenue from the crop (as in United States of America) is insured. This would help the farmers to manage their consumption needs in the event of crop failure.

- Different/innovative insurance products covering different risk needs to be introduced in place of multi peril crop insurance.

- Insurance product based on rainfall or the model suggested by Mr. Chakravarti with some modifications (if required) is worth trying. This will benefit not only farming community but also the landless in the event of adverse deviation in precipitatin in the area.

- Larger coverage of area across varied agro-climatic zones in the country will help to reduce incidence of co-variate risk and losses to the implementing agency.

- The insurance agency should explore the possibility for re-insurance with international insurance agencies to safeguard against the catastrophic losses.

CHAPTER 1 : INTRODUCTION

1.1. Introduction

Farming is inherently one of the riskiest economic activities. Fluctuation in farm income due to variability in crop yields and from commodity prices is one of the most significant features of agriculture. Agricultural production is unstable because of its dependence on weather and inherent biological uncertainties in managing crops. Moreover, the lags in production, the difficulties and cost of storage, uneconomic or heavy transportation costs relative to the price of produce make production highly variable. In addition to this, the response of numerous producers to market signals varies across time and space which leads to fluctuations in the aggregate supply resulting in fluctuations in the market prices. In India, more than half of the farming is practised as rain-fed agriculture and is at the mercy of the weather. The technological advances and institutional support have made little impact on the risk factor in farm production and done little to raise the risk-bearing capacity of the farmers. The insurance agencies have their presence in India for more than 150 years and it is logical that insurance cover should have penetrated into rural areas and covered agriculture sector in a big way. However, the insurance activities were confined to the towns and urban areas.

Agriculture is an important sector in India and it not only contributes to the national income but also provides livelihood to roughly two thirds of the workforce in the country. The fluctuations in agriculture impinge on other sectors of the economy due to its forward and backward linkages. From a social point of view, the problems are more acute when widespread drought or flooding leads to crop failure affecting large number of producers. In this case, the farmers' problem becomes a community problem that affects the welfare of everyone.

The production activities in the industries when compared to agriculture differ as they take place by using known technologies and under controlled conditions unlike agriculture. Schultz (1953) while emphasizing the role of nature in agricultural production states "...In this large area the hand of nature lifts and depresses yields despite all the efforts of farmers to counteract its influence". Diseases as well as insects and pests damage the crops and break of epidemics cause deaths. Diseases and pests also kill and disable valuable livestock often causing losses of great value.

Traditional agriculture is supposed to be rational and efficient. However several studies have noted that the farmers who are rational but poor will be averse to risk and will under-invest in modern techniques that are thought to be more risky than the traditional techniques (Roumasset 1979). Substantial evidence exists about the risk averse attitude of farmers that inhibits maximization of returns from available resources (Dillon and Anderson, 1971; Lin et al, 1974; Binswanger 1978; Hamal and Anderson 1982). The risk aversion of the farmers results in the continuation of traditional practices and cultivation of traditional crop varieties instead of High Yielding Varieties (HYVs), which are assumed to be more risky when compared to traditional or local varieties. In the absence of formal strategies of risk diffusion, farmers do adopt traditional risk minimizing practices like inter/mix cropping, crop diversification or risk sharing strategies through share cropping and tenancy markets and other contractual arrangements (Jodha 1975). The traditional risk sharing practices do not optimize social welfare and most of the time, implicit insurance premiums are biased against the insured.

Indian agriculture is overwhelmingly a small farmers' (operating 2 or less than 2 hectares) enterprise. The small and marginal farmers account for three fourth of the total holdings. The impact of droughts and crop failure may be disastrous for these resource poor small and marginal farmers. The crop failure due to natural calamities like drought, floods or attack by pests and diseases may lead to great hardship. Farmers sell productive assets to meet their regular and contingent consumption needs and this impinge upon the future production (Jodha 1975). The cases of committing suicides by farmers in the event of crop failure or crash in market prices are not uncommon in recent years.

Crop failure reduces employment opportunities in the rural areas leading to welfare loss to the society. It leads to a chain of reaction i.e., loss of income reduces demand for non-farm products by the farmers. Decline in the farm products (used as inputs) creates shortage of inputs in other sectors of the economy and thus the entire economy faces the consequences of agricultural risks of which farmers are the most direct and primary victims. The ad-hoc relief measures taken up by the Government in the face of natural calamities like re-scheduling of loans, supply of seed and other inputs for the following season and other relief measures are benefits and farmers cannot expect these as a matter of right (Ahsan 1985).

India has got a predominantly agrarian population and roughly two thirds of the population is dependent on agriculture for livelihood.. Agriculture is a way of life, a tradition, which, for centuries, has shaped the thought, the outlook, the culture and the economic life of Indians. Agriculture, therefore, is and will continue to be central to all strategies for planned socio-economic development of the country. Rapid growth of agriculture is essential not only to achieve self-reliance at the national level but also for household food security and to bring about equity in distribution of income and wealth resulting in rapid reduction in poverty levels.

Agricultural insurance is one method by which farmers can stabilize farm income and investment from the disastrous effect of crop losses due to natural hazards or low market prices. Crop insurance not only stabilizes the farm income but also helps the farmers to initiate production activity after the bad agricultural year. It forms an important component of safety-net programmes being implemented in many developed countries like USA and Canada as well as in the European Union. There are two major categories of agricultural insurance: single and multi-peril coverage. Single peril coverage offers protection from single hazard while multiple-peril provides protection from several hazards. Fire and hail insurance in Europe and USA are good examples of single peril agricultural insurance. However, in most of the countries, the federal or national government, in collaboration with provincial government, provides multi-peril insurance coverage to the farmers.

A number of changes has been taking place in the financial sector of the Indian economy with the beginning of the process of liberalization in 1991. Insurance, which is one of the important components of financial sector, is a key to resource mobilization. Insurance sector acts as a facilitator to the development of business and commerce as it generates incremental savings in the economy. As stated elsewhere, even after the nationalisation of insurance companies in 1972, insurance business was confined mainly to the urban areas. Even today, out of a population of 1,000 million in India, only 35 to 40 million people are covered by insurance. The potential market is estimated at 200-250 million (Raghunandan 2000). Provision of insurance services tailored to the needs of rural population at cost effective rate will augment growth and development in the rural areas.

In India, multi-peril crop insurance programme is being implemented since 1985. Considering the overwhelming impact of nature on agricultural output and its disastrous consequences on

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the society, in general, and farmers, in particular, here an attempt has been made to study the role of insurance in agricultural and rural development. The present study looks at the challenges of providing insurance to the Indian agricultural sector in a manner that is both meaningful and sustaining. We present a critical assessment of the existing initiative and present possible options for improvement.

1.2.   Objectives

◆ To study the need, coverage and issues involved with crop insurance

◆ To study the various phases of crop insurance in the country.

◆ To analyze the various approaches and economic viability of crop insurance

◆ To suggest ways and means to improve the crop insurance scheme.

1.3.   Methodology and Data

This study is based on an analysis of secondary data. Required data on crop insurance at the national level were collected from the General Insurance Corporation (GIC) of India Ltd. New Delhi, whereas crop insurance data for Karnataka State were collected from the office of the GIC of India Ltd, Bangalore. The data have been analyzed and presented using simple averages and tabular analysis.

Following the introduction and methodology, we present features of Indian agriculture in section II. A brief review of the literature related to risk/uncertainty and crop insurance has been presented in section III. The analysis of the major types of risk in agriculture and management strategies of farmers has been presented in section IV followed by the need for agricultural insurance in section V. This is followed by section VI on approaches to crop insurance. We discuss the phases of development of crop insurance schemes in section VII followed by objectives, coverage, etc. of comprehensive crop insurance scheme (CCIS) as well as Rashtriya Krishi Bima Yojana (RKBY) in sections VII and VIII, respectively. Section IX presents a case study of Karnataka, coverage of CCIS by district and farm size categories in Karnataka. A brief discussion about other insurance schemes has been presented in section X and finally, we conclude by providing summary and policy implications in section XI. References and annexure follow next.

CHAPTER 2 :
INDIAN AGRICULTURE, MAJOR RISKS AND
ITS MANAGEMENT

2.1. Characteristics of Indian Agriculture

At the time of independence, the agricultural economy of the country was characterized by a stagnant economy with wide regional diversities, lower resource availability, inadequate institutional support and acute poverty.

The period prior to independence was marked by the retrogression of agriculture sector and ended by leaving the country with perhaps the world's most refractory land problem (Thorner and Thorner 1958). Land reforms were taken up as an immediate measure to correct the skewed distribution of land and inadequacies in the land market. Land reforms were directed towards favouring the peasant cultivator through tenancy reforms, abolition of intermediaries and bringing equity in access to land and other resources.

Laws of inheritance and land fragmentation led to marginalization of agriculture. Indian agriculture is characterized by small holdings and farmers operating less than one hectare of land accounted for roughly 60 per cent of the more than 106 million farming families in 1990-91, operating just 15 per cent of the total area. In addition to this, another 20 million families operate between 1 to 2 hectares of land and they share roughly one fifth of the total holdings (GOI 2001).

The community Development (CD) Programme initiated in 1952 for the development of villages by co-ordination of the activities related to agriculture, animal husbandry, infrastructure and extension at block level helped creating rural infrastructure across blocks. National Extension Service programme was also initiated along with the CD programme.

The emphasis from the sixties onwards was to increase agricultural production. This had a twin goal: first, to make India self-sufficient in foodgrain so that its food security was assured and second, to ensure that farming activity brought prosperity to the farmers and raised them above the level of subsistence to which most of them were accustomed.

The sixties witnessed two important interventions in agricultural development. One, in the form of Intensive Agricultural District Programme (IADP) of 1960-61 for selected districts in the country and the other, as Intensive Agricultural Area Programme (IAAP) of 1964-65.

In the following years, we witnessed the advent of green revolution. The HYV seed, fertilizer and irrigation technology helped boost foodgrain production in the country in the following years. The impact of technological change was felt throughout the country but more vigorously in a few states and for a few crops.

Commercialization of agriculture is not a new phenomenon. Crops like cotton, sugarcane, jute and tobacco are being grown since time immemorial. However, commercialization accelerated during the last two decades. The area under foodgrain crops is being substituted by non-foodgrains / cash crops (Annex Table 1).

Subsistence farming where the farming family essentially tilled the land to produce something for its own consumption was from a business standpoint, a low risk activity. The system was characterized by lower dependence on purchased inputs (like seed, fertilizer, plant protection chemicals and even labour). However, this may not be so any longer and even small and marginal farmers are responding to market signals. The proportionate area allocated for foodgrain crops is being replaced by cash crops (Annex Table 2) and this has very great implication for crop insurance. Farmers try to maximize the expected net income and at the same time try to minimize their dependence on market for staple food. Thus, they choose a mix of staple food crops and cash crops. Staple food crops (mainly cereals) also provide fodder for livestock, which is an indispensable asset with the poor.

2.2. Principal Risks and Management Strategies of Farmers

2.2.1. Types of risks

The risks in agriculture can be grouped as : (i) production risk" (ii) market risk; (iii) financial risk; (IV) legal/policy risk; (v) resource risk; (vi) health risks; and (vii) assets risks. The intensity and domination of risk varies widely across regions. For example, production risks are more dominant in arid and semi-arid rain-fed regions when compared to the regions having assured rainfall or irrigation facilities. The natural risk or production risk arises due to

vagaries of nature like variability in rainfall, excessive or deficiency of moisture or drought, adverse weather conditions (hail and frost), and disease and pest infestation. Development and adoption of innovations also add to production risk in agriculture. Variability in agricultural production due to uncertainties of weather is one of the peculiarities of agriculture.

The market risks result from fluctuations in the prices of inputs and outputs, outside competition, changing supply and demand, market imperfections, changing consumer preferences, etc. Though the Government of India declares Minimum Support Prices (MSP) for major crops, the scheme is effective only in the case of paddy and wheat. Government intervention in commodity market is rare in respect of other agricultural commodities even when market prices are below the MSP. Moreover, market imperfections are rampant even within the so called regulated markets (Agricultural Produce Marketing Committee (APMC) monitored markets). The differences in the prices between two markets within a small geographical area are significant (Deshpande and Naika 2002). The farmer may resort to distress sale because he may need money very badly or have perishable produce for sale. Sale of farm produce under distress may take place due to lack of post harvest processing and storage facilities also. Marketing/price risk is important especially after economic liberalization and accelerated commercialization of agriculture. With the removal of quantitative restrictions on imports into India under WTO agreement, price risks are likely to grow, as domestic prices will be aligned to international prices for exportable commodities.

The financial risk emanates due to the inability to meet cash flow needs, casualty losses, bankruptcy, and cost and availability of credit. The legal and policy risk arises due to changes in the government policies related to agriculture, failure to comply with contractual obligations, etc. There are two classic examples of policy risks faced by the farmers. With the introduction of technology mission on oilseeds, the government actively promoted cultivation of palm oil. However, liberal import of oil proved detrimental to the domestic oil industry and farmers started up-rooting palm plantations. Similar case is the government banned export of onion to check rising prices of onions in the domestic markets. However, this ban continued for much longer than required and thus, harming the interests of the farmers.

The resource risks include uncertain supply or non-availability of labour (skilled labour), credit and irrigation water and also timely supply of desired seed, fertilizer or plant protection chemicals. Supply of spurious seeds and plant protection chemicals pose a great risk to the producers. Failure of crops due to sub-standard seed or spurious plant protection chemicals causes drain of resources of the farmer. It inflicts considerable damage on the psyche of the farmer some times leading to suicides by the farmers. The health risk arises due to sickness or injury to the farmer, low labour productivity due to poor labour management, family disputes, accidental death, etc. Finally, assets risk emanates from theft or fire damage to buildings, machinery and livestock.

The risk can be classified as systemic or covariate (they are common to large group of producers) and idiosyncratic or specific (individual specific) depending upon the localization. Droughts, floods and cyclones no doubt represent systemic or covariate risks. However, the thunder or hailstorms may have localized effect and may be confined to smaller area or to a few farmers. The risk arising due to rainfall has many attributes like the relevance of the onset of rainfall, intensity and distribution of rainfall and they differ depending upon the crop regime, soils and the regions. The damaging impact of unusual rain varies depending on the location, timing and intensity as well as the crops being cultivated. The distinction between systemic and idiosyncratic risks is important from the point of view of facilitating risk pooling and insurance arrangements (formal or informal).

2.3. Risk Mitigating Strategies

In order to cope with various risks, farmers and rural societies have developed number of risk management strategies. These can be grouped as risk-reducing and risk-coping strategies (Walker and Jodha 1986). The ex-ante measures adopted to lower or minimise risks can be grouped as risk-reducing strategies whereas ex-post measures adopted to mitigate risks are classified as risk-coping measures or strategies.

2.3.1. Risk-reducing strategies (ex-ante)

Risk-reducing strategies adopted by farmers include crop diversification, inter-cropping /mix cropping, or cultivation of drought or flood resistant crops. Diversification of activities, engaging in non-farm/off-farm activities, getting into contractual arrangements such

as share cropping, labour hiring, etc. also forms a part of ex-ante risk mitigating strategies. Crop diversification is regarded as the most common and effective risk management strategy that is employed by the farmers. In diversification, the farmer spreads risk across multiple crops and even if one crop fails, it is compensated by another crop. However, crop diversification leads to spreading of limited resources across crops and the price paid for diversification is income foregone or sacrificed by not growing the most remunerative crop. The same argument holds true in the case of intercropping also.

Intercropping lowers yield risks because of lower incidence of insect/pest damage as well as disease. Intercropping has greater potential for yield compensation. It also provides opportunity to grow short duration crops along with long duration crops thus minimising competition for soil nutrients and maximising the use of soil moisture, sunlight, etc. Even though intercropping was not found effective in reducing production risk as shown by positive covariance between the yield of inter crops (Walker and Jodha 1986), it certainly helps in avoiding complete crop failure (Singh and Walker 1984). Tenancy or share-cropping helps to minimize risk in production. Sharecropping is most popular in drought-prone area. Share cropping arrangement is more beneficial particularly when the tenant is a small farmer and averse to risk, as the tenant has to share a fraction of output to the land owner and he is insulated against the fluctuations in output. On the contrary, ease or fixed tenancy shifts the entire risk of production to the tenant farmer. Risk-reducing strategies can be quite effective in addressing production as well as marketing risks (Hazell et al, 1983; Low 1974). The risk-reducing strategies stabilizes farm income but at the same time the farmer has to forego income from other alternative activity, which would have fetched higher income. Similarly, diversification is usually less profitable on average than crop specialization ((Hazell 1992).

Labour markets provide alternative mechanisms to deal with risk. The small and marginal farmers or farmers with larger labour force can shift from own cultivation to labour market to avoid uncertainties of slack season. Many small and marginal farmers along with landless workers enter into long-term labour contracts as permanent farm servants.

2.3.2. Risk-coping Strategies

Farm families adopt different strategies to adjust the shortfall in income. The ex-post measures taken to mitigate the impact of income losses include sale of assets, stored produce, receipt of transfers from relatives, borrowals for consumption, increase labour participation and even migration for better employment opportunities. It is observed that relatively large landholders tend to use crop inventory (buffer stocks) while relatively small and landless holders tend to use currency to smoothen shocks in income. Walker and Ryan (1990) explain that larger farmers are better equipped to store grains across seasons than poor farmers who find it easier to sell the grains upon harvest and use the currency as smoothing mechanism. Jodha (1981) finds that most common asset sale during droughts is that of livestock followed by jewellery.

- The second major form of smoothing consumption is taking loans from formal and informal sources. It is a well documented fact that institutional credit is available as working capital or as production credit to meet the variable expenses on inputs and for investment purpose. The formal institutions do not extend consumption loans to tide over bad times. They generally reschedule the repayment in the event of general crop failure. Along with formal credit agencies or institutions, a well-developed traditional money-lending system still exits in most parts of rural areas of the country. Farmers are associated in a personalized long-term relationship extending over several years with a single moneylender. These moneylenders, unlike formal creditors, explicitly lend for consumption as well as for production. The traditional risk-coping strategies are effective in addressing idiosyncratic risks like accident, theft etc., as these are independently distributed across the people. Traditional risk-coping mechanisms cannot deal effectively with the co-variability problem. For example, financial assistance in the form of transfers or loans from relatives and friends may not come forth as production and price risks affect nearly all the farmers simultaneously within a small rural community. Similarly, borrowing for consumption is costly when risk affects large population in the area. Lack of tangible assets makes informal credit more popular among the poor. Liquidation of assets also fetches low price during crisis as number of farmers tries to sell at the same time. However, replenish/replacement of assets takes time after the catastrophic event as prices are jacked up

through mutual competition. Agricultural insurance institutions are expected to provide more efficient risk management tools to deal with both idiosyncratic as well as systemic or covariate risk faced by the farming community (Ahsan 1985; Ray 1967). We present the rationale for agricultural insurance and issues involved in the following section.

CHAPTER 3 :
NEED FOR AGRICULTURAL INSURANCE
AND ISSUES INVOLVED

3.1.   Issues and Need for Insurance

As stated earlier, production process in agriculture is entirely different than in other industries. It has been observed that the variability and instability in foodgrain production has increased in the post-green revolution period when compared to pre-green revolution period (Hazell 1982; Ray 1983, Rao et al, 1988). The crop output, particularly foodgrains, is sensitive to variations in rainfall. Secondly, there is very high complementarity between rainfall and input use particularly fertilizer application. In the year of deficient rainfall, crop yields go down steeply because of deficient soil moisture and significant reduction in the use of inputs. Moreover, Kharif crops are more sensitive to rainfall when compared to rabi (post-monsoon) crops. The instability in foodgrains output increased sharply in the states like Gujarat, Maharashtra, Karnataka and Orissa during 1971-85. These states are characterized by low and erratic precipitation and lacks assured source of irrigation. Crop output has become more sensitive to rainfall in the post-green revolution period. (Rao et al, 1988).

In the absence of formal risk sharing/diffusing mechanisms, farmers relay on traditional modes and methods to deal with production risk in agriculture (Ruthenberg 1976; Collison 1972; Norman 1974; Haswell 1973; Navarro 1977). Many cropping strategies and farming practices have been adopted in the absence of crop insurance for stabilizing crop revenue. Availability and effectiveness of these risk management strategies or insurance surrogates depend on public policies and demand for crop insurance (Walker and Jodha 1986).

The risk bearing capacity of the average farmer in the semi-arid tropics is very limited. A large farm household or a wealthy farmer is able to spread risk over time and space as he can use stored grains or savings during bad years. He can diversify his crop production across different plots. At a higher level of income and staying power, the farmer would opt for higher average yields or profits over a period of time even if it is achieved at the cost of high annual varia-bility in output (Rao et al., 1988). Binswanger (1980), after studying the risk in agricultural investments, risk averting tendencies of the farmers and available strategies for shifting risk, concludes that

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farmers' own mechanisms for loss management or risk diffusion are very expensive in arid and semi-arid regions.

Since agriculture is faced with risk and uncertainties, farm income fluctuates due to variability in crop yields and commodity prices. This leads to great hardship to the farmers. Even the experience of the Great depression of the 1930s contributed to the view that government policies should be used to reduce uncertainty faced by the farmers in agriculture. Ruttan (1969) summarises this argument: "The rationale for public intervention in agricultural commodity market is, and will continue to be ...... to lend stability to an industry which technological and economic forces should render chronically unstable in the absence of such interventions".

The major role played by insurance programmes is the indemnification of risk-averse individuals who might be adversely affected by natural probabilistic phenomenon. The philosophy of insurance market is based on large numbers where the incidence of risk is distributed over individuals. Insurance, by offering the possibility shifting risks, enables individuals to engage in risky activities which they would not undertake otherwise (Ahsan et al., 1982). A statement by Arrow (1971) is very revealing in this context. Arrow states 'I may well hesitate to erect a building out of my own resources if I have to stand the risk of its burning down; but I would build if the building can be insured against fire' (Arrow 1971).

Individuals cannot influence the nature and occurrence of the risky event. The insurance agency has fairly good but generalized information about the insurer. However, this does not hold true in the case of agriculture or crop insurance. Unlike most other insurance situations, the incidence of crop risk is not independently or randomly distributed among the insured. Good or bad weather may affect the entire population in the area.

Lack of data on yield levels as well as risk position of the individual farmer puts the insurance company in tight spot. As in the case of general insurance, agricultural insurance market also faces the problem of adverse selection and moral hazard. The higher premium rates discourage majority participation and only high risk clients participate leading to adverse selection. Moreover, in crop insurance, the individuals do not have control over the event, but depending on terms of contract, the individuals can affect the amount of indemnity. Tendency of moral hazard tempts an insured individual to take less care in preventing the loss than an uninsured

counterpart when expected indemnity payments exceed the value of efforts. The imperfect information (gathering information is costly) discourages participation of private agencies in crop insurance market. Similarly, incidence of random events may not be independent. Natural disasters may severely damage crops over a very large area and the domain of insurance on which it is based crumbles down i.e., working of the law of large number on which premium and indemnity calculations are based breaks down. The private insurance companies of regional nature will go bankrupt while paying indemnity claims unless it spread risk over space.

The natural risks and hazards impinge on the decision-making of the farmers. Crop failure affects the borrowers, creditors and also a vast cross-section of the population. Hence, crop insurance can be viewed as an institution of security (Ahsan 1985). In many countries, all-risk agricultural insurance is provided by the public agencies as a matter of public policy. Turvey (1991) argues that agricultural insurance is one method by which farmers can protect and stabilize farm income and investment from disastrous effect of crop losses due to natural hazards or low market prices. Agricultural insurance can encourage farmers to make decisions in allocating their resources and choosing profitable combinations of risky crop enterprises. It also protects the farm against risk from adoption of new production practices, variability in farm commodity and input prices and other related variables that destabilise the farm income levels.

The market orientation of agriculture, on the one hand, undeniably brings prosperity to farmers and on the other, it increases risks in the farming business. The farmer's main goal is to sell his production surplus and maximize his profits, which is surplus over and above his investment. In order to augment profit, the farmer has to increase his production/marketable surplus. In order to increase output, necessary investments have to be made in inputs. These could be both long-term; as in land leveling or development of irrigation, or short-term such as crop loans for purchasing seeds, fertilisers and pesticides. Farming or crop production being a biological process, converting input into output carries the greatest risk in farming. This, coupled with market risk, impinges on the profits expected from farming.

The new agricultural policy declared by the government recently acknowledges that the condition of the farmers continues to be unstable due to natural calamities and price fluctuations despite

technological and economic advancement. The policy proclaims that an endeavour would be made to provide a package insurance policy for the farmers to insulate them from financial distress caused by natural disasters. Crop insurance is one of the risk management solutions to smooth consumption against income fluctuations. Borrowing by individuals from formal or informal markets smoothens consumption over time whereas insurance smoothes consumption across households through risk sharing and risk pooling. Insurance is expected to play a role as collateral security for the asset poor small and marginal farmers in the credit market.

Efficient risk reducing and loss management strategies such as crop insurance would enable the farmer to take substantial risks without being exposed to hardship. Access to formal risk diffusing mechanisms will induce farmers to maximize returns through adoption of riskier options. Investment in development of ground-water, purchase of exotic breeds for dairy will be encouraged due to insurability of the investment. This will help the individual to augment and increase the farm income (micro perspective) and also help to augment aggregate production in the country (macro perspective). The benefits of crop insurance vary depending on the nature and extent of protection provided by the scheme.

3.2. Review of Agricultural Insurance Literature

- It is argued that farmers' own measures to reduce the risk in farming in semi-arid tropical India were costly and relatively ineffective in reducing risk in farming and to adjust to drought and scarcity conditions. The riskiness of farming impinges upon the investment in agriculture leading to sub-optimal allocation of resources (Jodha 1978). Jodha finds that official credit institutions are ill equipped to reduce the exposure of Indian farmers to risks because they cannot or do not provide consumption loans to drought-affected farmers.

- It absorbs the shock of crop failure by providing cushion wherein farmer is assured of minimum protection against various natural calamities. Moreover, crop insurance provides right to seek compensation rather than requesting for gratis from the government in the event of crop failures. Thus, crop insurance will help maintain the dignity of the farmer. Even in the years of crop failures, crop insurance assures farmers decent living from their own efforts and not by charity (Ahsan 1985).

- Crop insurance is based on the principle of large number. The risk is distributed across space and time. The losses suffered by farmers in a particular locality are borne by farmers in other areas or the reserves accumulated through premiums in good years can be used to pay the indemnities. Thus, a good crop insurance programme combines both self as well as mutual help principle. Crop insurance brings in security and stability in farm income.

- Crop insurance protects farmers' investment in crop production and thus improves their risk bearing capacity. Crop insurance facilitates adoption of improved technologies, encourages higher investment resulting in higher agricultural production.

- Crop credit insurance also reduces the risk of becoming defaulter of institutional credit. The reimbursement of indemnities in the case of crop failure enables the farmer to repay his debts and thus, his credit line with the formal financial institutions is maintained intact (Mishra 1996; Pomareda 1986; Hazell et al. 1986). The farmers do not have to seek loans from private moneylenders. The farmer does not have to go for distress sale of his produce to repay private debts. Credit insurance ensures repayment of credit, which helps in maintaining the viability of formal credit institutions. The government is relieved from large expenditures incurred for writing-off agricultural loans, providing relief and distress loans etc., in the case of crop failure.

- In India, more than two third of the land holdings are less than 2 hectares. The average size of holding is less than 1.55 hectares and more than half of the arable area is rain-fed and output from agriculture is largely conditioned by the monsoon. A properly designed and implemented crop insurance programme will protect the numerous vulnerable small and marginal farmers from hardship, bring in stability in the farm incomes and increase the farm production (Bhende 2002).

- However, the existing model reduces the burden of debt repayment in the event of crop failures, and it neither provides any help to meet the consumption needs nor augment income due to crop loss. The present scheme helps sustain viability of the credit institutions rather than the farmer per se. Nevertheless, crop insurance enhances the

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confidence of the farmers and encourages adoption of improved technology and investment in agriculture.

- Insurance acts as complementary to other agricultural risk shifting measures such as credit, irrigation, soil conservation etc. The spread of green revolution technology in better-endowed regions and better-off farmers benefit from it (Frankel 1971; Saini 1976). The small and marginal farmers could not adopt improved technology due to fear of crop failure despite availability of credit (Ahsan 1985).

- The farmer is likely to allocate resources in profit maximizing way if he is sure that he will be compensated when his income is catastrophically low for reasons beyond his control. A farmer may grow more profitable crops even though they are risky. Similarly, farmer may adopt improved but uncertain technology when he is assured of compensation in case of failure (Hazell 1992). This will increase value added from agriculture, and income of the farm family.

- Access and availability of insurance changes the attitude of the farmer and induces him to take decisions which, otherwise, would not have taken due to aversion to risk. For example, rain-fed paddy was cultivated in one of the riskiest districts i.e., Anuradhapur district, of Sri Lanka, for the first time in 1962, as insurance facility was available to the farmers (Ray 1971).

- Bhende (1992), has found that income of the farm households from semi-arid tropics engaged predominantly in rain-fed farming was positively associated with the level of risk. Hence, the availability of formal instrument for diffusion of risk like crop insurance will facilitate farmers to adopt risky but remunerative technology and farm activities, resulting in increased income.

- Richards (2000) has studied crop insurance proposals concerned with reforms in the US federal Multiple-Peril Crop Insurance Program for specialty crops. It has raised concerns that a higher cost for catastrophic-level coverage would significantly reduce programme participation. The demand estimates for three levels of insurance coverage (50%, 65%, 75%) based on aggregate data from grape producers in 11 California counties for the period 1986-96 indicated that the

price-elasticity of demand for 50 per cent coverage was elastic, suggesting that premium increases may indeed reduce participation significantly. Such increases may also cause a significant reallocation of growers among coverage levels.

- Kurnosov_and Kamalyan_ (2000) have studied risk factors in the planning and development of agricultural policy. "Risk factors involved in farming include the instability of yields and farm incomes, the occurrence of natural disasters and their effects on production and costs, and the need to make investments and allocate resources well before actual yields and prices are known. In developed countries, governments often play an active role in helping producers to manage risk successfully.

- Instability in prices and yields may not represent serious problems in countries where expenditure on food accounts form a relatively small proportion of household budgets. However, more serious problems occur in countries such as Russia where much of the population has low incomes and it is more difficult for consumers to cope with high food prices. Government policies that may be used to manage such risks are discussed, covering: "social" investment in developing agricultural and food production, stabilization of prices, subsidized crop insurance programmes, and alleviating the consequences of natural disasters.

- A feasibility study has been carried out of some form of income insurance for European crop and livestock farmers. It is concluded that insurance schemes provide good opportunities for farmers to deal with 'new' risks in agriculture. Among various possible forms of income insurance, only revenue insurance is considered feasible because of asymmetric information. Furthermore, revenue insurance is only considered applicable to field crops.

- The redirection of farm policy in the 1996 farm bill has generated much interest in seeking environmentally friendly and economically viable ways to protect farm income. Agricultural insurance has been suggested as such an instrument. Wu (1999) has estimated the effect of crop insurance on crop mix and the resulting change in chemical use in the Central Nebraska Basin. He has found that providing maize insurance would shift land from hay and

pasture to maize, which will increase chemical use at the extensive margin. This extensive-margin effect dominates the effect of crop insurance on the application rate leading to an increase in total chemical use.

- A study undertaken by Torkamani (1998) to analyze the effects of agricultural crop insurance on productivity and risk attitude of farmers in Kavar district, Fars province, Iran, reveals that technical efficiency of insured group, on an average, was higher compared with non-insured group. The mean levels of technical efficiencies were 73.80 per cent and 65.09 per cent for insured and non-insured groups, respectively.

- Some of the studies confirm the conventional view that moral hazard incentive lead insured farmers to use fewer chemical inputs (Smith and Goodwin 1996). Babcock and Hennessy (1996), find that at reasonable levels of risk aversion, nitrogen fertilizer and insurance are substitutes, suggesting that those who purchase insurance are likely to decrease nitrogen fertilizer applications.

- However, Quiggin (1991) suggests that it is theoretically possible that moral hazard incentives may induce farmers to increase the use of agricultural inputs that increases dispersion of the distribution of crop yields.

- A study by Horowitz and Lichtenberg (1993) support the theoretical argument of Quiggin. They find that in the US Midwest, crop insurance exerts considerable influence on maize farmers' chemical use decisions. Those purchasing insurance applies significantly more nitrogen per acre (19%), spend more on pesticides (21%), and treats more acreage with both herbicides and insecticides (7% and 63%) than those not purchasing insurance. These results suggest that both fertilizer and pesticides may be risk-increasing inputs.

- An analysis of data from US agriculture indicates that the producer's first response to risk is to restrict the use of debt. Price support programmes and crop insurance are substitutes in reducing producer risk. The availability of crop insurance in a setting with price supports allows producers to service higher levels of debt with no increase in risk (Atwood, Watts and Baquet 1996).

- Mishra (1994) analyzed the impact of a credit-linked crop insurance scheme (CCIS) on crop loans, especially to small farmers in Gujarat. It is observed that CCIS had a collateral effect as reflected through the increased loan amount per borrower and reduction in the proportion of non-borrowers among small farmers. The implications of credit expansion are that increased availability of credit can enhance input use and output and employment that increased share of small farmers in the total loan can have desirable effects on equity and efficiency considerations.

- Though crop insurance is based on area yield, it insures the loan amount. This leads to improved access of small and marginal farmers to institutional credit. In the event of crop failure or drought, loan is repaid in the form of indemnity and thus there is reduction in the cost of recovery of loans to lending institutions and reduction in the overdue and defaults.

- Crop insurance generates positive externalities to the community in the form of increased employment and also lower prices for agricultural commodities due to increased production.

- It is observed that insured households invest more on agricultural inputs leading to higher output and income per unit of land. Interestingly, percentage increase in output and income is more for small farms. Dased on 1991 data, CCIS was found to contribute 23, 15, and 29 per cent increase in income of insured farmers in Gujarat, Orissa and Tamil Nadu, respectively (Mishra 1994).

- Access to crop insurance also tends to encourage adoption of riskier but more profitable crops, irrespective of whether such crops are covered by the insurance package or not. Surprisingly, the income gain of insured farmers (over their non-insured counterparts) is higher from crops not covered by insurance scheme when compared to income gains from insured crops (Mishra 1994).

Many of the risks insured under public insurance programme are essentially un-insurable risks. Moreover, they occur frequently and hence are expensive to insure. The financial performance of most of the public crop insurance has been ruinous in both developed and developing countries. The multi-peril crop insurance thus is very expensive and has to be heavily subsidized (Hazell 1992).

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CHAPTER 4 :
HISTORY OF CROP INSURANCE AND APPROACHES FOLLOWED

4.1. History of Crop Insurance

Crop insurance originated a century back in the United States of America. The first attempt of providing multiple-peril crop insurance was made in 1899 by a private company, Realty Guaranty Company of Minneapolis. However, the company discontinued the programme after a year (Hoffman 1925). Similar attempts were made during 1917 by three private companies in North Dakota, South Dakota and Montana and suffered heavy losses because of drought (Valgren 1922). Many other companies entered into the field of crop insurance and vanished over time. Finally, Federal Crop Insurance Act was passed in 1938 and Federal Crop Insurance Corporation (FCIC), an agency within the U.S. Department of Agriculture, was established to implement the crop insurance programme in USA. Wheat was the first crop that got insurance cover in 1939 under the federal multi-peril crop insurance policy. Since 1939, although, the participation rates have increased steadily, the overall performance of the federal crop insurance programme proved to be disappointing. Loss ratios for the entire programme has been found to be substantially higher than 1.0, indicating serious problems with the scheme.

Federal crop insurance programme was actually terminated for a short period of time in early 1940s and then reemerged in mid 1940s with limited coverage available for only a few crops in a limited number of counties. The U.S. Congress passed an amendment in 1947 and the programme expanded gradually into new counties and new crops. Now, the federal crop insurance is available for over fifty different crops in 3,000 counties across the United States. It covers all natural risks, including losses from droughts, excessive rain and storm damage (Miranda 1991). Further, the Federal Crop Insurance Act (FCIA) of 1980 has made significant changes in the scope and objectives of U.S. crop insurance programmes. This Act was aimed at creating an insurance programme that would replace USDA's disaster assistance programmes while operating on actuarially sound basis with limited government financial assistance. Under the provisions of the 1980 Act, the private companies market crop insurance. Premiums are subsidized and participating private insurance companies can get reimbursement for their administrative expenditure and for a part of their

underwriting losses. The farmer has an option either to go for crop yield insurance or revenue insurance. The former takes care of shortfall in crop yields whereas the latter combine both yields as well as price risk. Under this Act, a farmer can purchase individualized coverage for 50 per cent, 65 per cent or 75 per cent of the normal yield and choose one of the three elected price levels. If producer's actual yield falls below the elected yield coverage level, he receives, per insured acre, an indemnity equal to the yield short-fall times the elected price level. At the 50 and 60 per cent yield coverage levels, the subsidy is equal to 30 per cent of premiums and at the 75 per cent coverage level, the subsidy is about 19 per cent of the premium. Since 1980, a rough estimate of the average subsidy level for the entire programme would be about 25 per cent (Skees 1987).

In spite of the changes brought about by the 1980 Act, the rate of participation in the Federal Crop Insurance Program averaged 27 per cent of insurable acres for all crops in the U.S. during 1985-1990. Low participation rate indicates that the programme is not fulfilling the objective for which it was designed under the Federal Crop Insurance Act of 1980. Concerns have been raised regarding the actuarial soundness and limited participation of the programmes (Goodwin 1993; Miranda 1991, Vandeveer and Loehman 1994). From 1980 to 1990, U.S. farmers received, on an average, $ 1.88 in indemnities for each dollar they paid in premiums. The government outlays for the federal crop insurance program during 1980-90 exceeded $6.1 billions, accounting for over 80 per cent of the total indemnities paid to the producers. The 1990 Farm Bill proposed for repealing of the Federal Crop Insurance Programme and replacing it with several disaster assistance programmes owing to limited participation rate in Federal Crop Insurance Programme. However, these proposals were not adopted in the final legislation and multiple peril crop insurance was retained as a safety-net programme in U.S.A.

Repeated attempts have been made by the Canadian farmers since the early 1920s to obtain some form of systematic protection against the effects of highly variable and uncertain crop yields (Federal Task Force on Agriculture 1969). In western Canada, in the 1920s, a private insurance company entered into crop insurance business but after a short but costly experience quit the business. In 1939, Prairie Farm Assistance Act (PFAA) was introduced by the Canadian government as an early attempt in the field of crop insu-rance. This Act provided limited protection to the grain producers in

the Western Canada but it provided no protection to farmers producing other crops or to grain producers in other provinces. A one per cent levy was placed by the PFAA on all grain marketed through the Canadian Wheat Board. If the yields fell below the specified level, all producers of that township who grew the crops received an indemnity. The maximum amount of an indemnity that an individual farmer would receive was not more than $800.00 per year. During 1939 to 1968, the total levy collected was $196 million while the total indemnities paid to the producers was nearly $370 million dollars and the average loss ratio for the programme was estimated as 1.88 (Report of the Federal Task Force on Agriculture, 1969 as quoted in Islam, 1996).

All risk crop insurance is available to Canadian farmers on voluntary basis under the Federal Crop Insurance Act (FCIA) of 1959. This Act enabled the federal government to provide crop insurance in a particular province by making an agreement with the province. All the 10 provinces in Canada are actively participating in the crop insurance programme through cost sharing agreements with the federal government. The provinces have substantial flexibility in designing their own crop insurance policies under FCIA. Currently, 25 per cent of the farmers' premiums and 50 per cent of provincial administrative costs are contributed by the federal government. On the other hand, if the provinces pay all the administrative costs, the federal government will contribute 50 per cent as the premium subsidy. Most of the provinces choose the latter alternative except Quebec and Newfoundland. The federal government also provides loans to provincial crop insurance commissions as a reinsurance agreement if indemnities exceed cash reserves. The all risk and individualized crop insurance programme is provided to Canadian farmers in all provinces except in Quebec under this Act. A plan similar to area-yield crop insurance was undertaken in Quebec in 1977.

The crop insurance programme covered over 43 million acres of farm crops since its inception in 1959 till 1994 and paid indemnities to the tune of $4.4 billion. The average loss ratio (indemnities paid/ premiums paid by farmers) for Canada was estimated as 2.03 without administrative costs and 2.37 with administrative costs during 1974-94. In other words, Canadian farmers received an average of $2.03 for every dollar contributed as premium for crop insurance over a period from 1974 to 1994. The total premium revenue was $3.9 billion as against $4.4 billion paid as indemnities during 1959 to 1994. The cumulative loss ratio was 1.13. The loss ratio in any

given year was more than unity. Of course, the average loss ratio varied across provinces and over time. The average public cost of the crop insurance programme per insured acre has been estimated as $19.89 over 1974 to 1994 period (Islam 1996).

Most of the developed countries have devised different models of insurance to safeguard the interest of the farmers. For example, in Europe, the farmers are protected through the National Fund for Agricultural Calamities or Catastrophic Fund. The National Calamity fund is in place in the EC countries since 1964 and is used to compensate the farmers for losses due to natural calamities. Catas- trophic fund covers the losses caused by rare events, which have devastating impact on the lives of the farmers. The insurance against catastrophic events was introduced in 1982. In addition to Natural Calamities Fund and catastrophic fund, insurance facilities are available from private sector to cover different types of risks such as hail insurance, fire insurance, etc. Most of the insurance operations for agriculture are financed through tax revenue and state budgetary support.

In Japan, crop insurance proposals were first debated in the Diet during 1920 and after a prolonged debate on the subject, Agricul- tural Insurance Law was enacted in 1938. The crop insurance scheme was implemented from April 1939 and provided nationwide coverage for paddy rice, wheat, barley and mulberries (Yamauchi 1986). The Agricultural Insurance Law was amended after the Second World War in 1947. This amendment provided multi-peril insurance and at the same time, increased subsidy from 15 per cent of the premium to about one half.

4.2.   Development of Crop Insurance in India

As elsewhere in the world, policy makers in India were also concerned about the risk and uncertainty prevalent in agriculture. Work on crop insurance received much attention after India's independence in 1947. However, crop insurance was conceptualized and J.S. Chakravarti presented a practical scheme suited to Indian conditions as early as 1920. A book entitled Agricultural Insurance: A Practical Scheme Suited to Indian Conditions was published in 1920. He proposed a rain insurance scheme for the Mysore State to protect farmers against vagaries of monsoon culminating in drought. The subject of crop insurance was discussed in the Parliament (Central Legislature) the 1947 and the then Minister of Food and Agriculture, gave an assurance that the feasibility of introducing crop

and livestock insurance would be considered by the government. Two pilot schemes on crop insurance, prepared by Mr. G.S. Priolkar, an officer on special duty, were circulated to the states for adoption. However, none of the states agreed to implement the schemes, mainly due to paucity of funds. The interest in the subject was rekindled during the Third Five Year Plan (1961-66). However, the Working Group on Agriculture was averse to include crop insurance in the plan. At the same time the government of Punjab proposed the inclusion of crop insurance in its state plan and sought financial assistance from the central government. The state government could not introduce crop insurance as the powers to pass the legislation related to insurance were vested with the central government. Following these developments and increasing demand for crop insurance, in 1965, the Government of India decided to have a Crop Insurance Bill and Model Scheme of Crop Insurance was formulated so that the interested States could introduce Crop Insurance in the area under their jurisdiction. A Draft Bill and Model scheme were prepared and circulated to the states to elicit their views and comments on the same. Further, incorporating the comments and views of the states, the Government of India in March 1970 considered the Draft Bill and the Model Scheme. The Draft Bill and the Model Scheme were then referred to the Expert Committee (under the Chairmanship of Dharm Narain) in July 1970, for fuller examination of the economic, administrative, financial and actuarial implications. The Committee reported that in the conditions obtaining in the country, it was not advisable to introduce crop insurance in the near future on a pilot or an experimental basis.

Despite the unfavourable report of the Dharam Narian committee, political compulsions forced the government to introduce crop insurance in the country in 1972 on an experimental basis. The General Insurance Department (GID) of the Life Insurance Corporation (LIC) introduced the first ever crop insurance scheme based on individual farm based approach in 1972 for cotton in Gujarat. The crop insurance programme was subsequently transferred to the General Insurance Corporation (GIC) of India after the nationalization of Property & Casualty insurance business in mid 1972. The scheme was extended to Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu and West Bengal and covered cotton, wheat, groundnut and potato. The scheme was in operation up to 1978-79 and covered only 3,110 farmers. The total premium collected was Rs. 4.54 lakh against the claim of Rs. 37.88 lakhs. The claim premium ratio was 8.34 indicating that for every one rupee of premium collected, the scheme paid Rs. 8.34 in claims. Among other things, the scheme

selected progressive farmers having assured irrigation facilities and ensured timely supply of crucial agricultural inputs such as HYV seeds, fertilizers, pesticides and other inputs. However, the GIC of India found these schemes uneconomic and unsuitable for implementation on a large scale due to very high claim premium ratio (Agarwal 1980; Tripathi 1987).

Commenting on the recommendations of the Expert Committee, Dandekar wrote, "... crop insurance in the country has been given an expert burial. Moreover, this has been so expertly done that no room is left for an introduction of crop insurance in the near future even on a pilot or an experimental basis" (Dandekar 1976). He suggested an alternative approach linking crop insurance with institutional credit,8 i.e., crop loan. The main objectives of the scheme were: (I) to provide a measure of financial support to the farmers in the event of crop failure as a result of drought, floods, etc., and (ii) to restore credit eligibility of the farmers after a crop failure for the next crop season.

Having gained experience from the experimental programme carried out earlier, Government of India initiated a Pilot Crop Insurance Programme in 1979. The scheme was based on the method suggested by Prof. Dandekar. There was a shift from individual farm-based insurance to area yield based' insurance. The scheme was first introduced in three states viz., Gujarat, Tamil Nadu and West Bengal in kharif 1979 on pilot basis. Later on, it was extended to nine more states.

4.3. Salient Features of the Scheme

1. The basic unit of insurance was 'homogeneous area' rather than an individual. Taluka / revenue circle was considered as area unit. The premium as well as the indemnity rate for the notified crop was uniform for all the insured farmers irrespective of their actual yield. Indemnities were paid to all insured farmers when the average output of the given area fell below the 'normal' output of the area.

2. The insurance policies were issued in favour of the institutional credit agencies, i.e., District Central Cooperative Bank or the Commercial Bank as the case might be.

3. Only a few major cereals, pulses and oil seeds crops were covered under the scheme with a provision for inclusion of non-food crops with adequate crop cutting data.

4. The scheme was voluntary in nature. The GIC of India formulated separate schemes for kharif and rabi seasons and implemented in select area in consultation with the state government.

5. The crop insurance scheme was multi-peril insurance in nature as it covered almost all the natural risks except war and nuclear risks.

6. The premiums were to be set in such a way that the premium collected for the area over the long-run matched the indemnity payments over the same time horizon (i.e., it is actuarially fair).

7. The premium and indemnity rates for individual crop were calculated for the homogeneous area (taluka or revenue circle) based on the crop cutting data for 10 preceding years.

8. The threshold yield for various crops ranged between 50 to 80 per cent of the normal yield of the area during the specific season. The yield above the threshold was not indemnifiable or in other words, the farmers had to bear the loss between normal and threshold yield.

9. The premium and indemnity tables were prepared based on threshold yields. The premium rates were fixed ranging from 5 per cent to 20 per cent of the sum insured.

10. The indemnity became payable only when assessed yield in the insured area was less than the guaranteed (threshold) yield. The maximum indemnifiable limit was the difference between threshold yield and the actual yield during the season.

11. The overall liability for crop insurance policies was limited to Rs. 12 crores per annum for the whole country. This was shared by the GIC of India and the State Government concerned in the ratio of 3:1

The details about the coverage, in terms of number of farmers, area covered, premium collected and total claims paid for the Pilot Crop Insurance Scheme implemented during 1979 through 1984-85 have been provided in Table 4.1 (Fig.1). The total amount of premium collected during the six years of pilot implementation of crop insurance was Rs. 195 lakhs and total claims or indemnity payments were around Rs.155.7 lakhs.

Table 4.1 : Working Results of Pilot Crop Insurance Scheme during 1979 - 85

Particulars	YEARS						Total
	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	
No. of states	3	3	8	9	11	12	—
Area covered (ha)	13181	18703	24467	70729	87347	477333	691760
Farmers covered	16265	23442	24625	50855	60349	447086	622622
Sum insured*	130.30	165.77	202.82	468.26	653.64	4446.49	6067.28
Premium collected	5.53	6.93	7.55	15.65	21.15	138.20	195.01
Total claim paid	5.29	3.27	9.64	37.32	8.37	91.80	155.68
Claim ratio (%)	95.71	47.10	127.67	238.46	39.56	66.42	79.83

* Sum insured, Premium collected and claims paid are in lakh rupees
Source : Tripathi 1987.

The overall claim to premium ratio was roughly 80 per cent indicating that about 80 per cent of the total premium collections were used for the payment of claims or indemnities. The average premium collected for crop insurance declined from Rs. 41.95 per hectare in 1979-80 to Rs 22.13 per hectare during 1982-83 and increased thereafter to Rs. 28.95 per hectare in 1984-85. Incidentally, the average premium collected per hectare was the lowest and the average indemnity paid per insured crop hectare was the highest (Rs. 52.76 per insured hectare) during 1982-83.

4.4. Shortcomings of the Pilot Crop Insurance Scheme

Following were some of the factors that impinged upon the coverage of the crop insurance scheme.

- A Majority of the holdings were in small and marginal farm categories and these farms have poor access to institutional credit. Since Crop insurance was linked to crop loans, many small and marginal farmers could not participate in the crop insurance scheme.

- The threshold yield was fixed on the basis of the average of the preceeding 10 years whereas the trend in the growth of yield levels for most of the crops was positive.

- The threshold yield or level of non-indemnifiable yield was very high even for low risk areas.

- Exclusion of the high risk areas from crop insurance scheme

- The unit of insurance or area defined as homogeneous area was very large

- Unawareness among the farmers about the crop insurance scheme

- Major commercial crops like cotton and sugarcane were excluded from the crop insurance scheme.

4.5. Approaches to Crop Insurance

There are basically two major approaches followed in crop insurance.

 (i) Area approach, and

 (ii) Individual approach

4.5.1. Area approach

A geographical area consisting of a district, taluka, block, village or group of villages having homogeneous agro-climatic conditions is considered as a unit area for crop insurance purpose. The indemnities are paid when the average yield in the defined area falls below a selected trigger level (threshold) level. The farmers have the option to select a desired trigger among the given options. The premium is determined depending on the trigger level. Indemnification is determined by multiplying the percentage shortfall below the trigger yield times the value of protection selected.

The individual farmers generally have little impact on average area yield. This eliminates/minimizes the problem of moral hazards and adverse selection, which are unique to the insurance sector. Moreover, administrative costs of implementing the crop insurance programme are reduced. In addition, better data are generally available on the distribution of area yield than on individual farm yields which allow insurers to more accurately price the insurance. The main advantage of this system is seen as being the improved coverage of systematic yield risk, whilst other problems associated with individual farm yield insurance programme, such as adverse selection and moral hazard, are also greatly reduced.

Area approach has some drawbacks particularly when the defined unit area is relatively large. A farmer receives no indemnity payment

even if he experiences a significant shortfall in the yield If the average yield of the notified crop in the defined area is above the trigger/threshold yield. On the contrary, a farmer may realize an above yield and still receive an indemnity payment if the average yield of the insured crop in the defined area falls below the selected trigger level.

4.5.2. Individual approach

Unlike the area approach, premium, coverage of risk in production and indemnity payments are based on the farm level data of a particular farm household. A detailed inspection of the individual farm is required as indemnities are based on the year to year fluctuation in the output on the individual plot. Since insurance is offered to the individual, the details of productivity or yield data for individual plots for the insured crop for a longer time horizon are needed.

Individual approach faces a serious problem of adverse selection. This problem arises because of asymmetric information. The producers/farmers are better informed about the distribution of yields on their farms whereas the insurer lacks access to reliable individual yield data and other information (Skees and Reed 1986). Thus, the farmers who recognize that their expected indemnities exceed their premium are more likely to purchase insurance coverage leading to adverse selection. The adverse selection is usually manifest in premiums those are aggregated in some fashion about average risk levels such that high-risk individuals are under charged and low risk individuals are over charged. In other words, high risk individuals are offered a full coverage fair premium insurance contract, while low risk individuals pay a fair premium for less than full coverage insurance (Rothschild and Stiglitz 1976). In the process only high-risk individuals would tend to participate in the programmes and low risk individuals would opt out. Adverse selection results in higher out lay on payments of indemnities than the premium income and in the long-run insurance companies suffer loss. The insurance companies hike the premium in order to cover the losses, which again encourage participation by high-risk group of farmers resulting in adverse selection.

Economic theory suggests that adverse selection problem can be avoided if insurance contracts are based on perfect information about each insured's risk types. However, in reality, insurers generally do not have precise information about an insured's risk type (Hazell 1990).

Another problem associated with imperfect information is moral hazard. Depending upon the extent and conditions of insurance coverage, a farmer may influence the output. The farmer or producer may not take proper care of the crop, livestock or machinery if the indemnities to be received are higher than the premium paid. The individual based insurance also increases the administrative costs, as insurer has to gather data for each individual plot of the concerned farmer.

Hazell (1990) decomposes risk in agricultural production into two components: insurable risk and uninsurable risk. An insurable risk can be defined by three characteristics:

- It must be quantifiable,
- The damage it can cause must be easy to attribute to the insurer, and
- Neither the occurrence of the event nor the damage it causes should be affected by the insured behaviour, i.e., absence of moral hazard.

The crop damage due to negligence in production practice, for example, when there is a pest attack, is defined as an uninsurable risk. The uninsurability of many yield risks arises from moral hazard problems. Since many of the insured risks in agricultural insurance are uninsurable, multi-peril crop insurance is expensive and has to be heavily subsidized.

The empirical analysis by Turvey and Islam (1995), shows that, on an average, area insurance premiums are much lower than the individual yield insurance premiums, and in terms of efficiency in risk-reduction, individual plans are superior to area plans. Arguments of asymmetric information, which have led some researchers to investigate area versus individual yield insurance, are not totally resolved. Inequities in the benefits of area plans across farmers are not equitably distributed, favouring high-risk producers. Adverse selection causes instability in the pooled contracts which will ultimately cause area insurance plans to fail.

The evaluation of three crop insurance programmes in terms of their effectiveness of yield risk reductions was carried out for farmers in Manitoba, Canada. The results suggested that, given an actuarially sound basis, the fully individualized crop insurance programme is the most favourable choice for risk-averse producers. The area coverage and individual indemnity programme is generally the second best option. Risk-averse farmers least prefer the full area crop insurance programme (Ye and Yeh 1995).

CHAPTER 5 :
COMPREHENSIVE CROP INSURANCE SCHEME

5.1. Comprehensive Crop Insurance Scheme (CCIS)

After successful implementation of the pilot scheme on Crop Insurance, the Government of India with active participation from the State governments introduced the **Comprehensive Crop Insurance Scheme** with effect from 1 April 1985, coinciding with the initiation of the 7th Five Year Plan. The scheme operated on homogeneous **'area yield'** based approach. The scheme was compulsory for all the borrowers of the short-term crop (production) loans from institutional sources.

The State Government and the Union Government jointly funded the Crop Insurance scheme and shared both premium and claims in the ratio of 1:2. The General Insurance Corporation (GIC) of India established Crop Insurance Cells in their offices at the state level and maintained close liaison with the state government, RBI, NABARD and other financial institutions like co-operatives, commercial banks, Regional Rural Banks (RRBs.) etc. the GIC of India administered the CCIS in the states with the active participation of the concerned state government. The functioning of the CCIS has been shown as a flow chart in fig. 1.

The scheme was being implemented by using resources from "State Crop Insurance Fund" generated by the State Government and contribution from Government of India from time to time. However, the Government of India stopped their contribution to the "State Fund" from 1987-88 onwards but is remitting their 2/3rd share towards claims and subsidy on premium directly to the General Insurance Corporation.

All the farmers availing crop loans from co-operative credit institutions, commercial banks and regional rural banks for rice, wheat, sorghum, millets, pulses and oilseeds during kharif, rabi and summer were eligible for the insurance cover. The insurance coverage was built in as a part of crop loan in the areas where the scheme was in operation. The premium charged was 2 per cent of the crop loan borrowed for cereals (rice, wheat and millets) and 1 per cent of the sum insured for oilseeds and pulses. The premium amount used to be reimbursed by the financing agency to GIC of India directly on behalf of the borrower. The premium amount was additional credit over and above the scale of finance available for a particular crop. The details about the operation of CCIS have been presented below.

Fig. 1

Flow Chart of CCIS

```
 ┌─────────────┐              ┌─────────────────────────────────┐
 │   Loanee    │─────────────▶│ Avails crop loan for notified   │
 │   farmer    │              │ crop (compulsory Insurance      │
 └─────────────┘              │ cover)                          │
                              └─────────────────────────────────┘
                                             │
                                             ▼
                              ┌─────────────────────────────────┐
                              │     Seeks extended coverage     │
                              └─────────────────────────────────┘
                                             │
                                             ▼
 ┌─────────────────────┐      ┌─────────────────────────────────┐
 │ Bank Branch/ PAC's  │◀─────│  Fill up proposal for additional│
 └─────────────────────┘      │             coverage            │
           │                  └─────────────────────────────────┘
           ▼
 ┌─────────────────────┐      ┌─────────────────────────────────┐
 │ Consolidate Loanee  │─────▶│          Nodal Bank             │
 │ details within cut  │      └─────────────────────────────────┘
 │ off date            │           ▲                 │
 └─────────────────────┘           │                 ▼
                          ┌─────────────────┐  ┌──────────────────┐
                          │ Incomplete/     │  │ Consolidate into │
                          │ incorrect       │  │ Loanee           │
                          │ declarations for│  └──────────────────┘
                          └─────────────────┘           │
                                   ▲                     ▼
                          ┌─────────────────────────────────────┐
                          │          G. I. C. Crop Cell          │
                          └─────────────────────────────────────┘
                                   ▲                     ▲
  ┌──────────────────────────┐     │                     │
  │ • Notification           │     │                     │
  │ • Submission of Yield    │─────┘                     │
  │   data                   │                           │
  │ • Funds                  │                           │
  │ • Share claims           │                           │
  └──────────────────────────┘                           │
                          ┌─────────────────────┐         │
                          │  State Government    │         │
                          └─────────────────────┘         │
                                   ▲                       │
                          ┌─────────────────────────────────────┐
                          │ Directorate of Economics and         │
                          │ Statistics                           │
                          │ Conducts crop cutting experiments –  │
                          │ used for both notification and claim │
                          │ settlement                           │
                          └─────────────────────────────────────┘
```

5.1.1. Major objectives of CCIS

The major objectives of the CCIS are more or less the same as that of the Pilot Crop Insurance Scheme as given below.

1. To provide a measure of financial support to farmers in the event of crop failure due to vagaries of nature such as drought and floods,

2. To restore credit eligibility of farmers after a crop failure for the next crop season and

3. To support and stimulate production of cereals, pulses and oilseeds

5.1.2. Area approach/defined area

There is a three-tier system in the notification of crops eligible for insurance. At the apex or national level Ministry of Agriculture, the Government of India declares the crops that are eligible for insurance under the CCIS. At the second stage, the State department of agriculture issues a notification on the type of crops that are eligible for insurance cover within the state (sub-set of the crops notified by the central government). Finally, the department of agriculture in the state notifies the crops in the respective homogenous areas (Taluk) that can be insured during the concerned crop season. Generally, taluka is considered as the homogenous area and unit for calculating premium and level of indemnity payments under CCIS. A crop is notified or becomes eligible for insurance if it covers a minimum area of 1,000 hectares in the taluk. In addition to this, the availability of past data and the ability to conduct requisite number of crop cutting experiments are the important parameters in notifying the crop. Most of the cereals, important pulses and oilseeds are included in the list of notified crops under CCIS in most of the states.

5.1.3. Assessed Yield

The actual average yield per hectare of the insured crop for the defined area was estimated through crop cutting experiments conducted during the insured season. Minimum 16 crop cutting experiments were to be conducted for selected crops, in each notified taluka.

5.1.4. Threshold yield

Threshold yield represents 60 to 90 per cent of the average yield per hectare for the last five years of a crop in a 'defined area' (or such shorter period as decided for specific defined area). Data from crop cutting experiments or any other such alternative methodology adopted by the Government of India is used for calculating the threshold yield. Generally, 5 years average yield of millets, pulses and oilseeds in the defined area are used as threshold yields as against 3 years average yield of wheat and paddy.

5.1.5. Level of indemnity

The level of indemnity in the existing Comprehensive Crop Insurance Scheme is notified for each crop separately based on variability (coefficient of variation) in the yield of that crop in the past. The crops are classified as low-risk, medium-risk and high-risk crops depending on the variability in yield levels as shown in Table 5.1 below.

Table 5.1 : Risk Levels and Indemnity Payments

Sl. No.	Type of Risk	Coefficient of Variation (%)	Level of Indemnity (%)
1	Low	Up to 15	90
2	Medium	16 to 30	80
3	High	Above 30	60

The categorization of crops in different classes of risk is based on the yield data of the 10 preceding years. The level of indemnity payment may vary from year to year depending upon the coefficient of variation.

5.1.6. Payment of indemnity

If actual yield falls short of specified threshold yield, all farmers growing that crop in the defined area are deemed to have suffered shortfall in their respective yields and are eligible for compensation or payment of indemnity. The amount of indemnity or the compensation payable is calculated as under:

Threshold yield - Actual average yield

————————————————————— X Sum insured for the farmer

Threshold yield

5.1.7. Sum insured

The sum insured per borrower farmer was 150 per cent of the crop loan, subject to a maximum of Rs. 10,000 for growing notified crop/crops in the defined area during the insured season. However, from kharif 1988, the sum insured has been reduced from 150 per cent to 100 per cent of the crop loan disbursed to a farmer with a ceiling of Rs. 10,000.

5.1.8. Subsidy on insurance charges

Small and marginal farmer borrowers (land holding less than 2 hectares) are granted 50 per cent subsidy for the payment of insurance premium. The Central and State Governments share the subsidy equally. In case of Union Territories, the entire subsidy is borne by the Government of India.

5.2. Spread and Penetration of CCIS

The number of farmers covered increased from little less than 4 million in 1985-86 to 6.76 million in 1987. The area coverage increased from 7.69 million hectares to 11.65 million hectares during the same period. However, in the following three years, the number of farmers as well as area covered declined. The number of farmers and area covered under crop insurance stabilized in the nineties (Table 5.2). The number of farmers hovered between 5 to 6 million whereas the area ranged between 8 and 10 million hectares (fig. 5.1). The total premium collected from 1985 through 1999 amounted to Rs. 4,035.59 million and the total claims were to the tune of Rs. 23,038.54 million. The total claims settled from 1985 kharif through 1998 rabi season summed up to Rs. 22,270.11 million (fig. 5.2).

The claim premium ratio ranged from 1.95 in 1994-95 to 11.13 during 1991-92. The claim premium ratio exceeded 10 during 1987-88, 1991-92 and 1999-2000. This indicates that GIC paid more than Rs. 10 for each rupee of premium collected during these years. The average claim/premium ratio worked out to 5.71 indicating that farmers received on an average Rs. 5.71 as indemnity payments for every rupee they paid as premium.

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Table 5.2 : Results of CCIS for All India from 1986 Through 1999

(Figures in Millions)

Year	Far-mers	Area	Sum Insured	Premium collected	Total Claims	Claim/ Premium ratio	Claims paid
1985	3.85	7.69	7,811	138.97	872.63	6.28	872.63
1986	5.08	9.84	10,986	195.05	1,739.58	8.92	1,739.58
1987	6.76	11.65	16,161	279.47	2,894.73	10.36	2,894.73
1988	3.85	6.25	7,148	120.00	330.57	2.75	330.57
1989	4.89	7.60	10,255	172.50	372.86	2.16	372.86
1990	2.74	4.48	7,114	111.62	855.97	7.67	855.97
1991	4.56	7.98	11,383	180.88	2,013.04	11.13	2,013.04
1992	5.02	8.43	14,206	229.17	509.55	2.22	509.55
1993	5.05	8.08	15,872	255.48	1,886.11	7.38	1,885.30
1994	5.19	8.24	18,769	297.09	580.23	1.95	579.34
1995	5.66	9.07	21,638	343.30	1,489.65	4.34	1,486.74
1996	5.85	9.46	24,666	393.52	1,722.14	4.38	1,717.31
1997	6.00	9.69	26,298	414.76	1,870.24	4.51	1,713.04
1998	6.20	10.13	29,110	463.53	1,284.39	2.77	685.57
1999	5.58	8.97	28,331	440.25	4,616.87	10.49	4,613.89
Total	76.27	127.57	249,749	4,035.59	23,038.54	5.71	22,270.11

Fig. 5.1

Number of Farmers and Areas Covered Under CCIS

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Fig. 5.2

Premium Collected and Claims paid under CCIS
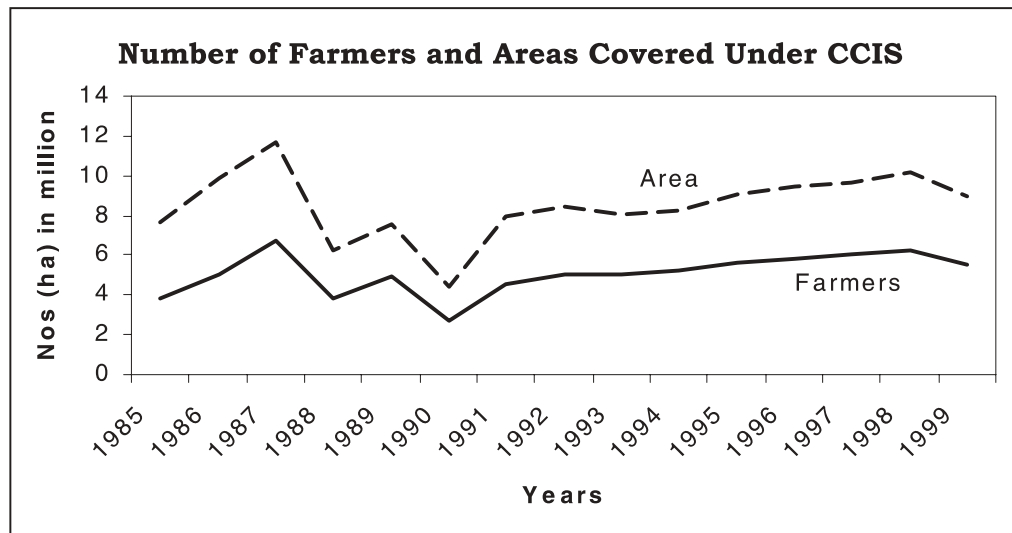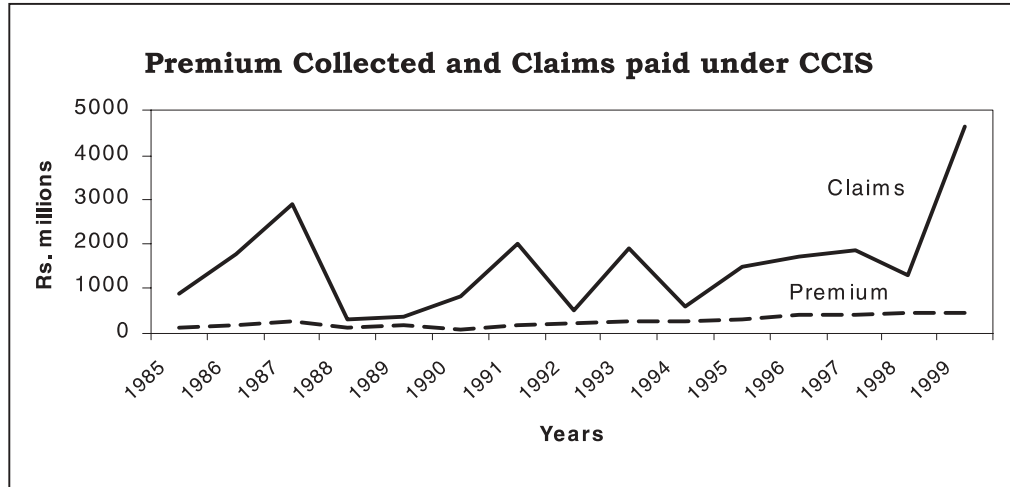
The claims paid over and above the premium collected accounted ranging from little more than one half per cent of the actual expenditure (from planned outlay) on agriculture sector during 1994-95 when compared to 9.53 per cent during 1987-88 (Table 5.3). The cumulative average of claims paid net of premium accounted for 2.88 per cent of the actual expenditure in the agriculture sector. The amount reimbursed to insured farmers as indemnity payments from inception of CCIS till rabi 1999-2000 accounted for less than 10 (9.22) per cent of the actual sum insured by the participating farmers. However, Indian crop insurance programme is not an exception and crop insurance programmes in Brazil, Mexico, Philippines, Japan and USA also indicate very high claim premium ratios (Hazell 1992).

Average area insured per household was 2.00 ha during 1985. However, it declined slightly in the following years. The average area insured per hovered around 1.6 ha per borrower in the 1990s (Table 5.4). Average sum insured per household over the years was Rs. 3,275 and it ranged between Rs. 1,855 in 1988 and Rs. 5,077 in 1999. Similarly, the average sum insured per hectare increased from Rs. 1,016 in 1985 to Rs. 2,875 in 1998. The average premium paid per hectare more than doubled (Rs. 78.90) in the late 90s when compared to Rs. 36 in 1985.

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Table 5.3 : Claims as Percentage of Actual Expenditure (from plan outlay) in Agriculture Sector During Various Years

(Rs. in Crores)

Years	Sum Insured	Claims Paid Over & Above the Premium	Actual Expenditure from Plan Outlay	Claims as % of Expenditure in Agriculture	Claims as % to Sum Insured
1985	781.1	73.4	1,825.9	4.02	11.17
1986	1,098.6	154.5	2,215.8	6.97	15.83
1987	1,616.1	261.5	2,742.9	9.53	17.91
1988	714.8	21.1	2,903.0	0.73	4.62
1989	1,025.5	20.0	3,105.0	0.65	3.64
1990	711.4	74.4	3,405.4	2.19	12.03
1991	1,138.3	183.2	3,850.5	4.76	17.68
1992	1,420.6	28.0	4,215.6	0.67	3.59
1993	1,587.2	163.1	4,263.5	3.82	11.88
1994	1,876.9	28.3	5,350.2	0.53	3.09
1995	2,163.8	114.6	5,082.0	2.26	6.88
1996	2,466.6	132.9	5,984.4	2.22	6.98
1997	2,629.8	145.5	5,929.3	2.45	7.11
1998	2911	82.1	7,691.0	1.07	4.41
1999	2,833.1	417.7	7,365.4	5.67	16.30
Total	24,974.9	1900.3	65,929.9	2.88	9.22

Table 5.4 : Summary Statistics about Premium and Claims

Year	Avg. Area Insured/ hh*	Avg. Sum Insured		Avg. Premium Paid		Avg. Claim Paid	
		Per HH	Per Ha	Per HH	Per Ha	Per HH	Per Ha
1985	2.00	2,030	1,016	36.11	18.07	227	113
1986	1.94	2,161	1,116	38.36	19.82	342	177
1987	1.72	2,391	1,388	41.34	23.99	428	249
1988	1.62	1,855	1,144	31.15	19.21	86	53
1989	1.56	2,099	1,349	35.30	22.68	76	49
1990	1.64	2,600	1,588	40.79	24.92	313	191
1991	1.75	2,496	1,426	39.66	22.66	441	252
1992	1.68	2,831	1,686	45.66	27.20	102	60
1993	1.60	3,145	1,965	50.62	31.63	374	234
1994	1.59	3,618	2,276	57.27	36.03	112	70
1995	1.60	3,825	2,385	60.68	37.83	263	164
1996	1.62	4,219	2,606	67.30	41.58	295	182
1997	1.62	4,382	2,713	69.11	42.79	312	193
1998	1.63	4,697	2,875	74.79	45.78	207	127
1999	1.61	5,077	3,158	78.90	49.07	827	516
All	1.67	3,275	1,958	52.91	31.63	302	181

* HH : Households/farmer

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Similarly, the average premium paid per ha increased from Rs. 18 in 1985 to Rs, 49 during 1999 (Fig. 5.3). The hike in the average amount of premium was due to an increase in the scale of finance for major crops by financial institutions. Amount of claims as indemnities varied from Rs. 76 per household (Rs. 49/ha) in 1989 to Rs. 827 per household (Rs. 516/ha) in 1999 (Figures 5.4 and 5.5). On an average, the total claims paid accounted for less than 10 per cent (9.22) of the sum insured during 1985 through 1999 and it varied between 3 per cent and 17.9 per cent of the sum insured during 1994 and 1987 crop years respectively. The claims paid were less than 5 per cent of the sum insured during the 5 years whereas it exceeded 15 per cent during the 3 years (Table 5.5).

Table 5.5 : Claims as the Percentage of Sum Insured

Sl. No.	Clams as % of Sum Insured	Frequency (Number of Years)
1.	Less than 5	5
2.	5 to 10	4
3.	10 to 15	3
4.	More than 15	3

Fig. 5.3

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Fig. 5.4.

Average Premium Paid and Indemnity Received Per Farmers

Fig. 5.5

Average Premium Paid and Claim Received Per Ha
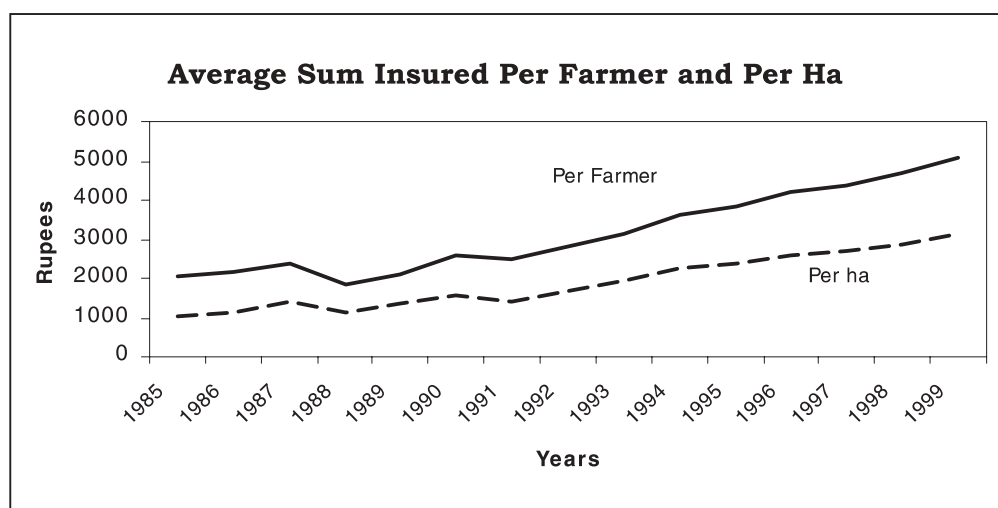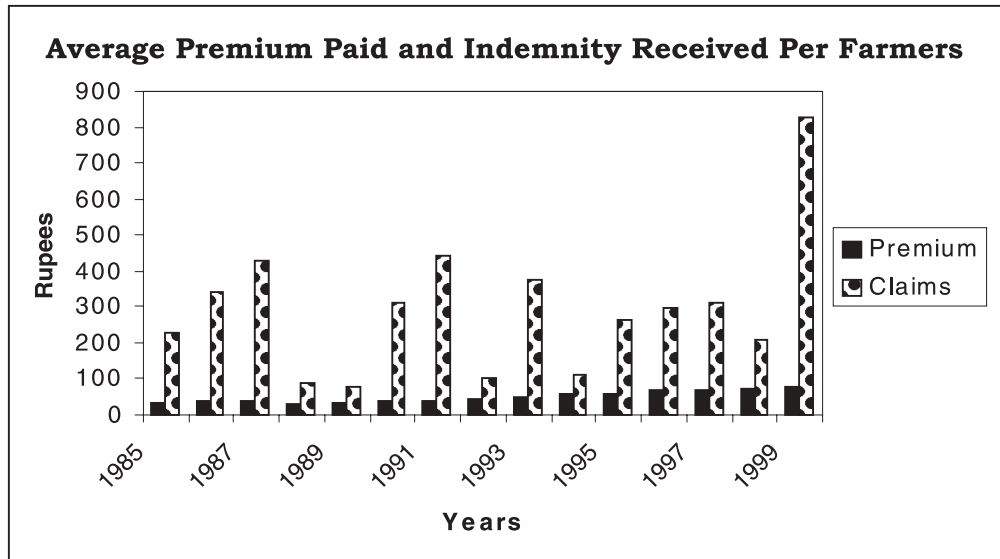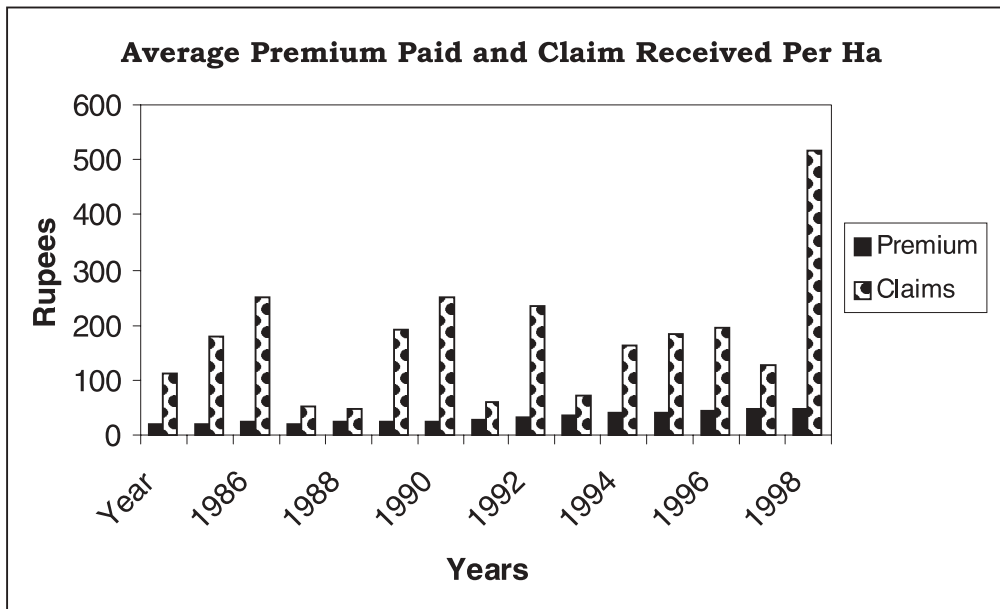
5.3. Coverage of CCIS Across the States

5.3.1. Number of farmers, area covered, premium and claims

As stated elsewhere, CCIS was introduced in 1985 by the Government of India in consultation with the state governments on

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cost sharing basis. However, participation of states in the scheme was not uniform. Some of the agriculturally progressive states like Punjab and Haryana did not participate in the CCIS at all (Table 5.6). Some of the states participated in CCIS only for a year whereas others participated for varying length of time. For example, states like Andhra Pradesh, Bihar, Goa, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Tripura and West Bengal participated in CCIS throughout for 15 years (1985 through 1999) whereas, states like Jammu and Kashmir, Manipur, Rajasthan and Uttar Pradesh participated in the CCIS for a period ranging from 1 to 4 years. It is surprising that states like Rajasthan, Uttar Pradesh and Tamil Nadu, having sizable area under coarse cereals and pulses, had very modest coverage under CCIS.

As stated elsewhere, participation in CCIS was not compulsory and the State government had every freedom to opt for CCIS or otherwise. Since it was optional, many states did not participate in the CCIS whereas a few opted for some seasons or years. The agriculturally developed states like Punjab and Haryana did not join the CCIS and extend different reasons for not joining the scheme. For example, Punjab was not interested in multi-peril crop insurance and wanted insurance cover against hailstorm only with higher indemnity limits. Similarly, Haryana desired smaller area units, i.e., village or cluster of villages for estimating yield levels and indemnity payments. Arunachal Pradesh was interested in covering horticultural crops under CCIS (GOI 1990 as quoted in Mishra 1996). Rajasthan participated in the scheme during the 1985-86 rabi in 1986 kharif seasons but opted out of the scheme in the following year as the state government found it difficult to pay its share of indemnity.

Four states namely, Andhra Pradesh, Gujarat, Madhya Pradesh, and Maharashtra together accounted for more than two third (68 per cent) of the total number of farmers availing crop insurance facility. The area covered under crop insurance in these four states accounted for nearly 76 per cent of the total cumulative area during the study period (Fig 5.6).

Table 5.6 : Number of Farmers and Area Covered, Premium Collected and Claims Paid under CCIS by States

States	No. of Years	Percentage to total					Claim/ Premium Ratio
		No. of Farmers	Area Covered	Sum Insured	Premium Collected	Claims Paid	
Andhra Pradesh	15	18.01	19.68	26.55	28.08	20.91	4.25
Assam	14	0.29	0.07	0.09	0.10	0.02	1.40
Bihar	15	4.14	2.74	3.75	4.64	2.07	2.54
Goa	15	0.12	0.02	0.01	0.01	0.00	1.32
Gujarat	15	13.74	18.19	21.67	16.39	47.31	16.47
Himachal Pradesh	14	0.04	0.02	0.02	0.02	0.02	4.38
Jammu & Kashmir	2	0.07	0.06	0.03	0.04	0.03	4.13
Karanataka	14	3.99	4.15	5.33	5.04	2.91	3.29
Kerala	15	0.68	0.45	0.82	1.02	0.42	2.34
Manipur	1	0.01	0.00	0.01	0.01	0.00	0.00
Madhya Pradesh	15	15.08	22.20	10.01	9.16	4.33	2.70
Maharashtra	15	21.62	16.21	12.81	12.87	9.36	4.15
Meghalaya	13	0.03	0.02	0.01	0.02	0.00	1.42
Orissa	15	5.83	4.52	5.86	7.07	7.69	6.21
Rajasthan	2	0.71	1.21	0.33	0.40	1.00	14.35
Tamil Nadu	15	3.32	3.12	4.85	5.47	2.17	2.27
Tripura	15	0.05	0.02	0.03	0.03	0.00	0.50
Uttar Pradesh	4	3.62	4.19	1.73	2.11	0.22	0.59
West Bengal	15	8.61	3.08	6.01	7.44	1.52	1.17
A & N Island	7	0.00	0.01	0.01	0.01	0.00	1.62
Delhi	3	0.00	0.00	0.00	0.00	0.00	0.00
Pondichery	14	0.03	0.04	0.07	0.08	0.03	1.99
All (Total in millions Rs)	15 —	100 (76.27)*	100 (127.57)	100 (249748)	100 (4035.59)	100 (23038)	5.71 —

Note: Figures in parentheses are number of total farmers in millions and area in million ha

The sum insured was 71 per cent of the total sum insured under CCIS in the country. The total amount of premium collected from these states was Rs. 2,683.6 million (66.5 per cent of the total in the country) and the claims paid amounted to Rs. 18,870 million accounting for little less than 82 per cent of the claims paid by CCIS during 1985 through 1999 (Fig.5.7) The average claim premium ratio for the four states taken together was 7.03 as against 5.71 for the country as a whole.

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Fig. 5.6

Percentage Share of 4 Major States in Total Farmers, Area and Sum Insured

Fig. 5.7

Premium and Claims Shared by 4 Major States
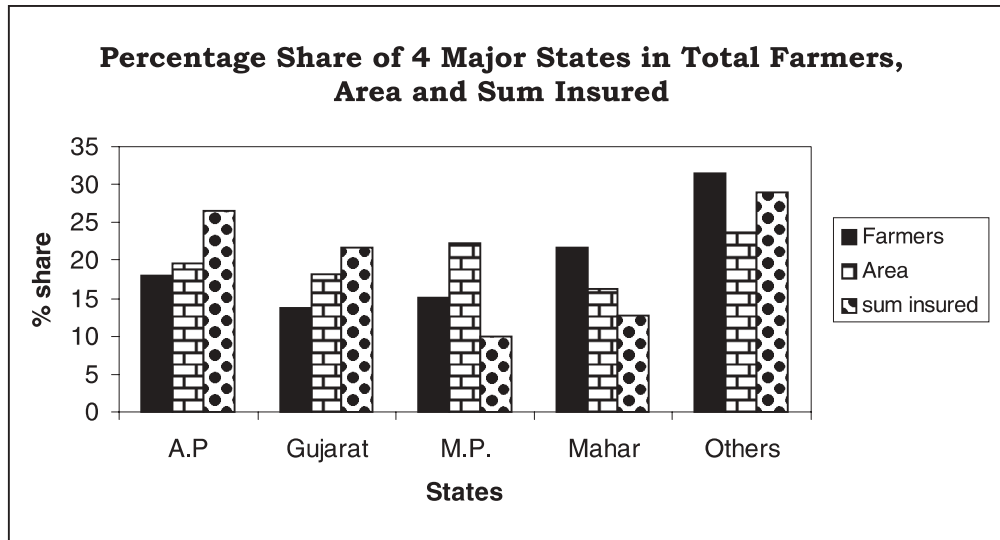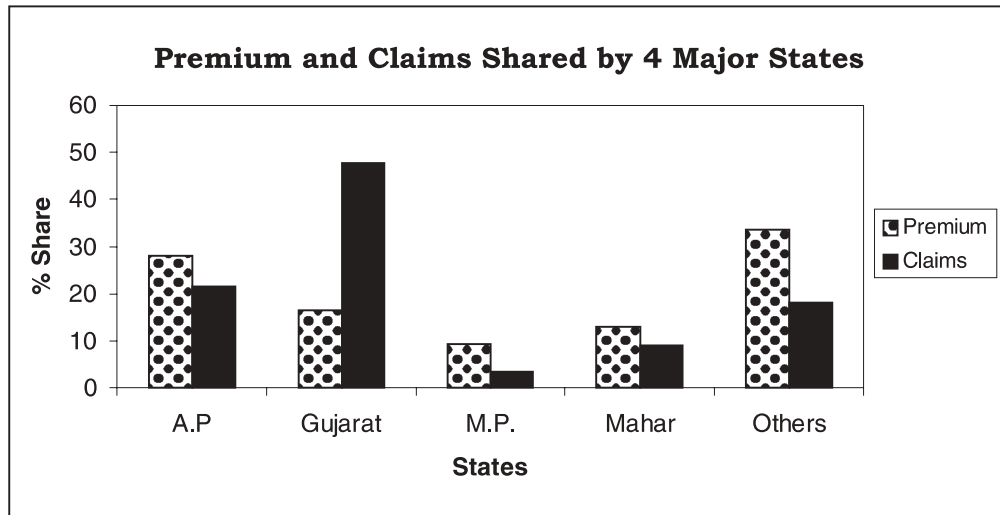
The premium collected and the indemnities paid varied across the states and over the years. In most of the states the indemnities paid exceeded the premium collected resulting in claim premium ratio of more than unity (Table 5.7). States and UTs like Goa, Tamil Nadu, Tripura, West Bangal, Andaman & Nicobar and Pondichery had claim premium ratio less than one for 8 or more years. On the contrary, claim premium ratio was more than 5 in the states like Andhra Pradesh, Gujarat, Himachal Pradesh, Maharashtra and Orissa for one third of the years during 1985 through 1999. In

Andhra Pradesh and Karnataka, indemnities paid exceeded the premium for most of the years except one year. The details about loss ratios by the states have been presented in Annex Table 3. It is interesting to note that the claim premium ratio was less than unity in Manipur, Delhi, Tripura and Uttar Pradesh.

Table 5.7 : Claim Premium Ratio by States (1985 through 1999)

Number of Years

States	Claim/Premium Ratio			
	<1	1 to 2	2 to 5	>5
Andhra Pradesh	1	4	4	6
Assam	6	4	3	1
Bihar	6	3	4	2
Goa	12	—	2	1
Gujarat	5	—	2	8
Himachal Pradesh	7	1	1	5
Jammu & Kashmir	1	—	1	—
Karnataka	1	5	4	4
Kerala	6	6	1	2
Manipur	1	—	—	—
Madhya Pradesh	5	3	5	2
Maharashtra	4	3	3	5
Meghalaya	7	1	5	—
Orissa	5	2	2	6
Rajasthan	1	—	—	1
Tamil Nadu	8	4	1	2
Tripura	14	—	1	—
Uttara Pradesh	2	1	1	—
West Bengal	8	4	3	—
Andaman & Nicobar	8	2	2	1
Delhi	3	—	—	—
Pondicherry	10	1	2	1
Total	—	1	7	7

The claim premium ratio was more than 5 in three states, namely, Orissa (6.2), Rajastahan (14.3) and Gujarat (16.5). This indicates that in Gujarat and Rajasthan, GIC had to pay more than Rs. 14 as indemnity payment for one rupee of premium collected. In

the case of Gujarat, premium collected accounted for less than 17 per cent of the total premium in the country whereas, the claims paid accounted for roughly 48 per cent of the total claims during 1985 through 1998. Saurashtra experienced severe drought during 1985, 1986, and 1987. Crop failures (especially groundnut) were reported during 1990, 1991 and 1993. This resulted in very high indemnity payments. The claim premium ratio in Gujarat exceeded 25 for 6 years between 1985 and 1998. Groundnut is a major cash crop and is grown on a large area in Saurashtra region of Gujarat during kharif season. There were reports indicating that the farmers used to pressurize village level officials conducting crop cutting experiments to underestimate the crop yields so that farmers in the area could get the indemnity payments (Mishra 1996).

The average claim premium (loss) ratios at the all India level beginning with 1985 till 1999 was 5.71. The aggregate loss ratio at the all India level varied from a minimum of 1.95 in 1994-95 to a maximum of 11.13 for the crop year 1991-92. The low levels of premium rates, on the one hand, and very high indemnity payments, on the other, resulted in very high loss (claim/premium) ratios. The premium collected was not based on principles of actuary. The premium levied or collected for a crop was invariably uniform throughout the country whereas significant differences were observed in the year to year productivity across the regions.

5.3.2. Seasonal variation in the coverage of CCIS by years

A major part of the crop loans are disbursed in the beginning of the crop season, i.e., during kharif and this is reflected in the proportion of households and area covered under CCIS. It is observed that more than 80 per cent of the total farmers and area covered under CCIS were insured during Kharif season ((Table 5.8). The area as well as number of farmers covered under CCIS increased during the initial two years but declined during 1988-89. The large number claims and huge indemnities paid during the first three years required more funds than were budgeted, The operation of the scheme was suspended for some time and there was delay in taking the decision about continuance of CCIS. The states like Uttar Pradesh, Jammu and Kashmir and Karnataka could not participate in the scheme during both kharif as well as rabi season due to delay in the decision process whereas Gujarat, Madhya Pradesh and Orissa did not implement the scheme in the 1988-89 rabi season (Mishra 1996).

The number of farmers opting for crop insurance during kharif season hovered around 4 million and area covered around 7 million

ha between 1991 and 1994-95 and the number of farmers stabilized around 5 million and area covered was roughly 8 million ha after mid 1990s. The number of farmers and area covered under CCIS during the rabi season were the highest, i.e., 2.13 million farmers and 3.24 million ha of area during 1987-88.

Table 5.8 : Number of Farmers and Area Covered under CCIS During Kharif and Rabi Seasons from 1985 through 1999

(Figures in millions)

Year	No. of Farms	Area Covered (in Ha.)	Sum Insured	Premium Collected
Kharif season				
1985	2.64	5.37	5427.30	94.18
1986	3.96	7.74	8561.99	149.88
1987	4.63	8.41	11406.76	191.00
1988	2.98	5.24	5506.99	88.75
1989	4.23	6.65	8738.95	144.85
1990	1.94	3.41	5151.51	76.58
1991	3.76	6.86	9314.07	144.32
1992	4.23	7.37	11794.72	186.09
1993	4.23	6.95	13093.82	206.54
1994	4.34	7.14	15657.84	242.78
1995	4.78	7.80	17841.58	274.01
1996	4.85	8.06	19734.41	304.22
1997	5.13	8.35	22295.71	343.00
1998	5.29	8.21	24441.52	382.86
1999	5.58	8.97	28330.55	440.25
Total	**62.57**	**106.53**	**207,297.72**	**3,269.30**
Rabi season				
1985	1.21	2.32	2,384.10	44.78
1986	1.13	2.10	2,423.74	45.17
1987	2.13	3.24	4,754.39	88.47
1988	0.87	1.01	1,640.88	31.25
1989	0.66	0.96	1,515.61	27.66
1990	0.79	1.07	1,962.77	35.05
1991	0.80	1.12	2,068.54	36.55
1992	0.79	1.06	2,411.58	43.08
1993	0.82	1.12	2,778.41	48.94
1994	0.85	1.10	3,110.84	54.31
1995	0.88	1.28	3,796.78	69.29
1996	1.00	1.40	4,931.88	89.30
1997	0.87	1.35	4,002.62	71.76
1998	0.91	1.92	4,668.62	80.68
1999	0.00	0.00	0.00	0.00
Total	**13.70**	**21.04**	**42,450.77**	**766.29**
All	**76.27**	**127.57**	**249,748.49**	**4,035.59**

However, the coverage of CCIS was around 1 million farmers and little more than 1 million ha area in the whole of nineties. The decline in the number of farmers as well as area covered under CCIS during 1989-90 rabi season and the 1990 kharif has been attributed to the state governments' approach to waiver of agricultural loans of the farmers (GIC 1991, as quoted in Mishra 1996) and also uncertainty about continuance of the scheme (GOI, 1990). The proportion of farmers and the area insured under CCIS during kharif and rabi seasons have been presented in Annex Tables 4 and 5.

5.3.3. Seasonal variation in the coverage of CCIS by states

At the national level, kharif season had more coverage in terms of farmers as well as area covered under CCIS. However, the number of farmers as well as area covered under CCIS during Kharif and rabi seasons varied across the states (Table 5.9). Area insured during rabi season was almost half of the total area insured in the states of Assam, Bihar, Himachal Pradesh, Jammu & Kashmir, Tamil Nadu, Uttar Pradesh, Delhi and Pondicherry.

Table 5.9 : Coverage of CCIS in Different States by Season

(In Percentages)

State	Kharif Season				Rabi Season			
	Far-mers	Area	Sum insured	Claims	Far-mers	Area	Sum insured	Claims
Andhra Pradesh	85	85	85	96	15	15	15	4
Assam	68	46	50	48	32	54	50	52
Bihar	38	42	44	63	62	58	56	37
Goa	17	88	84	98	83	12	16	2
Gujarat	93	95	97	100	7	5	3	0
Himachal Pradesh	57	51	48	41	43	49	52	59
Jammu & Kashmir	48	48	43	100	52	52	57	0
Karnataka	92	93	91	95	8	7	9	5
Kerala	50	52	51	62	50	48	49	38
Manipur	100	100	100	0	0	0	0	0
Madhya Pradesh	84	82	86	91	16	18	14	9
Maharashtra	96	96	97	98	4	4	3	2
Meghalaya	94	94	96	85	6	6	4	15
Orissa	84	87	82	95	16	13	18	5
Rajasthan	73	83	80	99	27	17	20	1
Tamil Nadu	39	44	37	24	61	56	63	76
Tripura	79	78	71	40	21	22	29	60
Uttara Pradesh	47	39	47	78	53	61	53	22
West Bengal	70	75	62	74	30	25	38	26
A & N Island	100	100	100	100	0	0	0	0
Delhi	20	20	21	0	80	80	79	0
Pondicherry	43	53	43	35	57	47	57	65
Total	82	84	83	95	18	16	17	5

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The proportion of farmers covered under CCIS during the rabi season was also high in these states/UTS. Proportionately higher area coverage during rabi season in Assam, Bihar and Uttar Pradeh could be partly explained by the cropping pattern followed in these regions. Cultivation of Bodo rice in flood plains is risky and hence, farmers might have opted for insurance cover. Similarly, in Tamil Nadu, sambha rice is grown during post monsoon season and non-availability of irrigation water through public irrigation system poses a great risk to the paddy crop. In the case of Goa, farmers covered under CCIS during rabi season accounted for 83 per cent of the total farmers but shared only 12 per cent of the total area covered under CCIS indicating that a large number of farmers with small holdings sought insurance cover for crops grown during the winter season. In the case of Manipur and Anandaman & Nicobar, the CCIS covered only Kharif crops.

5.3.4. Sum insured and claims by season and state

The average amount of sum (loan amount) insured under CCIS was modestly higher during rabi season when compared to kharif season. The same was true for the premium also (Table 5.10). However, the average amount of indemnity paid per ha was Rs. 56 during the rabi season as against Rs. 205 paid during the kharif season. The average sum insured per ha was Rs. 1946 at the all India level and it ranged from Rs. 490 in Goa to Rs. 4,030 in Manipur. Similarly, the premium paid per ha was lowest (Rs. 9.76) in Goa and highest (Rs. 80.69) in Manipur. The average amount of loan insured per ha during rabi season ranged from Rs. 627 in Rajasthan to Rs. 5,644 in West Bengal with an overall average of Rs. 2,018 at the all India level. The indemnity payments for rabi season were highest (Rs. 170 per ha) in Tamil Nadu followed by Himachal Pradesh (Rs. 136/ha) and Kerala (Rs. 134/ha). Indemnity payments were negligible in the states of Goa, Jammu & Kashmir, Rajasthan and Uttar Pradesh during the rabi season.

Table 5.10 : Sum Insured, Premium Collected and Indemnities Paid Per Ha

(In Rupees)

State	Per Ha of Insured Area - Kharif			Per Ha of Insured Area - Rabi		
	Sum insured	Premium	Claims	Sum insured	Premium	Claims
Andhra Pradesh	2,627	44.71	216	2,730	47.64	52
Assam	2,717	54.37	64	2,337	36.13	61
Bihar	2,805	56.10	204	2,585	51.68	88
Goa	490	9.76	15	713	14.42	2
Gujarat	2,362	28.83	491	1,726	22.04	34
Himachal Pradesh	1,203	23.98	91	1,370	27.36	136
Jammu & Kashmir	924	18.47	176	1,109	22.20	1
Karnataka	2,481	37.55	130	3,008	49.64	90
Kerala	3,598	71.97	203	3,647	72.95	134
Manipur	4,030	80.69	0	—	—	—
Madhya Pradesh	923	13.43	39	701	11.36	17
Maharashtra	1,569	25.33	107	1,013	19.72	42
Meghalaya	1,359	27.02	34	1,005	11.68	99
Orissa	2,391	47.70	336	3,486	61.02	118
Rajasthan	518	10.37	179	627	10.24	5
Tamil Nadu	2,561	48.58	69	3,423	60.87	170
Tripura	2,404	48.03	14	3,455	71.05	73
Uttara Pradesh	961	19.01	19	712	14.03	3
West Bengal	3,197	63.93	88	5,644	112.72	93
Andaman & Nicobar	1,922	37.10	60	—	—	—
Delhi	2,030	40.74	0	1,918	38.57	0
Pondicherry	2,911	58.15	96	4,479	89.59	202
Total	1,946	30.69	205	2,018	36.42	56

5.3.5. Depth and spread of CCIS coverage

The number of households covered under CCIS during 1987-88 accounted for 6.7 per cent of the total number of holdings and the area covered was 6.82 per cent of the total gross sown area in the country (Table 5.11). The number of farms and area covered under CCIS declined both in absolute and relative terms during the year

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1990-91 and both accounted for less than three (2.57 % holdings and 2.41 % of GCA) per cent of the total number of farms as well as the total area. The cumulative total of the number of farmers covered under CCIS from 1985 till kharif 1999 was 76.27 million and area insured was 127.57 million ha. The cumulative number of farmers and the area covered under CCIS accounted for less than 5 per cent (4.6 per cent) of the holdings and gross sown area during 1985-86 through 1999-2000.

Table 5.11 : Percentage of Households and Area Covered under CCIS to Total Holdings and Gross Sown Area

Years	Total Holdings (in Millions)*	Gross Sown Area (Million Ha)	Insured under CCIS		% of Insured to Total	
			Farmers	Area In Ha	Holdings	Gross Sown Area
1985	97.16	178.46	3.85	7.69	3.96	4.31
1986	99.06	176.41	5.08	9.84	5.13	5.58
1987	100.95	170.74	6.76	11.65	6.70	6.82
1988	102.85	182.28	3.85	6.25	3.74	3.43
1989	104.74	182.27	4.89	7.60	4.67	4.17
1990	106.64	185.74	2.74	4.48	2.57	2.41
1991	108.43	182.24	4.56	7.98	4.21	4.38
1992	110.21	185.70	5.02	8.43	4.55	4.54
1993	112.00	186.58	5.05	8.08	4.51	4.33
1994	113.79	188.05	5.19	8.24	4.56	4.38
1995	115.58	187.47	5.66	9.07	4.90	4.84
1996	116.74	189.59	5.85	9.46	5.01	4.99
1997	117.89	190.57	6.00	9.69	5.09	5.08
1998	119.05	193.03	6.20	10.13	5.21	5.25
1999	120.20	190.32	5.58	8.97	4.64	4.71
Total	1,645.28	2,769.45	76.28	127.56	4.64	4.61

Note: Number of holdings was estimated for the period between quinquennial surveys by interpolation assuming linear growth trend. The number of holdings during 1996-97 through 1999-2000 was estimated by extrapolation by assuming 5 per cent linear growth in the number of holdings after 1995-96. The number of holdings grew @ 9.75 per cent per annum between 1985-86 and 1990-91 and by 8.39 per cent per annum during 1990-95.

Similarly, the sum insured under CCIS shared 15 per cent of the total short-term credit extended by the institutional sources like Cooperative banks, commercial banks and RRBs indicated. The volume of short-term credit (sum) insured under CCIS ranged from 11 per cent of the total short-term credit disbursed during 1990 to 29.3 per cent in 1987-88 (Annex Table 6). The area covered under CCIS during 1985 through 1999 ranged from just 2 per cent of the

gross cropped area in the country in 1990-91 to 5.31 per cent in 1987-88. Area covered under CCIS hovered around 4 per cent of the gross cropped area in the early mid 1990s and around 4.5 per cent in the second half of 1990s.

5.3.6. Coverage of CCIS by farm size groups

Small and marginal farmers together shared more than 70 per cent of the holdings and 30 per cent of the area during 1985-85 and the share of small and marginal holdings and area operated further increased in the following years due to land fragmentation and family divisions. Small and marginal farmers are worst affected due to production and income instability. Fragile resource base and lack of cushioning or social security measures may lead to distress sale of assets and even to starvation. Since, CCIS is linked to institutional credit and large farmers have better access to institutional credit and hence, it was feared that the large farmers would be the major beneficiaries of CCIS (Prabhu and Ramchandran 1986). However, the analysis of CCIS data indicates that small and marginal farmers had sizeable share (though not exactly corresponding to their share in total holdings) in the CCIS beneficiaries. Small and marginal farmers accounted for 57 to 61 per cent of the total farmers and shared 31 to 41 per cent of the area insured under CCIS during 1985 through 1994 kharif season (Table 5.12).

Table 5.12 : Share of Small and Marginal Farmers in the CCIS in Terms of Area, Sum Insured and Premium Collected

(In Percentages)

Year	Kharif Season				Rabi Season			
	Far-mers	Area	Insured Sum	Pre-mium	Far-mers	Area	Insured Sum	Pre-mium
1985	61	40	41	43	72	43	66	67
1986	57	33	39	41	66	45	55	55
1987	60	38	40	43	80	54	72	73
1988	58	32	40	44	81	74	80	82
1989	59	39	46	49	70	45	59	61
1990	57	31	36	40	73	49	62	64
1991	58	34	41	44	70	46	62	64
1992	59	39	45	48	73	50	65	67
1993	61	41	47	50	71	48	64	66
1994	59	36	45	47	71	47	61	63

Source : Adopted from Mishra, 1996

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The share of small and marginal farmers in the total number of farmers as well as area covered during the rabi season was higher when compared to their share during kharif season. The cumulative total of small and marginal farmers accounted for 62 per cent, 39 per cent, 47 per cent and 49 per cent respectively of the total number of farmers, area covered, sum insured and premium paid for CCIS during 1985-86 through 1994-95. The premium paid by small and marginal farmers varied between 40 per cent of the total premium during 1990 kharif and 50 per cent during 1993. Similarly, premium paid by small and marginal farmers shared ranging from 55 per cent of the premium collected by GIC for the rabi season during 1986 to 82 per cent in 1988. The overall cumulative share of premium paid by small and marginal farmers was 49 per cent of the total premium earned by GIC between 1985 and 1994. The proportion of premium paid by small and marginal farmers was always higher than their share in the sum insured under CCIS.

5.4. Financial Performance and Viability of CCIS

The balance between expenditure and the revenue earned determines the viability as well as sustainability of any developmental programme. The cost of insurance has two components: cost of risk (indemnities) and the administrative cost. The administrative costs may remain relatively constant over time but indemnity cost may vary over time. The administrative costs include handling, processing and retrieving information as well as expenditure on field staff.

The administrative cost in crop insurance programme is conditioned by the approach followed. Since, we follow the area approach, administrative costs associated with the insurance programme are relatively small. The yields data are derived from crop cutting experiments, which are otherwise, carried out to generate agricultural statistics by the state department of agriculture. The Directorate of Agriculture conducts crop-cutting experiments and communicates the yield data for notified crops to GIC for further processing and necessary action. Similarly, the premium for crop insurance is built-in component of the loan amount, which is collected by the financing institutes and passed on to the GIC of India. The administrative costs for crop insurance programme in most of the countries have been relatively small (Pomareda 1986). The administrative cost on field staff may increase if the Government decides to adopt individual approach instead of area approach. The indemnities paid forms the major portion of cost component of the agricultural insurance programme. The indemnities accounted for

about 93 per cent of the total cost of the national programmes in Brazil and Costa Rica and for 86 per cent in Mexico. Though, the amount spent on administration is not readily available, the expenditure on indemnity payments forms the major part of the cost incurred for agricultural insurance programme.

The crop insurance scheme designed and operated in India during 1973-76 was primarily based on individual approach. The scheme was discarded as the annual losses were very high wherein indemnities paid were eleven times the premium collected. The pilot insurance scheme based on area yield insurance was implemented from 1979-80 through 1984-85. The scheme proved to be successful. The total amount paid as indemnity claims was Rs. 15.57 million as against the premium collected was Rs. 19.5 million. In other words, the amount collected as premium exceeded the indemnities paid during 1979-80 through 1984-85. Thus the pilot project was economically viable. The CCIS implemented from 1986 onwards was based on area yield approach.

The total indemnity claims paid by GIC from 1986 through 1999 in the country were to the tune of Rs 23,038.54 million as against Rs. 4,035.59 million collected as premium. The claim (indemnity) premium ratio (loss ratio) was very high during the initial three kharif seasons, declined to less than 3.5 in the following two years (Table 5.13). Loss ratio again increased to more than 10 during 1990-91 and 1991-92 kharif. However, it was less than 5 in the following years except in 1999-2000. The overall loss ratio for kharif season starting from 1985 through 1999 works out to 6.68, indicating that GIC paid Rs. 6.68 as indemnity claim for per rupee of premium collected for kharif crops. The average premium charged ranged between Rs. 1.49 and Rs. 1.75 per 100 rupees of sum insured.

The claims paid for kharif crops accounted for 95 per cent of the total claims. The claim premium ratio was 6.68 for kharif crops when compared with just 1.62 per cent for the rabi crops. The claim premium ratio for kharif crops varied between 2.17 in 1994 and 14.52 in 1987. Similarly, the claim premium ratio for rabi crops varied from a minimum of 0.7 in 1985 to 2.45 in 1995. It is interesting to note that the claim premium ratios during 1985, 1994 and 1998 rabi seasons were less than unity indicating that the indemnities paid for rabi crops in the respective years were lower than the premium collected. Similarly, the claims/indemnities paid for rabi crops during 1986 and 1989 were marginally higher than the premium collected in the respective years.

The overall loss ratio for the years 1985 through 1999 was 5.71 and it ranged between 1.95 in 1994-95 and 11.13 during 1991-92. The claims paid were more than 5 times higher than the premium collected and accounted for more than 9 per cent of the total sum insured. The losses suffered by CCIS can be attributed to consecutive drought years, low rate of premium and adverse selection of states (states with less production risk opting out of CCIS) and adverse selection of areas and crops within the states covered under CCIS. As indicated by Mishra (1996), the first three years after introduction of the CCIS were drought years in many areas of the country. Gujarat experienced severe drought during 1987 and Saurashtra, which contributed about one third of the total groundnut production in the country, was deficient in precipitation by 74 per cent and this led to huge payments of indemnity for groundnut crop in Gujarat.

Table 5.13 : Premium Rate, Loss Ratio and Claims Paid as the Percentage of Sum Insured

Year	Kharif			Rabi			ALL		
	Pre-mium Rate	Loss Ratio	Claims as Per-centage Sum Insured	Pre-mium Rate	Loss Ratio	Claims as Per-centage Sum Insured	Pre-mium Rate	Loss Ratio	Claims as Per-centage Sum Insured
1985	1.74	8.93	15.50	1.88	0.70	1.31	1.78	6.28	11.17
1986	1.75	11.30	19.78	1.86	1.02	1.89	1.78	8.92	15.83
1987	1.67	14.52	24.32	1.86	1.37	2.54	1.73	10.36	17.91
1988	1.61	3.29	5.30	1.90	1.24	2.36	1.68	2.75	4.62
1989	1.66	2.38	3.94	1.82	1.04	1.90	1.68	2.16	3.64
1990	1.49	10.65	15.83	1.79	1.15	2.06	1.57	7.67	12.03
1991	1.55	13.53	20.97	1.77	1.65	2.92	1.59	11.13	17.69
1992	1.58	2.36	3.72	1.79	1.65	2.96	1.61	2.22	3.59
1993	1.58	8.58	13.53	1.76	2.34	4.12	1.61	7.38	11.88
1994	1.55	2.17	3.36	1.75	0.99	1.72	1.58	1.95	3.09
1995	1.54	4.82	7.40	1.82	2.45	4.47	1.59	4.34	6.88
1996	1.54	4.98	7.68	1.81	2.32	4.19	1.60	4.38	6.98
1997	1.54	5.04	7.76	1.79	1.95	3.49	1.58	4.51	7.11
1998	1.57	3.19	4.99	1.73	0.80	1.38	1.59	2.77	4.41
1999	1.55	10.49	16.30	—	—	—	1.55	10.49	16.30
Total	1.58	6.68	10.54	1.81	1.55	2.79	1.62	5.71	9.22

The pilot scheme on crop insurance implemented between 1979-80 through 1984-85, proved financially sound (premium collected were higher than the payments made against indemnities) and this was mainly due to the fact that the premium rates (ranging from 5 to 10 per cent) were closer to actuarial rates. The CCIS suffered losses throughout its period as the premium charged was not based on actuarial rate. The premium rate charged to various crops was much below the premium rates suggested by Prof. Dandekar for pilot scheme to operate on no loss no profit basis. Even the GIC had calculated different premium rates for each crop for different regions in the country considering variability in the productivity of concerned crop (Dandekar 1985; Prabhu and Ramchandran 1986). However, fearing low participation by farmers in the event of high premium rates the government decided to charge lower rate of premium and also subsidise the premium for small and marginal farmers. Uniform premium rate across the country despite wide variability in productivity resulted in opting out of states, which were endowed with less hostile production environment. This automatically led to adverse selection. The variability in production for a few crops in major states has been presented in Annex Table 7.

The performance of the Indian Comprehensive Crop Insurance Scheme from 1985 to 1993 has been assessed by Moslely and Krishnamurthy (1996) in relation to a critical literature which argues that comprehensive agricultural insurance is subject to insuperable moral-hazard obstacles. The Indian scheme of crop insurance has incurred heavy financial losses. On the benefit side, sample data from Andhra Pradesh suggest that some farmers have converted to yield-raising techniques as a result of the presence of the insurance scheme, but that the scheme has not brought about any improvement in loan repayment performance even though that was the scheme's explicit objective.

As stated earlier, some of the states claimed very large amounts of indemnities over the years when compared to their other participating counterpart states (Table 5.14). Gujarat shared more than 50 per cent of the total indemnity payments made under CCIS in 8 of the 15 years with an average share of 47 per cent of the indemnities paid between 1985-86 and 1999 rabi season in the country. During the years 1985-86, 1987-88, 1990-91, 1991-92, 1993-94, 1995-96 and 1999-2000, Gujarat accounted for 63 per cent, 74 per cent, 82 per cent, 67 per cent 86 per cent, 56 per cent and 59 per cent respectively of the indemnity paid in the entire country. The indemnity claims were so high that the Government of

India had to set up a committee to verify the claims arising from the state. GIC, the agency implementing CCIS, engaged services of two consultants to study insurance claims of Kharif 1990. Agricultural Finance Corporation had to study claims of Amreli and Jamnagar districts whereas another agency, Voltas International limited was assigned the study related to Junagadh and Rajkot (Mishra 1996). Maharashtra claimed two thirds of the indemnities during 1988-89 whereas Andhra pradesh accounted for 66 per cent, 44 per cent, 48 per cent and 45 per cent of the indemnity claims during 1989-90, 1994-95, 1996-97 and 1997-98, respectively. On average Andhra Pradesh stood second next to Gujarat followed by Maharashtra, Orissa and Madhya Pradesh.

Table 5.14 : Percentage Share of Major States in the Total Claims Paid Between 1985 and 1999

Years	Andhra Pradesh	Gujarat	Madhya Pradesh	Mahara-shtra	Orissa	Total Claims*
1985	6.46	**62.81**	0.42	23.69	0.14	872.63
1986	22.60	29.74	6.44	23.02	0.09	1,739.58
1987	3.99	**74.41**	1.83	6.17	4.56	2,894.73
1988	6.83	3.44	9.30	**66.27**	1.39	330.57
1989	**65.60**	18.75	2.45	2.26	0.69	372.86
1990	5.59	**81.63**	0.25	1.04	3.27	855.97
1991	15.78	**66.87**	3.28	10.09	0.38	2,013.04
1992	**33.64**	1.72	5.36	2.56	9.17	509.55
1993	2.56	**86.17**	0.23	0.49	0.62	1,886.11
1994	**44.28**	7.77	6.05	12.81	15.70	580.23
1995	12.48	**56.54**	3.37	9.44	5.10	1,489.65
1996	**48.16**	2.26	6.28	2.98	26.01	1,722.14
1997	**44.64**	0.92	12.95	23.19	3.70	1,870.24
1998	24.26	18.88	16.38	11.62	14.46	1,284.39
1999	21.27	**59.21**	0.92	1.27	14.41	4616.87
All	20.91	47.31	4.33	9.36	7.69	23,038.56

Note : Claims in million rupees

Thus, the foregoing analysis suggests that the rate of premium should be calculated based on actuary principles to incorporate the risk faced by producers in different states. On an average, the premium needed to cover only indemnity payments of crop insurance

at the national level would have been 5 to 6 times higher than the premium rates charged under CCIS. The rate of premium ranging from 1.5 per cent of the loan amount (production credit) for wheat to 3.5 per cent for pearl millet and oilseeds is too low or inadequate to meet the indemnity payments.

Risk involved in crop production varies across space and crops. Some crops are more sensitive to deficit or erratic rainfall, cold spell and other weather parameters than the others. Paddy is grown in almost all the states and has the largest area among kharif crops in the country. Premium collected towards insurance of paddy was Rs. 217.52 crores accounting for 54 per cent of the total premium amount collected by the GIC from 1985-86 to 1998-99. Similarly, the claims paid were to the tune of Rs. 576.26 crores sharing 25 per cent of the total claims paid. The loss ratio (claims/premium ratio) was 2.65 for the entire period of 14 years (Table 5.15, Fig. 5.8). Groundnut is an important cash crop grown widely all over the country. However, delay in precipitation during critical crop growth period and adverse weather conditions impinges upon the productivity of groundnut significantly. The premium collected for groundnut was Rs. 604.2 million as against Rs. 12,216.8 million paid as indemnities during the reference period.

Table 5.15 : Premium and Claims for Major Crops (1985-86 to 1998-99)

Crop	Premium		Claims		Loss Ratio
	Rs. in Millions	Per cent	Rs. in Millions	Per cent	
Paddy	2175.2	54	5762.2	25	2.65
Wheat	523.6	13	461.0	2	0.88
Groundnut	604.2	15	12216.8	53	20.22
Sorghum	362.5	9	1844.0	8	5.09
Pearl millet	241.6	6	1844.0	8	7.63
Pulses	40.2	1	230.5	1	5.73
Others	88.29	2	680.04	3	7.70

Source: Parchure (2002)

Fig. 5.8

Percentage Share of Major Crops in Total Premium and Claims
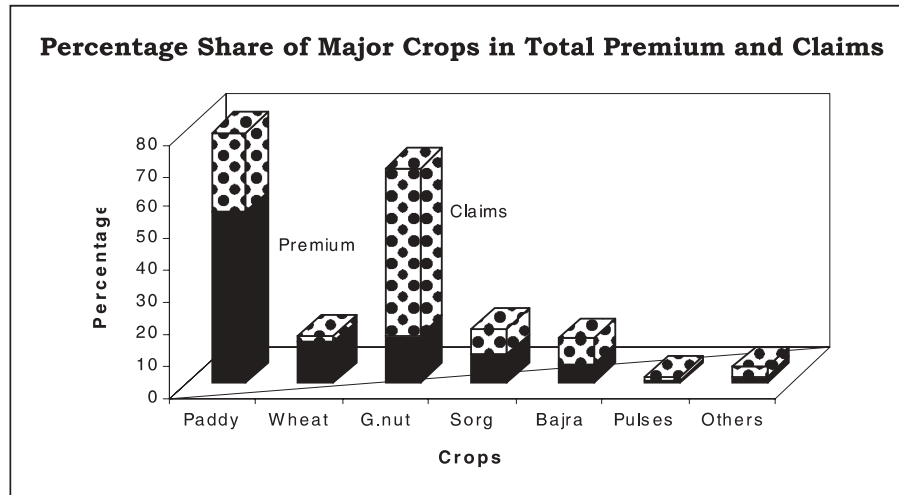
The indemnities paid for groundnut accounted for more than half (53 per cent) of the total claims as against 15 per cent contribution to the total premium. The claim premium (loss ratio) for groundnut was 20.22, highest among all the crops. Wheat crop shared 13 per cent of the premium amount and accounted for just 2 per cent of the total claims. The cumulative loss ratio for wheat crop was less than unity (0.88) indicating that the premium collected was higher than the claims paid for wheat crop. Among the coarse cereals, sorghum and pearl millet shared 9 and 6 per cent of the premium amount and 8 per cent of the claims each respectively. However, loss ratio was higher for pearl millet (7.63) when compared to sorghum (5.08). The claims paid for pulses were more than 5 times of the premium collected.

Premium rates are estimated using different techniques such as "Exposure Rating Technique" or "Experience rating" which has two components. One is pure risk premium which is a ratio of the expected loss to the maximum (guaranteed yield level) loss. The second component consists of reserve for unexpected heavy losses, administrative cost, anti selection, moral hazard, data inconsistency and finally profit margin. Actuarially fair or pure premium rates occur when the expected indemnity (loss) equals the loss premium. Thus, the actual premium rate differs from pure premium rate as it includes reserves for catastrophic events, administrative costs, profit margins, etc. Though CCIS is implemented by GIC, various functions are carried out by different agencies and hence, the GIC do not pay for all the services rendered by the various agencies. The State department of agriculture notifies the area and crops eligible for

insurance cover based on the area under the crop during the reference season. The financial institutions deduct the premium while disbursing loans to the farmers and send consolidated statement to GIC along with the premium on the pre-fixed due date. The results of crop cutting experiments for specific crops and area are transmitted to GIC for the calculation of indemnity payments if any. Thus, the expenditure on administrating the CCIS is minimized. However, cost of administration is an important component and should be included in the pure risk premium. The cost of admini-stration incurred by the GIC during 1985-86 through 1994-95 was Rs. 131.58 million accounting for less than 0.5 per cent of the sum insured. Assuming that the administrative cost incurred by the other agency did not exceed three times that incurred by the GIC. Mishra (1996) estimated the total cost of administration to be Rs. 526.32 million. The indemnity payment between 1985 and 1994 was to the tune of 12.05 billion as against the premium of Rs. 1.95 billion. Thus, the administrative cost (Rs. 0.526 billion) plus indemnity payments (12.05) add up to Rs. 12.58 billion against Rs. 1.95 billion collected as premium during the same period. This implies a government subsidy of Rs. 10.63 billion accounting for 84 per cent of the total cost of the scheme (Mishra 1996).

The actual premium (without government subsidy) required to cover the indemnity payments and administrative costs is in the range of 12 to 20 per cent. These are high compared to the cost of non-agricultural insurance. It is so high that farmers may be reluctant to participate in the insurance programme. Due to typical nature of agriculture most of the multi-peril crop insurance programmes all over the world are in public sector. The Government through subsidies in premium and allowance provides the financial assistance for administrative costs. The insurance programme to be self-sustained should earn the premium and interest on the surplus, which will take care of indemnity payments and administrative costs. In principle, those farmers with the riskiest yields should pay the largest premium. However, calculating premium for each individual may not be practically feasible as it demands lot of data and time. The homogeneous area approach as suggested in the literature is not fool proof as small difference in the altitude, soil types and resource endowment result in sizable variations in the yield levels. However, homogeneous area approach is a most practicable approach. It reduces the administrative and the operational costs of the project and minimizes adverse selection and moral hazard problems associated with insurance. Facilities for reinsurance will help the insurance agency to overcome catastrophic losses.

5.5. Experimental Crop Insurance Scheme (ECIS)

To extend the benefits of CCIS to more number of small and marginal farmers, the Ministry of Agriculture, Government of India suggested a new model of crop insurance. The General Insurance Corporation of India as well as Ministry of Finance were reluctant partners to this idea. However, in April 1997, the government cleared the agriculture ministry's proposal for crop insurance for farmers over-ruling the earlier protest by the Finance ministry and the General Insurance Corporation of India. The **Experimental Crop Insurance Scheme (ECIS)** was implemented during 1997-98 Rabi season, included loanee and non-loanee small and marginal farmers only. However, no attempt was made to improve the viability of the scheme. The entire burden of implementing the scheme was passed on to the government, and the central and state governments shared the premium in 4:1 proportion. The scheme was implemented only for a season as the financial burden inflicted by the scheme was too high. The scheme covered a few crops, the sum insured was restricted to the loan amount for loanee and eligibility of loan amount for non-loanee farmers with a ceiling of rupees ten thousand. The compensation had no relevance to the actual loss suffered by the farmers. The scheme was implemented as an experimental project in 25 districts spread over 9 states. The scheme covered 0.45 million small and marginal farmers. The total sum insured was to the tune of Rs. 1,681.1 million. The total claims paid were Rs. 378 million against a premium of Rs. 28.4 million resulting in claim premium ratio of 13.31.

The Comprehensive Crop Insurance Scheme (CCIS), which was introduced in 1985 and continued till 1999, had some in-built weakness or shortcomings. These shortcomings impinged on the viability of the scheme. The major shortcomings of the scheme were as follows:

5.6. Shortcomings of CCIS

Area approach : In the present CCIS, taluka is a unit for notification. A taluka covers too large a geographical area to be treated as homogeneous as soils as well as climatic conditions vary drastically within a taluk. There are instances where crop losses occurred in some villages and farmers did not get the benefit of the scheme. This makes the farmers disinterested and reluctant participant in the CCIS. Therefore, it is desirable to have smaller area units or defined areas for the calculation of premium and indemnity payments.

Coverage : The sum insured is limited to the amount of crop loan borrowed from formal credit institutions. However, the crop loan does not cover the entire expenditure made by the farmer on crop production. In the event of crop failure, the farmer suffers tremendous losses. Only loanee farmers are eligible for participation the CCIS or rather it is compulsory for them to buy insurance cover for the crop loans borrowed from institutional sources. It is observed that farmers take out loans in the name of insured crops and invest it in the production of both insured and un-insured crops with a view to maximising their returns within the available resources.

Threshold yield : It is 60 to 90 per cent of the average yield per hectare during the past 5 years of the defined crop. However, yield levels are showing increasing trend over the years due to adoption of improved technology and increased use of inputs in crop production. This dampens the interest of progressive farmers in CCIS.

Non-borrower farmers : Farmers who are borrowers of crop loans from institutional sources are eligible for insurance coverage under CCIS. Non-borrowing farmers cannot get such coverage and in the process a vast majority of the non-borrower farmers are left out of the insurance cover. Sometimes the defunct credit institutions such as cooperatives in the village and problems associated with accessibility to other formal credit institutions deprive farmers from buying insurance cover.

Voluntary participation : The insurance whether it is crop insurance or any other variant is based on the law of large numbers which influences the premium and indemnity calculations. The success of any insurance scheme is conditioned by the participation of a large number of people over time and space. The voluntary nature of participation gives rise to adverse selection wherein higher risk individuals are inclined to subscribe to the scheme heavily. At the macro level, it is for the state governments to decide about participation in the scheme. However, in order to avoid adverse selection it is imperative to make participation of the state compulsory. This will help pull the risk across the state. If necessary, a few innovative schemes within CCIS may be operated to cover specific risks and have lower premium for the states with more stable production.

Premium rates : The risk associated with crop production or variability in crop yields for different crops varies from region to region and across the states. Premium rate is uniform for the entire country and there is no differential rate of premium for low risk and

high-risk areas. Moreover, the premium rates charged are too low and have no actuarial basis.

Crop Coverage : The CCIS covers cereals, pulses and oilseeds and some of the important cash crops such as cotton are left out of the system. The farmers have the incentive to borrow in the name of insurable crop and divert the credit for other crops. This may lead to the problem of moral hazard. Hence, it is advisable to include all the major crops under the fold of CCIS. The area under commercial and horticultural crops is growing steadily over the years. Production of commercial crops demands heavy investment and faces higher level of production and market risks. But these crops are left outside the purview of crop insurance.

Risks or perils covered : CCIS provides insurance cover against all types of risks that affects average yields of the insured crops in the area. In other words, it is a multi-peril crop insurance scheme. The CCIS is in the public sector and is supported by budgetary resources of the central and state governments.

Time lag for indemnity payments : The time taken for the settlement of claims varies from 6 months to one year. This puts resource poor small and marginal farmers to great hardship. The farmer faces liquidity crunch due to reduction in crop production or complete crop failure, on the one hand and he cannot borrow for the next season as the indemnity payments due has not reached the bank. It is imperative to settle the claims as soon as the crop yields are made available to the GIC.

Reserve and reinsurance : The CCIS has created reserves in the form of State Crop insurance Fund. However, these funds are inadequate to meet the demand for indemnity payments at the time of catastrophic losses. There is heavy dependence on government budgetary resources. As a result there are delays in settling the claims. Reinsurance is another alternative to meet unforeseen payments for catastrophic losses. However, the CCIS in its present form and considering the business parameters like claim premium ratios, premium rates, etc., cannot get access to reinsurance in the international market.

CHAPTER 6 :
NATIONAL AGRICULTURE INSURANCE SCHEME (NAIS) OR RASHTRIYA KRISHI BIMA YOJANA (RKBY)

6.1. Introduction

In order to address some of the shortcomings and improve the scope and contents of CCIS, the government of India expressed its intentions to launch a new crop insurance scheme during 1998-99 budget speech. A broad-based **National Agriculture Insurance Scheme (NAIS)** or Rashtriya Krishi Bima Yojana (RKBY) was introduced with effect from the Rabi season of 1999-2000. The scheme was designed to cover all the farmers irrespective of the size of holding and both borrowers and non-borrowers of the institutional credit. NAIS provides for greater coverage of crops and risk commitment (sum insured) when compared with CCIS. The new crop insurance scheme was intended to address the issue of financial viability by raising the premium to 4 per cent for food crops and still higher premium for cash crops like sugarcane, potato, ground-nut, etc. The government intended to bring down the claim premium ratio from more than 5 to a manageable 1.4. The government also proposed to set-up a separate subsidiary company under GIC to operate the scheme and give it freedom to alter or modify insurance charges to make the venture internally viable. Finally, Agricultural Crop Insurance Corporation Ltd. came into being in 2003.

The new crop insurance scheme NAIS / RKBY was introduced during rabi 1999-2000 in 9 States / Union Territories. The states/ UT, which adopted the new scheme during 1999-2000 Rabi season, were Assam, Goa, Gujarat, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Orissa and Pondicherry. The number of States/UT implementing NAIS increased to 17 in Kharif 2000 and reached 21 in kharif 2002. However, prosperous states like Punjab and Haryana preferred to stay out. Sates like Rajasthan having large area under rain-fed agriculture also preferred not to join the scheme.

6.1.1 Objectives of the NAIS/RKBY are

♦ To provide insurance coverage and financial support to the farmers in the event of crop failure of any of the notified crop as a result of natural calamities, pests and diseases.

♦ To encourage the farmers to adopt progressive farming practices, high value inputs and improved technology in Agriculture.

♦ To help stabilize farm incomes, particularly in disaster years.

The crops covered under the programme are:

(a) Food crops (Cereals, Millets and pulses)

(b) Oilseeds and

(c) Annual commercial/horticultural crops Sugarcane, Cotton and Potato.

Ginger, onion, turmeric and chilies are covered under insurance during the second year of the scheme. Other annual commercial/ horticultural crops have also been brought under insurance cover in the subsequent years depending on the availability of crop yield data.

The scheme has been extended to all the states. The state has the responsibility to extend it for all the crops identified for coverage in a given year. Moreover, states / union territories once opting for the Scheme have to implement it for a minimum period of three years. The participation in NAIS/RKBY is compulsory for farmers growing notified crops by availing crop loans from formal credit institutions. However, non-borrower farmers growing notified crops are also eligible to opt for the scheme on voluntary basis.

The insurance cover provided by RKBY is multi-peril in nature. RKBY covers yield losses due to non-preventable risks, which includes

 (i) Natural fire and lightning

 (ii) Storm, Hailstorm, Cyclone, Typhoon, Tempest, Hurricane, Tornado etc.

(iii) Flood, Inundation and Landslide

(iv) Drought and dry spells

 (v) Pests/diseases etc.

Losses arising out of war and nuclear risks, malicious damage and other preventable risks are excluded from the insurance cover.

6.1.2. Sum insured

In case of loanee farmers the Sum Insured (SI) will be equal to the amount of crop loan advanced. However, the farmer has the

option to insure the amount equivalent to the value of threshold yield of the insured crop. A farmer has the option to insure his crop beyond the value of threshold yield level (up to 150% of average yield) of the crop in the notified area on payment of premium at commercial rates.

The indemnities are worked out based on the basis of average yield levels in the past and the actual yield harvested by the farmers. The NAIS/RKBY has the provision to compensate individual farmers who suffer crop loss due to localized event like hailstorm or floods. However, individual based assessment in case of localized calamities would be implemented in limited areas on experimental basis initially and shall be extended to other areas based on the experience gained.

6.1.3. Premium rates

The Government at the time of introduction of NAIS decided to continue with the 'flat rate' system of premium followed in the CCIS. Flat rate is crop specific and depends on the level of indemnity desired by the farmer and is the same across the whole country. The flat rate of premium applies to all the major crops including foodgrains, pulses and oilseeds. The limited number of commercial and horticultural crops, which are included in the list of insurable crops, attracts actuarial rate of premium. The premium rates fixed for the crop year 1999-2000 have been presented in Table 6.1. The premium rates being charged currently are ad-hoc in nature. The actuarial premium will be charged for cereals, millets, pulses and oilseeds within a period of five years.

Table 6.1 : Premium Rates Charged under NAIS/RKBY

Sl.No.	Season	Crops	Premium rate
1	Kharif	Bajra and oilseeds	3.5 per cent of Sum Insured (SI) or Actuarial rate which-ever is less
		Other crops (cereals, other millets & pulses)	2.5% of SI or Actuarial rate whichever is less
2	Rabi	Wheat	1.5% of SI or Actuarial rate whichever is less
		Other crops (other cereals, millets, pulses & oilseeds)	2% of SI or Actuarial rate whichever is less
3	Kharif and Rabi	Annual commercial/ horticultural crops	Actuarial rates

A consulting firm has calculated the actuarial premium rates for the basic crops (foodgrains, pulses and oilseeds) and this is based on "Exposure Rating Technique" which uses the principle of 'Normal distribution/Central Limit Theorem'. The actuary has provided readymade tables of premium rates at various levels of indemnity corresponding to coefficient of variation (C.V.) in crop yield based on 10 year data. The risk premium calculated by the consulting actuary includes: (a) pure risk premium, (b) administrative cost, (c) reserve for unexpected heavy losses, (d) escalation in the scale of finance / sum insured, (e) adverse selection and moral hazard, and (f) profit margin.

The pure risk premium accounts for only 60 per cent of the total actuarial premium rates estimated for commercial and horticultural crops whereas it shares about 85 per cent of the premium amount for basic crops like cereals, pulses and oilseeds. However, the assumption of normal distribution of yields used in the Exposure Rating Technique for calculating the premium rates has been questioned by many quarters. The implementing agency has also felt it inappropriate and inadequate. Hence, GIC / Agricultural Insurance Corporation of India has decided to recalculate the actuary premium rates.

The premium rate charged to the small and marginal farmers is half of the normal rate. The Government of India and the State Government share the subsidy on the premium given to small and marginal farmers in equal proportion. This subsidy will be gradually phased out on sun-set basis over a period of five years after reviewing the financial results of NAIS/RKBY. The premium subsidy for 2002-2003 was 30 per cent.

6.1.4. Funding

All the claims related to food crops and oilseeds beyond 100 per cent of the premium shall be borne by the government of India and the States on 50:50 basis till a complete transition is made from flat rate to actuarial regime. The claims beyond 150 per cent of the premium in the first three years and 200 per cent of the premium for an extended period of additional three years thereafter shall be met by implementing agency. Claims beyond the limits of implement-ing agency shall be paid out of the Corpus fund for a period of three years. However, the period of three years stipulated for this purpose will be reviewed on the basis of the financial results after the first year of implementation and the period will be extended to five years

if considered necessary. In the case of commercial / horticultural crops, the implementing agency shall bear claims up to 150 per cent of the premium in the first three years and 200 per cent of the premium thereafter subject to satisfactory claims experience. The claims beyond the limits of implementing agency shall be paid out of Corpus fund. A Corpus Fund is to be created with contributions from the Government of India and State/Union Territories on 50:50 basis to meet the catastrophic losses. A portion of Calamity Relief Fund will be used for contribution to the Corpus Fund.

6.1.5. Homogeneous area approach

The scheme operates on the basis of "Area Yield Approach", i.e., Defined Area for each notified crop for widespread calamities and on an individual basis for localised calamities such as hailstorm, landslide, cyclone and flood. The defined Area (i.e., unit area of insurance) may be a Gram Panchayat, Mandal, Hobli, Circle, Block or Taluka etc. to be decided by the state/UT Government. However, each participating State/UT Government will be required to reach the level of Gram Panchayat as a unit in a maximum period of three years. The individual based assessment in case of localized calamities is initially implemented in limited areas on experimental basis before it is extended to other areas based on the field experience.

6.1.6 Estimation of crop yield

The State/UT Government will plan and conduct the requisite number of Crop Cutting Experiments (CCE) for all notified crops in the notified insurance units in order to assess the crop yield. A Technical Advisory Committee (TAC) comprising representatives from N.S.S.O., Ministry of Agriculture (G.O.I) and Implementing Agency shall decide the sample size of CCEs and all other technical matters. The minimum number of CCEs to be carried out at different levels of insurance units has been presented in Table 6.2.

Table 6.2 : Minimum Number of Crop Cutting Experiments Per Unit Area

Sl. No.	Unit Area	Minimum Number of CCEs
1	Taluka / Block	16
2	Mandal / or smaller area comprising 8-10 villages	10
3	Gram Panchayat comprising 4-5 villages	08

6.1.7. Levels of indemnities and threshold yield

The indemnity levels are fixed at 90 per cent, 80 per cent and 60 per cente corresponding to low risk, medium risk and high risk areas based on variability (coefficient of variation) in yields in the past 10 years. The crops are classified as Low Risk when the coefficient of variation (CV) is less than 15 per cent, Medium Risk when the CV is between 16 per cent and 30 per cent and High Risk when the CV is higher than 30 per cent. The insured farmers of the notified area may opt for higher level of indemnity on payment of additional premium based on actuarial rates. The difference between the level of indemnity and the actual yield loss act as a sort of deductible. For example, in the case of 80 per cent indemnity level the farmers assume a deductible equivalent to 20 per cent of yield loss. Indemnity limits are fixed for a crop for the whole state i.e., one indemnity level per crop per state.

The Threshold Yield or the guaranteed yield for a crop in the particular notified area is the moving average based on past three year average yield in case of rice and wheat and five year average in case of other crops multiplied by the level of indemnity. If the actual yield per hectare of the insured crop for the defined area (based on Crop Cutting Experiments) in the insured season falls short of the specified Threshold Yield, all the farmers growing that crop in the defined area are deemed to have suffered shortfall in their yield. The shortfall in actual yield as the proportion of threshold yield times the sum insured is the indemnity claim.

6.1.8. Performance of the NAIS / RKBY

As stated earlier, only 9 States/UT participated in NAIS during 1999 Rabi season. The scheme covered little more than one half (0.58) million farmers and 0.78 million ha of cropped area (Table 6.3). The coverage under NIAS increased dramatically after kharif 2000. The total number of farmers covered under NAIS increased from 8.41 millions in 2000 Kharif to 9.75 million by 2002 Kharif season. Similarly, crop area covered reached to 15.53 million ha in Kharif 2002 as against 13.22 million ha during Kharif 2000. The number of participating farmers and area covered under NAIS were lower during Rabi season when compared with Kharif season. The same was true in the case of CCIS also. In 2000-01 rabi season, 2.09 million parmers participated in crop insurance and insured 3.11 million ha of cropped area. The number of participating farmers declined slightly in the following year but the area covered increased

modestly. However, the number of farmers as well as the area covered under NIAS increased during 2002-03. The cumulative total of farmers and area covered under NIAS during 1999-2000 through 2002-03 was 33.82 million farmers and 52.71 million ha area, respectively.

Table 6.3 : Coverage under NAIS / RKBY (1999 to 2003)

Year/ Season	No of States/ UTs	Farmers (Million Nos)	Area (Million Ha)	Sum Insured (Rs. Million)	Premium (Rs. Million)
Kharif					
2000-2001	17	8.41	13.22	69,033.83	2,067.34
2001-2002	19	8.70	12.89	75,024.61	2,616.18
2002-2003	21	9.76	15.52	94,294.39	3,272.22
Total kharif	—	26.87	41.63	238,352.84	7,955.74
Rabi					
1999-2000	09	0.58	0.78	3,564.07	54.25
2000-2001	18	2.09	3.11	16,026.85	277.88
2001-2002	20	1.96	3.15	14,975.11	301.47
2002-2003	21	2.33	4.04	18,374.62	385.02
Total rabi	—	6.95	11.08	52,940.65	1,018.62
All					
1999-2000	09	0.58	0.78	3564.07	54.25
2000-2001	18	10.50	16.33	85060.69	2345.22
2001-2002	20	10.65	16.03	89999.72	2917.65
2002-2003	21	12.09	19.56	112669.01	3657.24
Total all	—	33.82	52.71	291293.49	8974.36

The total sum insured during kharif and rabi season taken together was to the tune of Rs. 291,293.49 million and the premium collected was Rs. 8,974.36 million. The average premium charged during kharif was Rs. 3.34 per Rs. 100 of sum insured during kharif season as against Rs. 1.92 per hundred rupees of sum insured in rabi season. The average premium rate of Rs. 3.3 indicates the dominance of risky crops like oilseeds and pearl millet in the crop area insured during kharif season.

6.1.9. Number of farmers and area covered under NAIS by States

The number of farmers buying insurance cover under NAIS during rabi 1999-2000 to 2003 ranged from less than thousand

(650) in Sikkim to more than 5 million in Andhra Pradesh and Maharashtra (Table 6.4). Five states, namely, Maharashtra, Andhra Pradesh, Madhya Pradesh, Orissa and Gujarat together accounted for three fourth (73.6 per cent) of the total number of farmers and little more than 75 per cent of the area covered under NAIS. The five states shared 81 per cent of the premium and nearly 80 per cent of the claims.

Table 6.4 : Number of Farmers and Area Covered under NAIS by States

State	Far-mers (Milli-ons)	Area (Mil-lion Ha)	Sum Insured (Mil-lions)	Pre-mium (Mil-lions)	Total Claims (Mil lions)	Claim/ Pre-mium Ratio	% Benefi-ciaries
Andhra Pradesh	5.59	8.02	62,969	1697	3,572	2.10	20
Assam	0.01	0.01	132	3	2	0.53	12
Bihar	0.39	0.43	3,168	72	229	3.18	16
Chhatisgarh	1.58	3.79	7,638	201	1,639	8.17	58
Goa	0.00	0.01	16	0	0	0.88	22
Gujarat	3.64	7.68	57,401	2254	16,535	7.33	92
Himachal Pradesh	0.07	0.04	320	7	49	6.59	86
Jharkhand	0.02	0.02	159	4	3	0.74	8
Karnataka	2.06	3.21	22,353	683	4,283	6.27	51
Kerala	0.12	0.10	1,105	24	63	2.64	15
Madhya Pradesh	4.56	11.65	25,544	832	3,560	4.28	42
Maharashtra	7.86	9.04	53,019	1859	3,122	1.68	28
Meghalaya	0.01	0.01	45	4	3	0.77	18
Orissa	3.23	3.34	24,106	632	3,555	5.63	39
Sikkim	0.00	0.00	6	0	0	2.25	13
Tamil Nadu	0.36	0.63	4,659	94	512	5.42	37
Tripura	0.00	0.00	14	0	0	1.37	21
Uttar Pradesh	2.67	3.84	19,398	381	424	1.12	23
West Bengal	1.30	0.74	6,719	163	47	0.29	8
A & N Island	0.33	0.14	2,421	63	430	6.87	37
Pondicherry	0.01	0.01	102	2	9	5.09	32
Total	33.82	52.71	291,293	8974	38,037	4.24	38

Cumulative total from rabi 1999 to rabi 2003 season.

The proportion of beneficiaries receiving indemnity payments ranged from a minimum of 8 per cent of the insured farmers in Jharkhand and West Bangal to more than 85 per cent of the participating farmers from Gujarat and Himachal Pradesh. The

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number of farmers claiming indemnity payments from above five states accounted for 67 per cent of the total 12.9 million beneficiaries. The claim premium ratio was less than unity in Assam, Goa, Jharkhand, Meghalaya and West Bengal. On the other hand, it was more than 5 in Chattisghar, Gujarat, Himachal Pradesh, Karnataka, Orrissa, Tamil Nadu, A & N Island and Pondicherry. The overall claim premium ration for NIAS was 4.24 at the national level.

6.2 : Number of Farmers and Area Covered under NAIS by Seasons

The number of farmers as well as area covered under NAIS during Kharif accounted for 79 per cent of the total farmers and area in the country (Table 6.5). However, regional differences were quite conspicuous in terms of coverage of area and number of farmers across the states.

Table 6.5 : Number of Farmers and Area Covered under NAIS by Seasons

(In Percentages)

States	Farmers	Kharf Area	Kharf Sum Insured	Claims	Farmers	Rabi Area	Rabi Sum Insured	Claims
Andhra Pradesh	89.8	89.2	89.2	95.0	10.2	10.8	10.8	5.0
Assam	38.1	42.8	36.9	18.3	61.9	57.2	63.1	81.7
Bihar	76.2	76.5	76.6	84.7	23.8	23.5	23.4	15.3
Chhatisghar	98.7	98.4	99.1	99.9	1.3	1.6	0.9	0.1
Goa	85.3	92.8	73.8	95.5	14.7	7.2	26.2	4.5
Gujarat	97.3	97.7	97.9	99.5	2.7	2.3	2.1	0.5
Himachal Pradesh	86.4	78.5	80.8	90.6	13.6	21.5	19.2	9.4
Jharkhand	86.3	81.9	84.3	91.7	13.7	18.1	15.7	8.3
Karnataka	88.0	88.0	90.6	89.5	12.0	12.0	9.4	10.5
Kerala	30.6	33.9	34.5	85.8	69.4	66.1	65.5	14.2
Madhya Pradesh	64.2	59.1	64.3	77.2	35.8	40.9	35.7	22.8
Maharashtra	88.9	90.8	86.8	83.8	11.1	9.2	13.2	16.2
Meghalaya	28.6	41.4	21.0	22.1	71.4	58.6	79.0	77.9
Orissa	77.9	82.9	78.5	98.9	22.1	17.1	21.5	1.1
Sikkim	11.2	12.8	12.7	0.0	88.8	87.2	87.3	100.0
Tamil Nadu	13.7	15.6	15.6	6.9	86.3	84.4	84.4	93.1
Tripura	37.8	63.5	49.8	0.0	62.2	36.5	50.2	100.0
Uttar Pradesh	46.7	40.3	47.7	59.1	53.3	59.7	52.3	40.9
West Bengal	59.8	65.8	51.7	11.2	40.2	34.2	48.3	88.8
A & N Islands	0.10	0.40	0.10	0.0	99.9	99.6	99.9	100.0
Pondicherry	19.1	17.8	18.6	0.0	80.9	82.2	81.4	100.0
Total	79.4	79.0	81.8	91.5	20.6	21.0	18.2	8.5

It is interesting to note that more than 80 per cent of the farmers opting for crop insurance cover from the states/UTs of Sikkim, Tamil Nadu, Andaman & Nicobar and Pondicherry subscribed for rabi crops and only 20 per cent insured kharif crops. Claims or indemnity payments during kharif accounted for 91.5 per cent of the total claims. States like Sikkim, Tripura, Andaman and Nicobar Islands and Pondicherry had less area covered under NIAS during Kharif and there were no claims during the kharif season.

6.3. Average Area Insured, Premium Paid and Claims Per Farmer and Per Ha under NIAS

On an average, little more than 1.5 ha area was insured per farmer under NAIS during Rabi 1999 through Kharif 2002. However, the average area insured per participating farmer varied across the states. The average area insured per farmer was around half ha in the states/UTs of Himachal Pradesh, West Bengal, A & N islands and Tripura whereas it was more than 2 ha per farmer in Chhattisgarh, Gujarat and Madhya Pradesh (Table 6.6). The average sum insured per household ranged from less than Rs. 5,000 in Himachal Pradesh, Goa and Chhattisgarh to more than Rs. 15,000 per farmer in Gujarat and Pondecherry. The average amount insured per farmer under NAIS at the aggregate level was Rs. 8668. Similarly, the average sum insured per ha was Rs. 5,527 and it varied between less than Rs. 3,000 per ha in Chhattisgarh, Goa and Madhya Pradesh to more than Rs. 15,000 per ha in A & N Islands and Tripura.

The average premium paid by the individual farmer ranged between Rs. 79 in Goa to more than Rs. 600 (619) in Gujarat. Similarly, the average premium paid per ha varied between Rs. 41 in Goa and Rs. 570 per ha in Meghalaya. The average amount of indemnity claimed varied from less than Rs. 100 per farmer in Goa (Rs. 69) and West Bengal (Rs. 36) to more than Rs. 1,500 per participating farmer in Pondicherry (Rs. 1,587), Karnataka (Rs. 2,079) and Gujarat (Rs. 4,542). The average claims or indemnities per ha varied from as low as Rs. 37 in Goa to as high as Rs. 3,035 per ha in Anadaman & Nicobar Islands. It is interesting to note that as many as 92 per cent of the farmers participating (in NIAS) from Gujarat, 86 per cent from Himachal Pradesh, and more than 50 per cent each from Chhattisgarh and Karnataka claimed indemnity payments as against less than 10 per cent of the farmers from Jharkhand (7.6 per cent) and West Bengal (7.8 per cent) during 1999 and 2003.

Table 6.6 : Average Area and Sum Insured, Premium Paid and Indemnities Claimed under NAIS by States

States	Area/ Per Far- mer	Sum Insured per (Rs.)		Premium Paid Per (Rs.)		Claim Per		% Far- mers Bene- fited
		Far- mer	Hec- tare	Far- mer	Hec- tare	Far- mer	Hec- tare	
Andhra Pradesh	1.43	11,260	7,855	304	212	639	446	19.51
Assam	0.88	9,551	10,914	236	269	124	142	11.98
Bihar	1.10	8,107	7,384	185	168	587	535	16.48
Chhattisgarh	2.40	4,838	2,015	127	53	1038	432	58.15
Goa	1.90	4,835	2,543	79	41	69	37	21.66
Gujarat	2.11	15,767	7,474	619	294	4542	2153	91.51
Himachal Pradesh	0.58	4,274	7,433	99	172	653	1135	85.54
Jharkhand	1.13	7,395	6,553	173	154	129	114	7.55
Karnataka	1.56	10,854	6,973	331	213	2079	1336	51.01
Kerala	0.86	9,126	10,619	196	228	519	604	14.81
Madhya Pradesh	2.55	5,601	2,192	182	71	781	306	42.49
Maharashtra	1.15	6,741	5,863	236	206	397	345	27.86
Meghalaya	1.07	7,652	7,159	610	570	469	439	18.50
Orissa	1.03	7,470	7,222	196	189	1102	1065	39.07
Sikkim	0.73	8,825	12,054	88	120	197	269	13.23
Tamil Nadu	1.73	12,881	7,426	261	150	1415	816	37.01
Tripura	0.60	10,727	17,973	183	306	251	420	20.55
Uttar Pradesh	1.44	7,265	5,052	143	99	159	111	22.70
West Bengal	0.57	5,159	9,125	125	221	36	64	7.78
A & N Islands	0.43	7,408	17,073	192	442	1317	3035	37.26
Pondicherry	1.73	17,586	10,179	312	180	1587	918	31.74
Total	1.56	8,612	5,527	265	170	1125	722	38.13

6.4. Coverage of NIAS by Borrowing Status of Participants

As stated earlier, non-borrowers of institutional credit were kept out of crop insurance scheme. However, this lacuna was removed in the NIAS/RKBY and non-loanee farmers were also eligible to buy insurance cover for notified crops. It is observed that non-loanee farmers shared less than 10 per cent of the total farmers during 7 seasons (rabi 1999-2000 to 2002-03). The proportion of non-loanee farmers participating in crop insurance scheme was marginally

higher (9.00 per cent) during the rabi season when compared to the participation (8.42 per cent) during kharif season (Table 6.7). The sum insured by loanee farmers was to the tune of Rs. 272,539 million as against Rs. 18,753 million by non-loanee farmers. The claim premium ratios for non-loanee farmers were much higher during both kharif as well as rabi seasons.

Table 6.7 : Coverage of NIAS by Status of Borrowing (rabi 1999 to rabi 2002-2003)

(Percentages)

Seasons	Farmers Covered		Sum Insured		Claim/ Premium Ratio		Claim as % of Sum Insured	
	Loanee	Non-Loanee	Loanee	Non-Loanee	Loanee	Non-Loanee	Loanee	Non-Loanee
Kharif	91.58	8.42	93.29	6.71	4.1	8.16	13.69	27.17
Rabi	91.00	9.00	94.79	5.21	2.62	10.56	4.93	28.03
Total	91.46	8.54	93.56	6.44	3.93	8.45	12.08	27.30
(in million)	(30.93)	(2.89)	(272,539)	(18,753)	—	—	—	—

The overall claim premium ratio for loanee farmers was 3.93 as against 8.45 for non-loanee farmers. This indicates that the problem of adverse selection occured in the case of non-loanee farmers. In other words, non-loanee farmers, those who perceived higher risk opted for crop insurance cover. It is also observed that the loanee farmers claimed indemnities accounting for about 12 per cent of the sum insured whereas the indemnities claimed by non-loanee farmers accounted for more than 27 per cent of the sum insured by them. The average amount of sum insured as well as premium paid by non-loanee farmers was lower than those of loanee farmers during kharif and rabi seasons (Table 6.8). The average sum insured per loanee farmer was Rs. 8,810 when compared to Rs. 6,492 for non-loanee participant farmer.

Table 6.8 : Sum Insured, Premium Collected and Claims Paid Per Farmer

Season	Borrowing Status	Sum Insured (Rs)	Premium (Rs)	Claims (Rs)
Kharif	Loanee	9,036	302	1,237
	Non-Loanee	7,069	235	1,921
Rabi	Loanee	7,930	149	391
	Non-Loanee	4,406	117	1,235
Total	Loanee	8,810	271	1,064
	Non-Loanee	6,492	210	1,772

The amount of indemnity claimed was higher during both kharif as well as rabi seasons. The average amount of indemnity claimed by loanee and non-loanee farmers was Rs. 1,064 and Rs. 1,772, respectively.

6.5.   Claim/Premium and Claim/Sum Insured Ratio by Season

It can be seen from Table 6.9 that the overall claim premium ratio for Kharif season was 4.4 at the national level. However, there were wide variations in the claim premium ratio across the states. The average claim premium ratio for kharif season was less than one in the states/Uts of Assam (0.30), Jharkhand (0.76), West Bengal (0.06), Tripura (0.00), Sikkim (0.00), West Bengal (0.06), Pondicherry (0.0003) and A & N Island (0.78).

Table 6.9 : Claim/Premium and Claims/Sum Insured Ratios and Percentage of Farmers Receiving Indemnities (Rabi 1999 to rabi 2002-03)

State	Kharif			Rabi		
	Claim/ Premium Ratio	Claim as % of Sum Insured	% Farmers Benefited	Claim/ Premium Ratio	Claim as % of Sum Insured	% Farmers Benefited
Andhra Pradesh	2.15	6.04	20.08	1.47	2.62	14.52
Assam	0.30	0.64	9.79	0.63	1.68	13.33
Bihar	3.20	8.00	14.94	3.06	4.74	21.41
Chhattisgarh	8.21	21.63	58.85	1.44	2.66	6.61
Goa	1.10	1.86	24.20	0.17	0.25	6.98
Gujarat	7.39	29.28	93.11	2.91	6.54	34.76
Himachal Pradesh	6.99	17.13	97.51	4.23	7.46	9.81
Jharkhand	0.76	1.90	7.50	0.61	0.93	7.86
Karnataka	6.11	18.93	49.35	8.14	21.36	63.17
Kerala	5.68	14.15	33.50	0.63	1.23	6.56
Madhya Pradesh	4.08	16.73	45.62	5.14	8.91	36.87
Maharashtra	1.49	5.68	26.27	5.17	7.23	40.62
Meghalaya	2.33	6.45	15.12	0.65	6.04	19.85
Orissa	6.62	18.57	47.70	0.38	0.74	8.59
Sikkim	0.00	0.00	0.00	2.56	2.56	14.90
Tamil Nadu	2.02	4.89	35.50	6.20	12.11	37.25
Tripura	0.00	0.00	0.00	3.18	4.66	33.01
Uttar Pradesh	1.43	2.71	22.26	0.84	1.71	23.08
West Bengal	0.06	0.15	3.57	0.53	1.29	14.05
A & N Islands	0.78	1.76	15.56	6.88	17.80	37.29
Pondicherry	0.00	0.01	0.09	6.26	11.08	39.21
Total	4.37	14.60	40.69	3.19	6.13	28.26

On the contrary, remaining 14 States/UTs participating in NAIS had claim premium ratio of more than unity. The claim premium ratio for Kharif season in Chhatisgarh and Gujarat was more than 7. However, some of the states like Goa, Kerala, Meghalaya, Orissa Uttar Pradesh were partially successful in pooling the risk across seasons as indicated by loss (claim/premium) ratio, i.e., the loss ratio for kharif season was higher than unity indicating payment of indemnities whereas the loss ratio for rabi season was less than unity showing clearly that the amount collected as premium was higher than the claims paid during rabi season. It is also true that the seven States/UTs having claim premium ratio of less than unity were helping in paying indemnity claims in the states having claim premium ratio of more than unity. The loss cost ratio or claim /sum insured ratio for Kharif season ranged from zero in Sikkim, Tripura and Pondecherry (No claims) to more than 29 per cent in Gujarat. The total amount of indemnities paid accounted for little more than 4 per cent of the sum insured under NAIS. The number of farmers claiming indemnity payment for Kharif crops ranged from none in Sikkim, Tripura and Pondecherry to more than 90 per cent of the total farmers covered under NAIS during the Kharif season in Gujarat and Himachal Pradesh.

The overall claim premium ratio for Rabi season crops was lower (3.19) when compared with those of Kharif season crops (4.37). The association between claim premium ratios of Kharif and Rabi seasons was positive. Generally, The states having lower claim premium ratio during Kharif season had lower ratio for rabi crops too. However, Andaman & Nicobar Islands and Pondicherry had very high claim premium ratio (more than 6) during Rabi season as against less than one during Kharif season. The indemnities/claims paid during Rabi season accounted for 6 per cent of the total sum insured at the national level and it varied from less than one per cent of the sum insured in Goa, Jharkhand and Orissa to more than one fifth of the sum insured in Karnataka. The number of farmers claiming indemnity payment during rabi season ranged from less than 7 per cent of the participating farmers in Chhattisghar, Goa and Kerala to more than 40 per cent in Karnataka and Maharashtra. Scanty rains in the predominantly rabi growing areas of these states might have caused reduction in the yields and induced payment of indemnities.

6.6. Shortcomings of NAIS / RKBY

Though some of the shortcomings of the CCIS were addressed by enlarging the scope and coverage in terms of crops and farmers

covered under NIAS/RKBY, the Scheme could not make much dent and covered less than 10 per cent of the cropped area in the country. The premium rates being charged had no relation with actuarial rates. This is largely because actuarial rates, which reflect the probability of a loss, have not yet been computed. The scheme is not financially viable, as it depends on government for subsidization. The claim premium ratio is still very high. The question is posed that if disaster strikes how the government will manage the claims? Secondly, it is argued that the scheme is not a crop insurance scheme in reality but rather a crop loan insurance scheme. It aims to underwrite agricultural lending and not the agricultural risk. Third, though the area yield approach minimizes or eliminates the problem of moral hazards, another problem closely associated with insurance business, i.e., adverse selection seems to be affecting the existing NIAS/RKBY as indicated by higher claim premium ratio or loss ratio (claims paid as the percentage of sum insured) for non-loanee farmers. Fourth, there is inordinate delay in settling the claims in the event of crop failures or low yields. The farmer is hard pressed due to reduced or no access to institutional credit and faces liquidity crunch to begin new operation. Fifth, the government has not explored the avenues for reinsurance to absorb the shocks in case of widespread calamities and disasters.

6.7. Agriculture Insurance Company (AIC) of India Ltd.

The Union Finance Minister in his budget speech for 2002-02 proposed setting up a separate Corporation for Agriculture Insurance. A Task Force was constituted to oversee the setting up of the Agriculture Insurance Corporation. The Task force decided that the new company will be named as "Agriculture Insurance Company (GIC) of India Ltd and will be registered under the companies Act 1956. Accordingly, the Agricultural Insurance Company of India Ltd. came into being on December 20, 2002. The company has obtained registration from the Insurance Regulatory and Development Authority under the Insurance Act 1998. The General Insurance Corporation of India, National Bank for Agriculture and Rural Development (NABARD) and four public sector general insurance companies, viz., (i) National Insurance Co. Ltd, (ii) New India Insurance Co. Ltd, (iii) Oriental Insurance Co. Ltd. and (iv) United India Co. Ltd. are the promoters of the new agriculture insurance company. GIC of India Ltd. has subscribed 35 per cent and NABARD 30 per cent to the paid up capital while four public sector insurance companies have contributed 8.75 per cent each. The authorized capital of the new organization will be Rs. 1,500 crores,

while the initial paid-up capital is Rs. 200 crores. The Agriculture Insurance Company of India Ltd is implementing NIAS/RKBY without effecting any change in its content. However, the existing ad-hoc premium rates will be substituted by the actuarial rates in due course of time.

The government plans to shift to an actuarial regime soon. While this will push up premium rates, the approach will be more scientific. The government should subsidize a part of the premium to relieve farmers. A separate agency AIC of India, dedicated to agricultural insurance is expected to work on products suitable to Indian conditions and reduce the subsidy burden on the exchequer. Government support will be necessary, but comprehensive agriculture insurance will go a long way in protecting farmers from uncertainties. AIC of India will devise different insurance products suitable to Indian conditions and offer to farming community in the near future.

CHAPTER 7 :
CROP INSURANCE :
A CASE STUDY OF KARNATAKA

7.1. Introduction

The Comprehensive Crop Insurance Scheme, as recommended by the Government of India, is being implemented in Karnataka from Kharif 1985-86. All the farmers availing crop loan from cooperative credit institutions, Regional rural Banks and commercial banks for growing the selected (notified) crops are covered under the scheme. The State Government and the Union Government are partners in the Crop Insurance scheme being implemented in the country. The General Insurance Corporation of India administers the scheme.

The main objective of the scheme is to provide financial support to the farmers in the event of crop failure due to the vagaries of nature such as drought, flood etc., and to restore credit eligibility of farmers for the next cropping season. The scheme covers 11 major crops grown in the state. The crops covered under the scheme are rice, sorghum, ragi, pearl millet, maize, wheat, groundnut, sunflower, safflower, pigeonpea and chickpea.

7.1.1. State Crop Insurance Fund and Fund Committee

As stated earlier the central Government has set up a Central Insurance Fund. Similarly, the State Government has formed a separate Crop Insurance Fund with an initial corpus of Rs. 1 to 2 crores contributed equally by the Central and the State Governments. In Karnataka, the State Government has constituted a State Level Crop Insurance Fund Committee for implementing the CCIS and supervise the crop insurance fund. The Development Commissioner is the chairman and the Director of Agriculture acts as the Member Secretary of the Crop Insurance Fund committee. Secretaries from the line departments such as Cooperation, Agriculture, Finance are the members. Director, Directorate of Economics and Statistics (DES), Registrar of Cooperative Societies, represents the Ministry of Agriculture, and General Insurance Corporation (GIC) of India are also members of this Committee.

On the basis of the recommendation of the DES, the government notifies crops and talukas under CCIS soon after the commencement of the Agricultural year. The Director, DES who is one of the members is entrusted with the responsibilities of planning and

conducting crop cutting experiments on each crop in the taluks notified by the government. The DES has to furnish the results of crop cutting experiments to the GIC of India soon after the season as per the cut-off dates for settling the compensation claims.

The scheme used to be implemented by using resources from " State Crop Insurance Fund" generated by the state Government through matching contribution from the Government of India from time to time. However, the Government of India have stopped their contribution to the "State Fund" from 1987-88 onwards but are remitting their 2/3rd share towards claims and subsidy on premium directly to the General Insurance Corporation.

7.1.2. Crops covered

As stated earlier, 11 crops were covered under the CCIS in Karnataka State. The crops covered under CCIS are presented in Table 7.1. The crops covered under CCIS were Paddy, Sorghum, Ragi, Pearlmillet, Maize, Groundnut, Sunflower, and Pigeon pea, in Kharif, Paddy, Sorghum, Wheat, Chickpea, Sunflower and Safflower during rabi season and Paddy, Ragi and Groundnut during summer.

Table 7.1 : Crops Covered under CCIS in Karnataka

Kharif	Rabi	Summer
1. Paddy : Irrigated Rain-fed Non-classified	1. Paddy	1. Paddy
2. Sorghum	2. Sorghum	2. Ragi
3. Ragi	3. Chickpea	
4. Maize : Irrigated Rain-fed Non-classified	4. Wheat : Irrigated Rain-fed Non-classified	
5. Pearl millet	5. Safflower	
6. Pigeon pea		
7. Groundnut		3. Groundnut
8. Sunflower	6. Sunflower	

Paddy and maize grown under rain-fed and irrigated conditions during kharif were treated separately from 1993-94 crop season. Similarly, crop-cutting experiments were planned separately for wheat grown as rain-fed and irrigated crop from rabi 1994. Paddy was notified for crop insurance cover in almost all the districts in

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Karnataka State except in Bijapur district. The crop qualifies for notification if it is grown on more than 1,000 ha area in the state during the concerned season. Kharif paddy was notified in as many as 114 taluks followed by kharif groundnut in 105 taluks during 1994-95.

7.1.3. Coverage of CCIS in Karnataka

The total number of farmers participating in CCIS increased from 0.98 lakh in 1985 - 86 to more than 3 lakh in 1987-88 (Table 7.2). The Government of Karnataka could not implement CCIS during 1988 Kharif as the decision about continuation of the scheme was taken late. The CCIS covered 1.91 lakh ha in the first year of operation and reached 4.44 lakh ha during 1987. The number of farmers participating in CCIS and area insured fluctuated between 1989-90 and 1991-92. The number of farmers opting for crop insurance hovered around 3 lakhs and the area covered was around 5 lakh ha during latter half of 1990s. Loan waiver scheme announced by the government impinged on the coverage of CCIS during 1990-91 and the area covered and number of beneficiaries were the lowest during 1990-91.

Table 7.2 : Progress of Comprehensive Crop Insurance Scheme in Karnataka

(Figures in lakhs)

Years	Farmers	Area	Sum Insured	Pre-mium	Claims	Claim Premium Ratio	Loss Cost
1985-86	0.98	1.91	3,238.00	54.80	371.30	6.78	11.47
1986-87	2.01	3.39	5,514.4	93.7	324.7	3.47	5.89
1987-88	2.50	4.44	7,430.6	117.1	715.8	6.11	9.63
1988-89	0.00	0.00	0.0	0.0	0.0	0.00	0.00
1989-90	2.03	3.18	4,904.3	74.2	77.1	1.04	1.57
1990-91	0.41	0.78	1,245.5	20.7	31.8	1.54	2.55
1991-92	0.83	1.44	2,576.4	39.2	52.9	1.35	2.05
1992-93	1.94	3.45	6,270.4	94.7	534.2	5.64	8.52
1993-94	2.01	3.38	7,348.6	115.9	282.6	2.44	3.85
1994-95	2.28	4.04	9,278.2	137.6	108.9	0.79	1.17
1995-96	3.39	5.60	13,881.9	208.5	366.6	1.76	2.64
1996-97	3.00	5.07	15,030.6	223.3	466.3	2.09	3.10
1997-98	3.24	5.69	18,499.0	272.9	1,998.1	7.32	10.80
1998-99	2.74	4.89	17,455.1	270.5	411.0	1.52	2.35
1999-2000	3.01	5.58	20,528.7	309.5	958.6	3.10	4.67
ALL	30.37	52.86	133,201.7	2,032.6	6,699.9	3.30	5.03

Source: Compiled from the records of GIC of India ltd. Bangalore.

The claim premium ratio was more than unity for most of the year except in 1994-95 wherein claims paid accounted for Rs. 108.9 lakhs as against the premium of Rs. 137.6 lakhs. The total premium amount collected was Rs. 2,032.6 lakhs when compared to Rs.6,699.9 lakhs paid as indemnity claims during 1985 through 1999. The average claim premium ratio was lower (3.33) when compared with the all India average of more than 5 during 1985 through 1999. Rabi season shared 11 per cent and 7.4 per cent of the cumulative total number of farmers and area, respectively. Premium collected for rabi crops accounted for 9.56 per cent of the total premiums whereas indemnity claims paid for rabi crops were 5.5 per cent of the total indemnity payments made during 1985-86 through 1999 (Annex Tables 8 & 9). The mean loss cost (percentage of claims to sum insured) ratio was 5 per cent and it ranged from 1.17 per cent during 1994-95 to more than 10 per cent during 1985-86 and 1997-98.

7.1.4. Proportion of farmers and area covered

The number of farmers covered under CCIS varied across the crops. Most of the years, the proportion of farmers as well as area insured was the highest under paddy, followed by groundnut and sunflower (Tables 7.3 and 7.4; Figures 7.1 and 7.2). Sorghum and chickpea were the major crops covered under crop insurance during rabi season whereas paddy and groundnut were the only two crops insured during summer. The proportion of farmers and area under sunflower covered under CCIS peaked during 1992 and remained stable till 1998. The farmers growing groundnut shared 18 to 29 per cent of the total farmers and roughly equal proportion of the total insured area during 1985 through 1998. The farmers growing pigeon-pea accounted for more than ten per cent of the total farmers covered under CCIS only after mid 1990s.

The rising prices of pulses and incidentally, heavy losses suffered due to insect/pest damage might have induced the farmers to seek insurance for the pigeon-pea crop. The area insured under pearl millet, wheat, chickpea and safflower was negligible throughout the reference period of 1986 through 1998.

Table 7.3 : Proportion of Farmers Covered under CCIS by Crops

Year	1986	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Paddy	52.22	42.06	42.33	59.81	42.73	35.81	39.48	38.01	41.83	39.43	41.72	48.04
Sorghum	8.44	13.80	13.38	7.80	5.81	17.21	23.59	8.57	8.03	8.00	7.41	7.63
Pearl millet	0.67	0.59	0.57	0.25	0.23	0.25	0.18	0.20	0.14	0.19	0.10	0.10
Maize	0.93	2.01	1.89	1.90	4.35	4.35	1.91	2.01	1.57	2.46	1.59	2.44
Ragi	3.44	2.28	1.56	1.17	0.68	0.36	0.6	0.52	0.59	0.46	0.59	0.34
Pigeon pea	6.12	5.01	8.42	4.80	7.25	8.14	2.58	8.93	12.09	15.9	14.59	12.30
Ground-nut	19.88	25.76	26.98	18.90	29.25	22	19.98	23.13	22.66	22.21	21.65	17.93
Sun-flower	1.37	6.94	4.17	4.34	9.33	11.27	11.02	13.24	12.87	11.13	12.02	10.92
Wheat	6.54	0.85	0.14	0.16	0.06	0.34	0.1	0.02	0.02	0.01	0.01	0.04
Chick pea	0.38	0.06	0.42	0.63	0.21	0.22	0.21	5.27	0.14	0.18	0.22	0.25
Saff-lower	0.03	0.64	0.13	0.23	0.1	0.04	0.35	0.11	0.05	0.02	0.10	0.02
Total	100	100	100	100	100	100	100	100	100	100	100	100

Table 7.4 : Share of Major Crops in the Total Area Covered under CCIS by Years

Year	1986	1987	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Paddy	49.2	37.04	38.55	55.57	39.63	30.61	35.73	33.22	29.31	32.43	35.92	38.18
Sorghum	7.4	15.36	13.67	8.52	5.64	13.32	12.79	7.55	7.43	5.71	4.92	4.95
Pearl millet	0.59	0.47	0.58	0.27	0.27	0.29	0.17	0.17	0.15	0.18	0.1	0.09
Maize	0.89	1.62	1.76	1.78	3.9	2.88	1.52	1.8	1.6	2.23	1.79	3.12
Ragi	2.54	1.65	1.1	0.76	0.43	0.25	0.43	0.35	0.18	0.34	0.4	0.18
Pigeon pea	10.44	6.17	8.13	6.94	7.81	8.43	3.46	7.29	10.3	15.19	15.13	15.53
Ground-nut	23.99	25.85	29.37	19.26	27.65	25.49	26.63	28.34	31	28.22	27.62	22.42
Sun-flower	1.71	9.63	5.83	5.47	14.07	18.13	18.56	18.14	19.6	15.35	13.45	15.07
Wheat	2.71	0.99	0.18	0.13	0.13	0.3	0.07	0.02	0.04	0.01	0.01	0.04
Chick pea	0.49	0.05	0.67	0.84	0.32	0.25	0.26	2.96	0.23	0.31	0.36	0.38
Saf-flower	0.03	1.17	0.16	0.46	0.13	0.06	0.36	0.14	0.15	0.03	0.29	0.03
Total	100	100	100	100	100	100	100	100	100	100	100	100

Fig. 7.1

Percentage of Farmers Insured under CCIS by Major Crops

Fig. 7.2

Percentage of Area Insured under CCIS by Major Crops
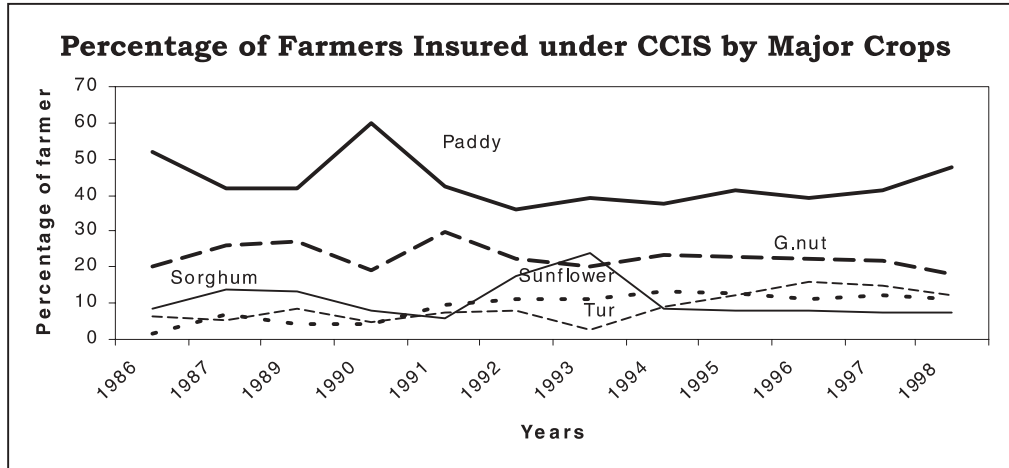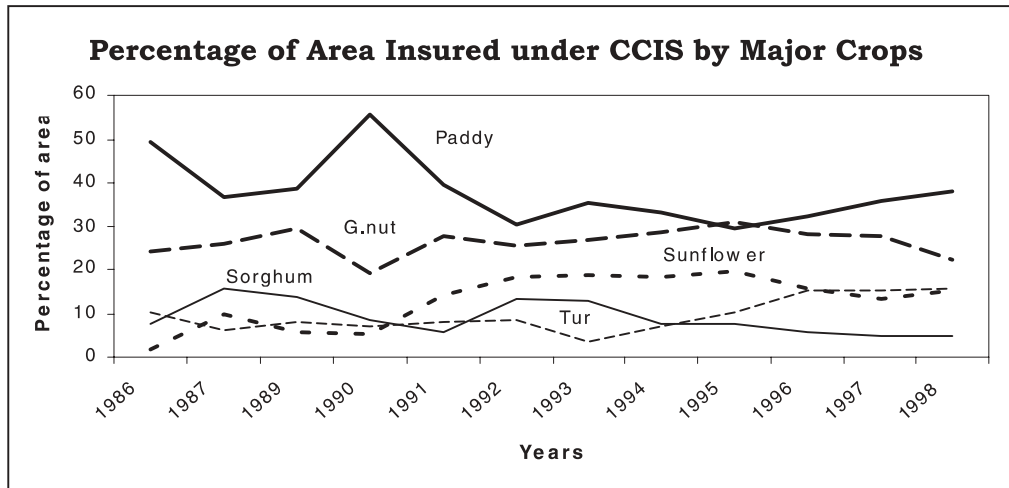
The small and marginal farmers accounted for little more than half of the total farmers covered under CCIS (Table 7.5). However, the proportion of small and marginal farmers participating in crop insurance varied over the years.

Table 7.5 : Distribution of Farmers Covered under CCIS by Farm Size Class

Year	Farm Size Groups		
	Small and Marginal	Medium and Large	Total Farmers
1985	52.17	47.83	100 (0.66)*
1986	37.23	62.77	100 (2.01)
1987	50.06	49.94	100 (2.47)
1988	0.00	0.00	0.00
1989	52.12	47.88	100 (2.05)
1990	53.53	46.47	100 (0.41)
1991	49.10	50.90	100 (0.84)
1992	49.82	50.18	100 (1.94)
1993	53.13	46.87	100 (2.01)
1994	51.10	48.90	100 (2.28)
1995	53.12	46.88	100 (3.39)
1996	53.47	46.53	100 (2.99)
1997	54.71	45.29	100 (3.25)
1998	56.90	43.10	100 (2.73)
1999	55.74	44.26	100 (3.01)
All	52.06	47.94	100 (30.01)

*   Figures in parenthesis are total number of farmers in lakhs

The small and marginal farmers shared 37 per cent of the total farmers during 1986 as against 57 per cent of the farmers covered under CCIS during 1998. The small and marginal farmers buying insurance cover out-numbered the medium and large farmers in most of the years except in 1986, 1991 and 1992 wherein the number of medium and large farm household opting for CCIS was marginally higher.

As such the spread and coverage of CCIS is very meager. In 1986, the total number of holdings covered under CCIS was 66 thousand accounting for 1.5 per cent of the 43.83 lakh total holdings in the state during 1985-85 (Table 7.6). The proportion of holdings covered under CCIS declined to 41.06 thousand in 1990-91 and accounted for just 0.71 per cent of the total 57.76 lakh holdings. However, in 1995-96, 3.38 lakh farmers were covered under CCIS, which accounted for 5.44 per cent of the total holdings in the state.

It is interesting to note that only 1.12 per cent or 34.42 thousand farmers from among 30.85 lakh small and marginal farmers and 31.54 thousand farmers (1.72 Per cent) from a total of 18.34 lakh medium and large farm categories opted for CCIS cover during 1985-86 crop year. Similarly, little more than half per cent (0.57) of the 38.48 lakh small and marginal farm households were covered under CCIS during 1990-91.

Table 7.6 : Coverage under CCIS by farm size groups during 1985/86 and 1990/91

Farm Size	Number of Holdings in '000'			Area in '000' Ha		
	1985-86	1990-91	1995-96	1985-86	1990-91	1995-96
Small & Marginal	34.42 (1.12)*	21.92 (0.57)	179.80 (4.16)	—	—	—
Medium & Large	31.54 (1.72)	19.13 (0.99)	158.71 (8.34)	—	—	—
ALL	65.96 1.34	41.06 (0.71)	338.51 (5.44)	211.00 (1.78)	79.00 (0.64)	560.00 (4.62)

* Figures in the parenthesis are percentages to total number of holdings and total area in ha in the respective category.

The position of medium and large farm group was not different from that of small and marginal farms and 19,133 or roughly one per cent of the 19.28 lakh medium and large farms were covered under CCIS during 1990-91. However, the farmers covered under CCIS steadily increased during 1995-96 where 4.16 per cent of the small and marginal farmers and little more than 8 per cent of the medium and large farms participated in the CCIS.

7.1.5 Beneficiaries

As stated earlier, indemnity claims are paid to the borrower households if the actual yield levels are below the average yield for the notified crop in the area. About 5.60 lakh or roughly 19 per cent of the total 30 lakh of the participating farmers in CCIS received compensation (Table 7.7). The number of farmers receiving compensation varied from 1.16 lakhs in 1997 to little more than 4 thousand during 1990. The average amount of indemnity claimed was Rs. 1,197 per beneficiary household and it ranged from Rs. 423 in 1989 to Rs.2,144 during 1992. The amount of compensation paid by the GIC was higher during kharif season as both number of farmers and area covered were higher during kharif season when compared to rabi and summer seasons.

Table 7.7 : Number of Farmers Who Received Compensation and Average Amount

Year	Kharif		Rabi		Summer		ALL	
	No. Farms	Rs/ Farm	No. Farms	Rs/ Farm	No. Farms	Rs/ Farm	No. Farms	Rs/ Farm
1985	19,759	1,587	1,763	1,690	2,678	1,103	24,200	1,541
1986	45,255	661	2,971	582	867	1,278	49,093	667
1987	77,417	899	1,975	387	1,541	731	80,933	883
1988	00	00	00	00	00	00	00	00
1989	14,406	505	3,486	67	329	584	18,221	423
1990	3,484	665	547	795	740	572	4,771	665
1991	7,393	599	236	453	634	1,194	8,263	641
1992	23,608	2,218	634	973	673	643	24,915	2,144
1993	18,374	1,488	254	311	779	1,082	19,407	1,456
1994	12,421	763	683	1,249	476	1,181	13,580	802
1995	47,567	747	343	1,434	1,071	697	48,981	751
1996	54,451	838	274	734	1,581	718	56,306	835
1997	108,516	1,709	3,070	2,159	4,021	1,612	115,607	1,718
1998	39,663	952	1,813	1,228	1,212	1,024	42,688	966
1999	52,765	1,825	—	—	—	—	—	1,825
Total	525,079	1,209	18,049	961	16,602	1,084	559,730	1,197

Note : Data for rabi and summer seasons for the 1999-2000 were not available.

7.1.6. Coverage of CCIS by Districts

The average number of farmers and area covered under CCIS during 1996 through 1998 for five major crops namely, paddy, sorghum, ragi, groundnut and sunflower were analyzed. The average area as well as number of farmers covered varied drastically across the districts (Table 7.8). The average number of farmers covered under CCIS per year ranged between 30 in Bangalore to 51,000 in Dharwad. There were, on an average, less than 5,000 participants in CCIS in 8 of the 19 districts in Karnataka. Similarly, roughly one fourth (five of the nineteen) of the districts in the state had less than five thousand ha of crop area under five major crops insured per year.

The average numbers of farmers covered under CCIS were higher (more than 15,000 per year) in districts like Bellary, Bidar, Bijapur, Raichur, Chiradurga, Dharwad, Gulbarga, Raichur, Shimoga and Uttar Kannada. Most of these districts, except Raichur and Shimoga, are dominated by rain-fed agriculture. The average amount of premium collected for five major crops during 1996 through 1998

was Rs. 21.52 million as against the claims paid to the tune of Rs. 67.71 million per year. The claim premium ratio ranged between 0.17 in Dakshin Kannada district and 8.36 for Dharwad district for the period of 1996 and 1998.

Table 7.8 : Average Number of Farmers and Area Covered under CCIS (1996-98)

District	Number of Farmers	Area in Ha	Premium Collected (Rs)	Claims Paid (Rs)	Claim/ Premium Ratio	# of Farmers Benefited	Area Benefited in Ha
Belgaum	2,127	3,227	139,628	491712	3.52	1481	2241
Bellary	15,236	29,575	1,652,570	3452246	2.09	2048	4197
Bangalore	30	34	2,359	636	0.27	1	1
Bijapur	20,971	65,045	1,117,111	4,235,363	3.79	3941	12812
Bidar	15,226	24,553	462,160	1,618,048	3.50	5073	7460
Chikmanglur	5,019	5,327	660,749	318,985	0.48	668	661
Chitradurga	15,244	33,221	2,076,876	725,997	0.35	1210	2812
Dharwad	51,324	81,808	3,955,028	33,067,472	8.36	16873	29353
Gulbarga	19,004	30,887	1,229,309	6,699,780	5.45	4830	8580
Hassan	666	801	84628	128,113	1.51	130	156
Kolar	4,546	7,049	309,141	1,111,263	3.59	1033	1784
Mandya	4,267	2,188	334,487	635,817	1.90	1386	675
Mysore	4,880	4,978	577,127	337,282	0.58	748	767
Raichur	20,160	42,187	2,343,022	4,575,248	1.95	4141	7486
Shimoga	23,207	25,098	2,555,042	1,643,406	0.64	4494	3927
Tumkur	4,100	9,611	324,774	550,184	1.69	318	552
Kodagu	10,870	21,596	1,643,304	504,409	0.31	1657	2579
U. Kannada	26,517	29,930	1,851,373	7,581,033	4.09	5820	6966
D. Kannada	2,162	2807	19,8561	33,220	0.17	116	179
State	245,557	419,925	21,517,248	67,706,612	3.16	55962	93181

The overall average claims premium ratio was 3.16 for the state as a whole. The average number of farmers benefited (received indemnities) varied from almost nil in Bangalore district to more than 16,000 in Dharwad district. The same was true in the case of area too.

7.1.7 : Share of Districts in the cropped area and area covered under CCIS

The proportionate area under the crop and the area covered under CCIS in the district were not in direct proportion. For example, the average area under paddy in Dakshin Kannada accounted for more than 10 per cent of the paddy area in the state

during triennium ending 1999. Its share was less than 2 per cent of the total paddy area covered under CCIS in the state (Table 7.9). On the contrary, Kodagu district shared roughly 3 per cent of the paddy area in the state but accounted for more than 12 per cent of the paddy area insured under CCIS. The same was true with Dharwad and Chitradurga districts wherein the area insured under paddy was disproportionately higher than its share in the total paddy area in the state.

Table 7.9 : Share of Districts in the Cropped Area and Area Covered under CCIS* (Average 1996-98)

District	% Share of the District in the Total Area under the Concerned Crop in the State				Percentage Share in the Area Covered under CCIS			
	Paddy	Sorghum	Ragi	G.nut	Paddy	Sorghum	Ragi	G.nut
Belgaum	4.68	10.21	0.24	7.12	1.61	0.23	0.00	0.14
Bellary	4.21	5.83	2.12	8.42	5.96	0.92	0.80	11.88
Bangalore	1.63	0.00	19.31	1.76	0.00	0.00	0.25	0.02
Bijapur	0.03	26.79	0.00	9.36	0.00	5.13	0.00	23.13
Bidar	0.71	5.87	0.00	0.43	0.09	36.21	0.00	0.71
Chikmaglur	3.74	0.84	5.76	0.67	2.60	0.12	10.75	0.23
Chitradurga	5.60	3.08	7.10	13.08	10.57	0.89	9.12	8.94
Dharwad	6.85	11.96	0.59	12.84	19.72	45.21	0.35	23.25
Gulbarga	0.89	18.74	0.01	10.23	0.14	9.20	0.00	10.89
Hassan	4.87	0.21	12.91	0.48	0.36	0.00	7.99	0.00
Kolar	2.07	0.00	10.73	8.09	0.13	0.00	0.62	4.98
Mandya	6.20	0.20	9.26	0.73	1.06	0.00	17.04	0.01
Mysore	9.23	2.26	10.51	3.23	2.41	0.16	0.73	0.38
Raichur	12.24	12.91	0.00	9.35	11.17	1.69	0.00	8.82
Shimoga	14.41	0.77	2.34	1.19	13.65	0.22	8.66	0.31
Tumkur	2.76	0.31	19.09	12.40	0.16	0.04	43.68	6.30
Kodagu	2.95	0.00	0.04	0.00	12.07	0.00	0.00	0.00
U. Kannada	6.54	0.01	0.01	0.35	16.73	0.00	0.00	0.00
D. Kannada	10.40	0.00	0.00	0.27	1.57	0.00	0.00	0.00
State	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

* Data on area under crops for newly created districts are not available. Hence, area under crops and area covered under CCIS have been presented for old districts.

In the case of sorghum, Bijapur district shared more than a quarter of the area under sorghum in the state. It accounted for little more than 5 per cent of the sorghum area covered under CCIS in the state. Bidar district shared less than 6 per cent of the sorghum area in the state but accounted for more than one third of sorghum area covered under CCIS. Bangalore and Tumkur districts each accounted for almost one fifth of the ragi area in the state but Bangalore shared less than half per cent of the insured area under ragi when compared to Tumkur sharing more than 40 per cent of the insured area under ragi in the state.

In the case of groundnut, Belgaum district shared 7 per cent of the groundnut area in the state but accounted for less than one per cent of the groundnut area covered under CCIS. On the contrary, Bijapur and Dharwad each shared more than 23 per cent of the groundnut area covered under CCIS in the state as against 9 and 13 per cent share in the total groundnut area in the state during 19996-98, respectively.

7.1.8. Farmers and area covered under CCIS by major crops

We have seen that the share of the district in the total area in the state under a particular crop and the proportion of area insured under CCIS of the reference crop were at variance. Similarly, the farmers had preference for insuring the crop and it varies across the districts in the state irrespective of the area covered in the district. It can be seen from Table 7.10 that among the five major crops considered here, farmers buying insurance cover for paddy accounted for more than half of the total farmers covered under CCIS, followed by groundnut (25 per cent) and sunflower (14 per cent) and ragi (0.6 per cent).

Table 7.10 : Proportion of Farmers under Major Crops Covered under CCIS in the Districts (Triennium Average 1996-98)

Districts	Percentage of the total farmers covered under 5 major crops					
	Paddy	Jowar	Ragi	Ground-nut	Sun-flower	All (Tot. HH)
Belgaum	92.23	1.41	0.00	4.47	1.90	100 (2127)
Bellary	37.04	1.01	0.04	55.25	6.66	100 (15236)
Bangalore	3.37	0.00	15.73	80.90	0.00	100 (30)
Bijapur	0.00	1.77	0.00	51.48	46.74	100 (20971)
Bidar	1.05	37.45	0.00	4.30	57.20	100 (15226)
Chikmaglur	89.41	0.60	3.87	3.33	2.79	100 (5019)
Chitradurga	62.36	0.72	0.57	32.86	3.49	100 (15244)
Dharwad	42.61	29.78	0.02	25.23	2.37	100 (51324)
Gulbarga	0.66	5.16	0.00	49.28	44.90	100 (19004)
Hassan	79.38	0.00	16.47	0.00	4.15	100 (666)
Kolar	3.29	0.00	0.17	96.54	0.00	100 (4546)
Mandya	91.73	0.00	7.40	0.87	0.00	100 (4267)
Mysore	89.38	0.82	0.20	8.24	1.36	100 (4880)
Raichur	50.77	0.92	0.00	28.84	19.47	100 (20160)
Shimoga	96.71	0.31	0.72	2.05	0.21	100 (23207)
Tumkur	6.06	0.18	11.88	81.88	0.00	100 (4100)
Kodagu	100.00	0.00	0.00	0.00	0.00	100 (10870)
U. Kannada	100.00	0.00	0.00	0.00	0.00	100 (26517)
D. Kannada	100.00	0.00	0.00	0.00	0.00	100 (2162)
State	50.98	9.35	0.57	25.23	13.87	100 (2455567)

Source: Compiled from various records available at GIC of India Ltd., Bangalore

In terms of area, paddy shared 43 per cent of the total crop area insured under five major crops when compared with 33 per cent by groundnut, 18 per cent by sunflower and less than half per cent by ragi (Table 7.11). Paddy was notified for crop insurance in most of the districts except Bijapur and hence the proportion of farmers as well as area insured under paddy was the highest among five crops considered in the study. Similarly, groundnut is an important cash crop of Karnataka and crop insurance facility was available for groundnut in all the districts in the state.

Table 7.11 : Proportion of Area under Major Crops Covered under CCIS in the Districts (Triennium Average 1996-98)

Districts	Percentage of the total area covered under 5 major crops					
	Paddy	Jowar	Ragi	Ground-nut	Sun-flower	Total Area (Ha)
Belgaum	89.17	1.91	0.00	5.95	2.96	100 (3227)
Bellary	36.06	0.84	0.04	54.86	8.20	100 (29575)
Bangalore	1.96	0.00	12.04	85.99	0.00	100 (34)
Bijapur	0.00	2.13	0.00	48.55	49.31	100 (65045)
Bidar	0.63	39.85	0.00	3.93	55.60	100 (24553)
Chikmaglur	87.23	0.59	3.31	5.81	3.07	100 (5327)
Chitradurga	56.91	0.72	0.45	36.74	5.18	100 (33221)
Dharwad	43.12	14.93	0.01	38.81	3.13	100 (81808)
Gulbarga	0.84	8.05	0.00	48.15	42.96	100 (30887)
Hassan	79.99	0.00	16.35	0.00	3.66	100 (801)
Kolar	3.38	0.00	0.14	96.48	0.00	100 (7049)
Mandya	86.55	0.00	12.76	0.68	0.00	100 (2188)
Mysore	86.70	0.86	0.24	10.40	1.80	100 (4978)
Raichur	47.35	1.08	0.00	28.56	23.01	100 (42187)
Shimoga	97.32	0.24	0.57	1.67	0.21	100 25098
Tumkur	2.91	0.11	7.45	89.53	0.00	100 (9611)
Kodagu	100.00	0.00	0.00	0.00	0.00	100 (21596)
U. Kannada	100.00	0.00	0.00	0.00	0.00	100 (29930)
D. Kannada	100.00	0.00	0.00	0.00	0.00	100 (2807)
State	42.60	6.44	0.39	32.51	18.06	100 (419925)

The proportion of farmers opting for crop insurance and crop area insured under CCIS varies across districts. About ninety or more than 90 per cent of the total farmers (covering 5 crops) from Belgum, Chickmaglur, Mandya, Mysore, Shimoga, Kodagu and Dakshina and Uttara Kannada had insured paddy and area covered was positively associated with the number of farmers. Demand for insurance of sorghum crop was observed in Bidar, Dharwad and Gulbarga districts only and as many as 37, 30 and 5 per cent of the participating farmers from the respective districts bought

insurance cover for sorghum. The sorghum area covered under CCIS was around 40 per cent of the total area insured under CCIS in Bidar district, 15 per cent in Dharwad and little more than 8 per cent of the total insured area (five crops only) in Gulbarga district.

Bangalore and Hassan, were the major districts where more than 15 per cent of the farmers opted for insurance of ragi crop. In Mandya, 7.4 per cent of the participant farmers insured ragi crop and the area covered accounted for roughly 13 per cent of the insured area under five major crops in the district. Ragi growers in Tumkur accounted for 12 per cent of the participants and area insured under ragi was 7.5 per cent of the total area covered under five major crops.

Groundnut is the most important cash crop of Karnataka and groundnut growers from Bangalore, Kolar and Tumkur accounted for more than 80 per cent of the total farmers opting for insurance (5 crops taken together). Area insured under groundnut also accounted for more than 80 per cent of the total area (5 crops) covered under CCIS. Sunflower is another important crop in rain-fed areas of Karnataka. The proportion of farmers insuring sunflower was more than 40 per cent in Bijapur, Bidar, and Gulburga districts. The same was true for the area under sunflower.

7.1.9. Number of farmers and area benefited (claims received)

The number of farmers (growing five major crops paddy, ragi, sorghum, groundnut and sunflower) benefited or received indemnities during 1996 through 1998 accounted for 22.79 per cent of the total farmers covered under CCIS and the area benefited was 22.52 per cent of the total area insured (Table 7.12). The proportion of area as well as the farmers who received indemnities was the least in Bangalore district, i.e., 1.12 per cent of the total number of farmers and 2.2 per cent of the area covered under CCIS (under five major crops) in district. The failure of rain-fed paddy during 1997-98 and 1998-99 in Belgaum district resulted in the highest proportion of farmers as well as area (more than 69 per cent) benefiting through indemnity payments.

It is observed that as much as 70 per cent of the total area insured (under five major crops) in Belgaum district received indemnity payments. Bidar, Dharwad and Mandya were the other three districts, which received indemnity payments for more than 30 per cent of the insured area during 1996-98. The average amount of

indemnity received per ha as well as per beneficiary farmer was the highest in Dharwad district and the lowest in Dakshin Kannada.

The average ratio of claims paid and premium collected during the triennium ending with 1998 was highest (7.41) for groundnut indicating that districts having higher proportion of farmers/area under groundnut were the major beneficiaries of compensation. Average claim premium ratio varied across crops and districts. The claim premium ratio for paddy was higher than unity in 9 of the 19 districts in the state and the indemnity payments for paddy in Kolar were 13 times higher than the premium collected during 1996-98. Average claim premium ratio for sorghum in the state was more than unity in only two districts, namely, Gulbarga (8.22) and Raichur (2.04). Similarly, in case of ragi, compensation was paid only in Chitradurga district and the claims paid were 75 per cent higher than the premium collected for ragi crop in the district (Annex Table 10).

Table 7.12 : Percentage of Farmers and Area benefited (5 major crops) by Districts (Average 1996-98)

District	Percentage Farmers Benefited	Percentage Area Benefited	Claim/ Beneficiary (Rs)	Claim/ Ha (Rs)	Sum Insured/ Farmer (Rs)	Sum Insured/ Ha (Rs)
Belgaum	69.64	69.42	332	219	3,535	2,329
Bellary	13.44	14.19	1,686	822	7,713	3,973
Bangalore	1.12	2.21	1,909	848	7,045	6,154
Bijapur	18.79	19.70	1,075	331	5,254	1,694
Bidar	33.32	30.38	319	217	2,286	1,418
Chikmaglur	13.30	12.40	478	483	6,779	6,386
Chitradurga	7.94	8.47	600	258	8,248	3,785
Dharwad	32.87	35.88	1,960	1127	4,732	2,969
Gulbarga	25.41	27.78	1,387	781	6,140	3,778
Hassan	19.47	19.53	988	819	5,196	4,321
Kolar	22.71	25.30	1,076	623	6,556	4,228
Mandya	32.49	30.86	459	942	3,931	7,666
Mysore	15.33	15.41	451	440	6,151	6,030
Raichur	20.54	17.75	1,105	611	7,566	3,615
Shimoga	19.36	15.65	366	418	5,565	5,146
Tumkur	7.76	5.74	1,730	996	7,032	3,000
Kodagu	15.25	11.94	304	196	7,559	3,805
U. Kannada	21.95	23.28	1,303	1088	3,491	3,093
D. Kannada	5.37	6.39	286	185	4,592	3,,536
State	22.79	22.52	1,210	727	5,508	3,268

The claim premium ratio was higher for cash crops (groundnut and sunflower) when compared to food crops. The claims paid towards failure of groundnut crop were more than 7 times higher than the premium collected for groundnut. Nine districts had a claim premium ratio exceeding unity and the highest ratio (20.2) was for Dharwad district. The average claims premium ratio for sunflower was 4.67 and the indemnity payments were paid in 9 districts (Annex Table 10). The claims paid for sunflower in Bellary district were roughly 15 times higher than the premium collected.

The average sum insured ranged between Rs. 2,485 per beneficiary (borrower) farmer in Bidar district and Rs. 8,883 in Bangalore whereas it ranged from less than Rs.2,000 per ha in Bijapur, Bidar and Koppal to more than Rs. 6,000 per ha in the districts of Chickmaglur, Mandya and Mysore. The average indemnity claim received during 1996-98 was Rs. 1,427 per beneficiary farmer (Rs. 798 per ha). However, there were large variations in the average amount of indemnity claims (per beneficiary farmer as well as per hectare) across the districts. For example, the average indemnity claim ranged from Rs. 145 per beneficiary farmer (Rs. 68 per ha) in Udupi to Rs. 4,455 per farmer (Rs. 1,649 per ha) in Davangere district.

The claims received, on an average, ranged between 19 per cent and 34 per cent of the sum insured by the beneficiaries for sunflower and groundnut crops, respectively (Table 7.13). There were large variations across the districts for the claims paid as a proportion of sum insured. The beneficiary farmers from Dharwad received nearly 50 per cent of the sum insured for paddy as indemnity payments when compared to just less than 3 per cent of the sum insured by the farmers in Chitradurga. On the contrary, the average claims received by sorghum and ragi growers from Chitradurga accounted for 89 per cent and 44 per cent of the of the sum insured for the respective crops in that order. Average indemnity payments (1996-98) for groundnut and sunflower accounted for as high as 64 per cent and 54 per cent of the sum insured by the beneficiary households in Dharwad and Bellary districts, respectively.

Table 7.13 : Claims Paid as Percentage of Sum Insured by the Beneficiaries

District	Paddy	Sorghum	Ragi	G.nut	Sunflower
Belgaum	8.99	0.00	0.00	12.23	20.17
Bellary	5.06	22.26	0.00	30.13	54.45
Bangalore	0.00	0.00	0.00	19.09	0.00
Bijapur	0.00	31.09	0.00	22.49	14.81
Bidar	36.69	16.88	0.00	18.84	13.11
Chikmaglur	6.93	0.00	0.00	0.00	0.00
Chitradurga	2.61	89.39	43.85	9.20	21.84
Dharwad	47.01	6.39	0.00	64.68	23.55
Gulbarga	19.97	37.28	0.00	18.35	20.12
Hassan	16.50	0.00	1.98	0.00	15.97
Kolar	32.05	0.00	6.78	12.70	0.00
Mandya	11.65	0.00	0.00	0.00	0.00
Mysore	6.63	0.00	0.00	0.00	0.00
Raichur	11.08	27.18	0.00	17.52	20.87
Shimoga	6.85	0.00	22.27	24.67	0.00
Tumkur	14.88	48.83	33.47	26.51	0.00
Kodagu	4.66	0.00	0.00	0.00	0.00
U. Kannada	30.10	0.00	0.00	0.00	0.00
D. Kannada	5.01	0.00	0.00	0.00	0.00
State	20.90	25.33	22.96	33.88	19.06

7.1.10. Variability in yields and indemnity claims

Yield levels of various crops fluctuate from year to year due to number of factors. The variations in the yields differ over time and space. Coefficient of variation (CV) of yield is considered as an indicator of variability or risk in yields in the present exercise. The CV for yield levels of five major crops has been estimated and presented in Table 7.14. The variability in sorghum yields ranged from 14 per cent in Belgum district to 35 per cent in Uttar Kannada district. Ragi yields varied from less than one per cent in Belgum to 24 per cent in Mandya district during 1990-91 through 1997-98.

Rice yields were stable (CV less than 5 per cent) in Chickmaglur and Dakshin Kannada and relatively unstable in Bidar (CV 39 per cent), Dharwad (CV 25 per cent) and Gulbarga district (CV 32%). Variability in groundnut productivity/yield was more conspicuous in most of the districts. The coefficient of variation for groundnut was higher than 10 per cent in most of the districts except Mysore and

Raichur and it was more than 30 per cent in the districts of Bidar, Gulbarga, Mandya and Uttar Kannada. Fluctuations in the sunflower yield were comparable with that of groundnut and the CV ranged from a minimum of 8 per cent in Belgum and Chitradurga districts to more than 50 per cent in Mysore district.

Table 7.14 : Variability (Coefficient of Variation) in Yields of Major Crops by Districts

DIST	Sorghum	Ragi	Rice	G.nut	Sunflower
	1990-98	1990-98	1990-98	1990-94	1990-94
Bangalore	NA	18.55	10.46	21.47	12.14
Belgaum	14.49	0.35	15.90	10.32	8.41
Bellary	18.88	9.57	7.03	10.19	19.91
Bidar	18.84	NA	38.92	36.18	13.23
Bijapur	20.25	NA	18.52	18.81	18.49
Chikmaglur	23.09	4.15	5.02	23.41	38.25
Chitradurga	22.36	4.46	7.68	25.90	8.36
Dakshin Kannada	NA	NA	3.19	11.00	NA
Dharwad	21.58	10.18	25.25	22.95	22.01
Gulbarga	30.75	10.40	32.26	30.83	16.85
Hassan	26.72	11.05	8.96	28.24	16.79
Kodagu	NA	11.33	5.75	11.51	NA
Kolar	NA	14.39	15.41	25.61	9.50
Mandya	33.97	24.24	6.12	31.36	36.17
Mysore	25.06	15.83	6.19	3.93	51.96
Raichur	17.75	NA	5.98	7.16	36.02
Shimoga	15.44	3.08	5.84	23.32	13.79
Tumkur	24.15	3.00	15.56	16.59	13.77
Uttara Kannada	34.66	4.86	6.86	39.31	16.53
State	17.85	12.07	5.10	14.94	12.43

7.1.11. Determinants of area coverage and indemnity payments

It is expected that the proportion of farmers receiving indemnity payments will be higher in the districts experiencing larger variation in yield levels. The proportion of households and area benefited with indemnity payments indicated positive association with coefficient of variation in case of paddy, sorghum and groundnut (Table 7.15). On the contrary, the proportionate area and households claiming indemnity payments for ragi and sunflower were negatively correlated with the CV of the respective crops.

Table 7.15 : Correlation between Farmers,
Area Benefited and CV of Major Crops

Crops	Variables	% Area Benefited	% Farmers Benefited	Coefficient of Variation
Paddy	Area	1.00	0.987**	0.134
	Farmers		1.00	0.089
	CV			1.00
Sorghum	Area	1.00	0.934**	0.451
	Farmers		1.00	0.295
	CV			1.00
Ragi	Area	1.00	0.999**	-0.452
	Farmers		1.00	-0.439
	CV			1.00
Groundnut	Area	1.00	0.977**	0.006
	Farmers		1.00	0.042
	CV			1.00
Sunflower	Area	1.00	0.981**	-0.531
	Farmers		1.00	-0.506
	CV			1.00

Linear regressions were worked out to study the determinants of area coverage and claims paid. In case of paddy, THE area under paddy had significant bearing on the extent of area insured. however, districts with higher proportion of area under irrigation tended to have less insurance coverage (Table 7.16). Area insured under paddy and variability in paddy yields in the districts influenced the indemnity payments in the district.

In case of sorghum, availability of irrigation was the major factor impinging upon the extent of area covered under irrigation, and higher the proportion of irrigated area lesser was the area insured under sorghum. Surprisingly, the district with higher variability in yields had less insurance coverage (though statistically not significant). Indemnity payments were positively associated with area under crop, variability in yields and area insured but none of the coefficient was statistically significant. Similarly, indemnity payments for crop failure were influenced significantly by the yield variability in sorghum.

Area and variability in ragi yields were major factors influencing the area coverage under insurance. The area under ragi contributed

significantly to THE area insured. Contrary to our expectation, variability in yield had negative impact (statistically significant) on the area insured under ragi. The area benefited and claims paid were determined by the extent of area insured.

Table 7.16 : Determinants of Area Coverage and Indemnity Payment

Crop	Dependent Variable	Independent variables					$\overline{R}^2$
		Constant	Area under Crop	Percen-tage Irrigated Area	Variabi-lity in Yield (CV)	Area Insured	
Paddy	Area insured	8.223 (1.083)*	188.058 (3.293)	-0.619 (2.294)	26.775 (0.099)	—	0.346
	Area benefited	-3.317 (1.638)	-4.869 (0.252)	0.048 (0.595)	143.368 (2.051)	0.328 (4.935)	0.669
	Claims paid	-2866.09 (1.433)	-7849.39 (0.411)	39.812 (0.498)	123037.4 (1.782)	273.794 (4.165)	0.569
Jowar	Area insured	18.40 (1.979)	2.756 (0.383)	-0.334 (2.270)	-0.476 (1.438)	—	0.194
	Area benefited	-0.636 (0.746)	0.467 (0.855)	-0.0002 (0.016)	0.0312 (1.119)	0.0425 (1.602)	0.320
	Claims paid	-1040.36 (1.659)	541.338 (1.348)	6.159 (0.590)	42.889 (2.089)	13.946 (0.714)	0.328
Ragi	Area insured	-0.0009 (0.005)	2.268 (2.303)	0.0066 (1.139)	-0.0180 (2.038)	—	0.290
	Area benefited	0.0022 (0.292)	0.102 (1.713)	0.00003 (0.115)	-0.0009 (1.693)	0.0386 (2.244)	0.725
	Claims paid	2.435 (0.457)	50.201 (1.212)	-0.0295 (0.146)	-0.598 (1.69)	37.948 (3.165)	0.787
Ground-nut	Area insured	-1.605 (0.179)	137.08 (3.623)	-0.095 (0.466)	0.0887 (0.397)	—	0.488
	Area benefited	0.201 (0.15)	-19.827 (2.357)	0.0006 (0.020)	-0.0005 (0.013)	0.388 (8.564)	0.891
	Claims paid	-238.533 (0.060)	-22097.9 (0.884)	-12.065 (0.131)	15.532 (0.155)	442.03 (3.28)	0.502

* Figures in the parenthesis are t values.

In case of groundnut, area under the crop was found to be a most important variable influencing the groundnut area covered under insurance. The district having less area under groundnut benefited more through indemnity payments. On the other hand, area insured had a significant bearing on indemnity claims paid and also area benefited by indemnity payments.

7.1.12. Financial viability of CCIS

The balance between expenditure and the revenue earned determines the viability as well as sustainability of any developmental programme. The cost of insurance has two components: cost of risk (indemnities) and the administration cost. The administrative costs may remain relatively constant over time but indemnity cost may vary over time. The administrative costs include handling, processing and retrieving information as well as expenditure on field staff. The experience of CCIS in Karnataka is not different when compared with the results at aggregate or national level. Karnataka participated in the implementation of CCIS right from 1985-86 through 1999 except in 1988-89 due to delayed decision by the central government about the continuance of the scheme. In Karnataka, little more than 3 million farmers opted for crop insurance covering 5.29 million ha of cropped area during 1985 through 1999. The total indemnity payments were to the tune of Rs. 699.99 million as against the premium of Rs. 203.25 million. The proportion of farmers, area insured as well as premium collected and claims made for kharif crops accounted for more than 90 per cent of the total farmers, area insured as well as premium collected and claims paid during the year. Premium collected during kharif season was Rs. 183.82 million whereas claims paid were to the tune of Rs. 633.09 million (Table 7.17). Similarly, in rabi season, a total of Rs. 36.9 million were paid as claims as against a premium of Rs. 19.43 million.

Table 7.17 : Premium and Claims by Season

Year	Kharif Season				Rabi Season			
	Premium (Rs lakh)	Claim (Rs lakh)	Claim Premium Ratio	Loss cost (%)	Premium (Rs lakh)	Claim (Rs lakh)	Claim Premium Ratio	Loss cost (%)
1985	46.00	312.00	6.78	11.62	8.80	59.30	6.74	10.70
1986	86.50	296.40	3.43	5.85	7.20	28.30	3.93	6.36
1987	110.50	696.90	6.31	10.03	6.60	18.90	2.86	3.91
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1989	70.40	72.80	1.03	1.55	3.80	4.30	1.13	1.98
1990	17.70	23.20	1.31	2.19	3.00	8.60	2.87	4.57
1991	35.30	44.30	1.25	1.92	3.90	8.60	2.21	3.21
1992	80.70	523.70	6.49	9.56	13.90	10.50	0.76	1.32
1993	93.10	273.40	2.94	4.52	22.80	9.20	0.40	0.71
1994	118.60	94.70	0.80	1.18	19.00	14.20	0.75	1.13
1995	185.90	354.20	1.91	2.82	22.60	12.40	0.55	0.92
1996	197.90	452.90	2.29	3.35	25.40	13.40	0.53	0.89
1997	245.00	1851.50	7.56	11.00	27.90	146.60	5.25	8.82
1998	241.10	376.30	1.56	2.39	29.40	34.70	1.18	1.99
1999	309.50	958.60	3.10	4.67	0.00	0.00	0.00	0.00
All	1,838.20	6,330.90	3.44	5.21	194.30	369.00	1.90	3.14

The overall claim premium ratio works out to 3.3 (3.44 and 1.90 for kharif and rabi seasons, respectively). The indemnity payments accounted for 5.21 per cent and 3.14 per cent of the sum insured during kharif and rabi seasons, respectively. The amount collected as premium was higher than the indemnity payments during both kharif as well as rabi season only during 1994-95 crop year. The overall indemnity or claims paid accounted for 5.03 per cent of the total cumulative sum insured between 1985 and 1999. Thus, CCIS seems to be loss making exercise considering the claim premium ratio over the period of one half decade. However, the claim premium ratio as well as loss cost percentage (indemnity payment as the percentage of sum insured) were relatively low when compared to the national average.

Thus, the foregoing analysis suggests that the premium needed to cover only indemnity payments of crop insurance at the national level should be 5 to 6 times higher than the existing rate and more than 3 times in Karnataka State. The current rate of premium ranges from 1.5 per cent of the loan amount for wheat to 3.5 per cent for pearl millet and oilseeds. The actual premium (without government subsidy) needed to cover the indemnity payments and administrative costs will be much higher when compared to the cost of non-agricultural insurance. It is so high that farmers might be reluctant to participate in the insurance programme.

7.2. National Agriculture Insurance Scheme (NAIS) or Rashtriya Krishi Bima Yojana (RKBY) in Karnataka

7.2.1. Number of farmers and area covered under NAIS

NAIS was introduced in the state of Karnataka during rabi 2000. As in the case of CCIS, NAIS is mandatory for all the farmers who avail crop credit from the formal institutions such as cooperative banks, regional rural banks and commercial banks. It is optional for non-loanee farmers. The number of farmers covered under NAIS increased steadily from 0.37 million in 2000-2001 to more than a million in 2002-2003 (Table 7.18). Similarly, area insured increased to 1.5 million in 2003 as against 0.7 million during 2000-01.

Both the area covered and sum insured during kharif accounted for roughly 90 per cent of the total area and sum insured. Karnataka shared little more than 6 per cent of the area and number of farmers in the total area and farmers covered under NAIS in the country during the reference period of 2000 through 2003.

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However, the sum insured in the state accounted for more than 7 per cent of the respective totals at the national level. Sum insured under NIAS increased from 14 per cent of the crop loan disbursed in 2000-01 to 37 per cent during 2002-03.

Table 7.18 : Number of Farmers and Area Covered under NAIS in Karnataka

(in millions)

Year/Season	Farmers Covered	Area Covered (Ha)	Sum insured	Crop loan Disbursed	% of loan Insured
Kharif					
2000-01	0.327	0.614	3,467.52	—	—
2001-02	0.611	0.889	5,163.88	—	—
2002-03	0.874	1.319	11,616.51	—	—
Total Kharif	1.812	2.822	20,247.91	—	—
Rabi					
2000-01	0.041	0.073	459.89	—	—
2001-02	0.066	0.102	617.15	—	—
2002-03	0.141	0.210	1,027.91	—	—
Total Kharif	0.248	0.384	2,104.95	—	—
Kharif + Rabi					
2000-01	0.367	0.686	3,927.40	27,842.73	14.11
2001-02	0.677	0.991	5,781.03	32,004.11	18.06
2002-03	1.015	1.529	12,644.42	34,153.80*	37.02
All	**2.059**	**3.206**	**22,352.86**	94,000.64	23.78

* Target for 2003 (NABARD 2002)

7.2.2. Coverage of NIAS across Districts

It can be seen from Table 7.19 that the proportion of farmers participating in NIAS was relatively high from northern region when compared with other regions of the state. The total number of holdings in the northern dry region accounted for 42.4 per cent of the holdings in the state (GoK 1999) whereas the number of farmers seeking crop insurance shared 65.8 per cent of the total farmers covered under NAIS in the state during 2002-03. In terms of area, northern region shared 64.5 per cent of the cropped area but accounted for nearly 72 per cent of the insured area in the state. The higher proportion of farmers buying crop insurance is conditioned by the dominance of notified crops such as cereals and

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millets, pulses and oilseeds in the cropping pattern of the area. Secondly, farmers may also be interested in seeking insurance due to frequent droughts and crop failures experienced by the farmers in the region.

Table 7.19 : Percentage Share of District in the Total Holdings and Farmers Covered under NAIS in Karnataka During 2002-03

District	% of Total Farmers in the State		% of Total Area in the State	
	Total	Insured	Total	Insured
Bijapur	7.09	8.48	12.24	11.53
Belgaum	6.97	11.07	9.02	9.77
Bellary	4.09	0.96	5.03	1.43
Bidar	3.14	12.14	3.95	11.00
Dharwad	6.55	20.52	12.02	21.79
Gulbarga	7.71	8.58	12.66	11.17
Raichur	6.85	4.09	9.58	5.11
Northern zone	**42.39**	**65.83**	**64.50**	**71.80**
Bangalore	5.60	0.10	2.93	0.06
Chiradurga	5.20	4.16	8.31	5.92
Kolar	5.43	1.55	2.25	1.09
Tumkur	6.59	2.14	4.73	3.20
Central Zone	**22.81**	**7.95**	**18.21**	**10.27**
Hassan	5.88	8.94	2.84	5.29
Mandhya	7.02	0.46	2.24	0.26
Mysore	7.38	5.17	5.59	3.55
Southern zone	**20.27**	**14.56**	**10.67**	**9.10**
Chickmaglur	2.68	1.78	1.62	1.16
D.Kannada	4.70	0.16	1.53	0.11
Kodagu	0.95	0.76	0.39	0.93
Shimoga	3.82	5.27	2.09	3.66
U.Kannada	2.38	3.67	1.00	2.97
Hills & coastal zone	**14.53**	**11.66**	**6.63**	**8.83**
State (holdings in lakhs)	100.00 (62.21)	100.00 (10.13)	100.00 (110.37)	100.00 (15.29)

On the contrary, the number of farmers participating in NAIS from central zone accounted for 7.95 per cent of the farmers (10.27

per cent of the area in the state whereas central region shared 23 per cent of the total holdings and 18 per cent of the cropped area in the state. The proportion of farmers as well as area covered under NAIS was relatively low in the districts of Bangalore, Mandya, and Dakshin Kannada than their share in the total holdings and area in the state. This may be partly due to proportionately large area under horticultural and plantation crops, which are not covered under NAIS and this might have resulted in the lower proportion of insured area in Bangalore and Dakshin Kannada districts. Similarly, higher proportion of irrigated area in Mandya might have led to disinclination towards buying crop insurance cover by the farmers. Coverage of NAIS was very sparse in southern as well as hills and coastal regions. The number of farmers opting for insurance and area covered was roughly 50 and 70 per cent of respective shares in total holdings and area in the state.

7.2.3. Farmers and area covered under NAIS during 2002-03 by districts

The number of farmers participating in the NAIS accounted for 16.29 per cent of the total 62.21 lakh farmers and the area covered was less than 15 (13.6) per cent of the 110.37 lakh ha of cropped area in the state during 2002-03 (Table 7.20). As stated earlier, the proportion of farmers opting for crop insurance was relatively high (25 per cent of the total 26.37 lakh farms in the region) when compared to the farmers from other regions of the state. However, only 15 per cent of the 71.19 lakh ha of cropped area was insured. Participation in NAIS was fairly better in the hills and coastal region (next to northern region) wherein 13 per cent of the 9 lakh farmers bought insurance covering 18 per cent of the 7.31 lakh ha of cropped area during 2002-03. Among the districts, Bidar registered the highest participation rate and about 63 per cent of the farmers in the district subscribed for NAIS covering nearly 38 per cent of the cropped area in the district. Bidar was followed by Dharwad with more than half (52 per cent) of the 4 lakh farmers opting for crop insurance covering 25 per cent of the 13.26 lakh ha of cropped area in the district. In southern region, Hassan district had the highest coverage both in terms of proportion of farms and area covered (25 per cent) under NAIS. In Kodagu, only 13 per cent of the 59 thousand farmers participated in crop insurance but the area covered accounted for 32 per cent of the cropped area in the district. On the other hand, a quarter of the farmers from Uttar Kannada opted for crop insurance covering little more than 40 per cent of the area in the district.

Table 7.20 : Percentage of Farmers and Area in the District Covered under NAIS in 2002-03

Districts	Total Farms (lakh)@	% of Holdings Insured	Total Area Sown (Lakh Ha)	% Area Insured
Bijapur	4.41	19.48	13.51	12.77
Belgaum	4.34	25.87	9.96	14.69
Bellary	2.54	3.84	5.55	3.86
Bidar	1.95	63.01	4.36	37.74
Dharwad	4.07	51.06	13.26	24.59
Gulbarga	4.80	18.12	13.97	11.96
Raichur	4.26	9.73	10.58	7.23
Northern zone	**26.37**	**25.30**	**71.19**	**15.09**
Bangalore	3.48	0.29	3.24	0.27
Chiradurga	3.23	13.05	9.17	9.66
Kolar	3.38	4.64	2.48	6.59
Tumkur	4.10	5.29	5.22	9.17
Central zone	**14.19**	**5.68**	**20.10**	**7.64**
Hassan	3.65	24.79	3.13	25.28
Mandhya	4.37	1.06	2.47	1.60
Mysore	4.59	11.41	6.17	8.60
Southern zone	**12.61**	**11.70**	**11.77**	**11.56**
Chickmaglur	1.67	10.85	1.79	9.73
D. Kannada	2.93	0.57	1.68	1.00
Kodagu	0.59	13.18	0.43	32.26
Shimoga	2.37	22.49	2.31	23.71
U. Kannada	1.48	25.08	1.10	40.44
Hills & coastal zone	**9.04**	**13.07**	**7.31**	**18.07**
State	**62.21**	**16.29**	**110.37**	**13.56**

@ Based on the Agricultural Census of 1995-96

7.2.4. Area insured under major crops

There is a wide variation in the proportion of area insured under a specific crop or crop group (Table 8.19). Based on years of experience, value of output and riskiness of the crop, farmer decides about buying the crop insurance cover. It can be seen from Table 7.21 that more than one fifth (22 per cent) of the area under pulses had been insured under NAIS during 2002-03. Most of the pulses are prone to insect/pest attack and are susceptible to a host of diseases. Changes in the weather condition like cloudy weather or un-seasonal rains affects the yield of pulse crops significantly. Oilseeds are important cash crops in dryland regions of the state and more than 16 per cent of the 20 lakh ha under oilseeds had been covered under insurance. Though cereals and millets occupied more than 50 per cent of the cropped area, less than 10 per cent of

the area under cereals and millets had been insured during 2002-03. The area under annual commercial and horticultural crops is on the rise. However, all the annual commercial and horticultural crops are not covered under the crop insurance scheme due to lack of reliable and adequate data. The proportionate area insured accounted for more than 15 per cent of the area under annual commercial and horticultural crops in Karnataka during 2002-03.

Table 7.21 : Percentage of the Total Area Insured under Major Crop Groups

Sl. No.	Crops	Area Sown (Lakh Ha)	% of Cropped Area Insured
1.	Cereals & Millets	57.45	9.33
2.	Pulses	19.20	22.01
3.	Oilseeds	19.82	16.36
4.	Annual commercial / horticultural crops	13.89	15.36
5.	All	110.37	13.56

7.2.5. Average area and sum insured by seasons

The average area insured between 2000-2001 and 2002-03 for small and marginal farmers was 1 and 1.38 ha respectively during kharif and rabi seasons. In the case of other farm category, the average area covered under NAIS was 2.17 ha during kharif and 1.62 ha during rabi season (Table 7.22). On an average, 1.5 ha of cropped area per farmer had been insured during kharif as well as rabi season. Average sum insured per farmer was higher during kharif season when compared with rabi season. Average area insured per loanee farmer was higher than the non-loanee farmer and the same was true for the average sum insured per household. However, the average sum insured by loanee farmer was higher (Rs. 17,747) during rabi season when compared with (Rs. 12,418) the sum insured in kharif. The sum insured by non-loanee farmer was higher (Rs. 8,879) in kharif when compared to that (Rs. 5,900) of rabi season.

Table 7.22 : Average Area and Sum Insured by Farm Size Categories and Status of Borrowing

Farmer Category	Kharif Season		Rabi Season	
	Average Area (Ha)	Sum Insured (Rs)	Average Area (Ha)	Sum Insured (Rs)
Small/marginal	1.00	7,994	1.38	6,814
Others	2.17	14,917	1.62	9,151
Total	1.54	11,178	1.55	8,483
Loanee	1.73	12,418	2.21	17,747
Non-loanee	1.18	8,879	1.37	5,900
Total	1.54	11,178	1.55	8,483

7.2.6. Financial viability of NIAS in Karnataka

The analysis of crop insurance business for six seasons (2000-01 to 2002-03) indicated that indemnity payments exceeded the premium collected during two of the three years. The indemnity claim paid was Rs. 32.69 million as against the premium of Rs. 104.94 million collected during 2000-01 (Table 7.23). Indemnity payments exceeded the premium in the following two years 2001-02 and 2002-03.

Table 7.23 : Premium Collected, Indemnity Payments and Loss Cost Ratio

Year/ Season	Claims (Rs. Million)	Premium (Rs. Million)	Sum Insured (Rs. Million)	Claim Premium Ratio	Claim Sum Insured Ratio (%)	% Of Farmers Benefited
Kharif						
2000-01	21.30	95.47	3,467.52	0.22	0.61	6.65
2001-02	1,197.74	142.89	5,163.89	8.38	23.19	53.12
2002-03	2,613.88	388.93	11,616.51	6.72	22.50	62.68
Kharif total	3,832.92	627.28	20,247.91	6.11	18.93	49.35
Rabi						
2000-01	11.39	9.47	459.89	1.20	2.48	3.45
2001-02	162.26	15.78	617.15	10.28	26.29	95.43
2002-03	276.07	30.01	1,027.91	9.20	26.86	65.22
Rabi total	449.72	55.26	2,104.95	8.14	21.36	63.17
Kharif+Rabi						
2000-01	32.69	104.94	3,927.40	0.31	0.83	6.30
2001-02	1,360.00	158.67	5,781.03	8.57	23.53	57.27
2002-03	2,889.95	418.93	12,644.42	6.90	22.86	63.03
All	4,282.64	682.54	22,352.86	6.27	19.16	51.01

The insurance corporation had to pay Rs 8.6 and Rs. 6.9 per rupee of premium collected in 2001-02 and 2002-03, respectively. The loss cost ratio (ratio of claims to sum insured) was less than one per cent during kharif and 2.5 per cent during rabi season of 2000-01, the first year of NAIS in Karnataka. However, in the following two years loss cost ratio was around 23 per cent indicating that the indemnity payments accounted for 23 per cent of the sum insured during those years.

The claim or indemnity sum insured ratio was consistently higher during rabi season when compared to kharif season. On an average, half (49 per cent) of the farmers buying insurance cover benefited (received indemnity payments) during kharif season whereas 63 per cent of the farmers benefited during rabi season. Thus the crop insurance programme being implemented in the state does not seem to be financially viable with the exiting rate of premium and level of indemnity payments.

CHAPTER 8 : OTHER INSURANCE SCHEMES

Earlier, CCIS and later on, NAIS achieved modest coverage (despite very high claim premium ratios) in terms of both the number of farmers as well as the crop area covered or insured since its introduction in 1985-85 till date. There are a few shortcomings in NIAS as listed earlier. As per the report of the Task Force on Agriculture set up by the Government of India (July, 2001), all the crop insurance schemes were ineffective in estimating the probability of risks covered, leading to claim payouts in the range of four to five times of the premium collected. If crop insurance is to give protection at the level of model yields, the premium might be as high as 30 per cent as against the current 1- 3.5 per cent, according to the study by the Task Force. However, there is no unique programme, which would satisfy the requirements of all categories of farmers. New innovations are being experimented and different forms of crop insurance are being introduced in the agricultural insurance market. Some of the insurance schemes have been discussed in brief below.

8.1. Income Insurance Scheme

So far whether CCIS or NIAS/RKBY provided insurance cover to the borrowers for the crop loans from institutional sources or the equivalent amount for non-borrowers. Unscientific premium devoid of any relation with actuarial calculations or probability of crop failure/ loss resulted in very high claim premium ratio and scheme proved to be non-viable. Moreover, the participation of farming community in the existing crop insurance scheme (NIAS/RKBY) is also low. To overcome the problem of non-viability and to improve the participation rate, the Agriculture Insurance Company (AIC) of India Ltd. has introduced 'Farm Income Insurance Scheme (FIIS)" on pilot basis in major wheat and paddy growing districts in the country. The scheme provides a minimum guaranteed income to the farmers, protecting them from incurring loss due to vagaries of monsoon or adverse fluctuations of market price as measured against minimum support price. The pilot scheme is being implemented in the Vadipatti block of Madurai district of Tamil Nadu State. The sum insured for paddy crop on one hectare has been fixed (at Rs. 23,650) based on the average yield in the last seven years. The value is arrived at by taking into consideration the average yield of 3,300 kg per hectare, in the last seven years and the minimum support price of Rs. 7.95 per kg fixed by the Center. Crop cutting experiments are conducted at 18 spots in the block for yield assessment.

The average yield on the experimental sites, chosen on a random basis, will be considered as the actual yield across the block and, "the income loss incurred by the farmer, if any, due to a fall in either the yield or in the minimum current market price or both, will be compensated by the agriculture insurance company". The Union Government provides a subsidy in premium to the extent of 75 per cent to small and marginal farmers and 50 per cent to others. The premium has been fixed at Rs. 296 per hectare for small and marginal farmers whereas it is Rs. 580 per hectare for others. Though all farmers, who have planted paddy after December 2003 (2003-04 crop season), in the Vadipatti block, are eligible, the farmers, who have got agricultural loans, would be compulsorily covered and others could utilize the facility voluntarily. The crop grown on a total of around 1,000 hectares would be covered by the insurance scheme implemented by the Agriculture Insurance Company.

8.2. Weather/Rainfall Insurance

It is a well-conceived fact that the crop output is conditioned by the quantity and distribution of rainfall during a year. The idea of rainfall insurance is not a new one. Mr. J.S. Chakravarti, did a pioneering work on agricultural insurance based on rainfall indices. He published a book entitled Agricultural Insurance: A Practical Scheme Suited to Indian Conditions in 1920. He had proposed a rain insurance scheme for the then Mysore state and for India as a whole to protect farmers against drought. His scheme of crop insurance is analogous to homogeneous area approach in that he suggests the areas with same annual average rainfall as the unit for crop insurance. In his scheme of crop insurance, an insurance contract will be based on the crop production cycle. The crop production/crop growth cycle can be suitably divided into two critical sub-periods. If the rainfall as measured at the rain-gauge at the taluka headquarters up to a certain date is less than a certain amount (below the prescribed minimum), then a certain sum of money (first installment of indemnity) is payable. Similarly, if the rainfall in the second critical period is below the prescribed minimum for that period, the second installment will be due. Thus, the two installments are independent of each other.

The National Commission on Agriculture (1976) had estimated that rainfall variations contributed for 50 per cent of the variability in agricultural yields. The variability in crop yields ranged from 45 per cent in the case of barley and sorghum to 90 per cent for cotton

and groundnut. An analysis of losses conducted by the crop cell of General Insurance of India in respect of all the losses incurred by CCIS during 1985-86 through 2001-02 indicated that about 70 per cent of the losses could be attributed to drought and low rainfall, 20 per cent towards floods and excess rainfall rest of the 10 per cent due to other factors such as storms, earthquakes, diseases and pests, etc (Parchure, 2003). Similarly, Rao, Ray and Subbaao (1988) estimated the output elasticity with respect to rainfall for major crops. It is observed that an adverse deviation of 1 per cent in rainfall resulted in 0.8 per cent reduction in rice output, 0.15 per cent in wheat output and around 0.60 per cent in the case of course cereals (Table 8.1).

Table 8.1 : Output Elasticity with Respect to Rainfall (1980s)

Crops	Elasticity Estimates	
	Range	Mean
Rice	0.75 - 0.85	0.80
Wheat	0.10 - 0.20	0.15
Course cereals	0.55 - 0.70	0.58
Total cereals	0.50 - 0.60	0.55
Pulses	0.60 - 0.70	0.65
Kharif foodgrains	0.70 - 0.80	0.75
Rabi foodgrains	0.15 - 0.25	0.20
Total foodgrains	0.55 - 0.65	0.60
Oilseeds	0.20 - 0.32	0.28
All crops	0.35 - 0.45	0.40

Source: Rao, Ray and Subbaao (1988).

The adverse deviation in rainfall impinged more on pulse output when compared to coarse cereals. Similarly, impact of adverse rainfall was more conspicuous on the output of kharif foodgrains when compared with those of rabi foodgrains. For every adverse deviation in rainfall by 1 per cent output of kharif foodgrains declined by 0.75 per cent as against just 0.20 per cent decline in rabi foodgrains at the all India level. The output elasticity varied across the regions and over time (Annex Table 11). Considering the profound impact of rainfall on crop output, it is suggested to explicitly recognize rainfall as the major peril and design the insurance system to immunize farm incomes against adverse deviations in rainfall to reduce volatility of farm income (Parchure 2003). An insurance system considering rainfall as the dominant peril satisfies most of the essential conditions required for successful implementation of the insurance scheme. These conditions are:

- The farmers, as insured would have no control over the loss event and its reporting

- The size of loss would be quantifiable in financial terms

- Problems of moral hazard and adverse selection would be minimized or eliminated

- The insurance provider would be in position to buy reinsurance cover from international market

8.2.1. ICICI Lombard Crop Insurance Scheme *(Based on material available on internet)*

Weather insurance has been extensively used in the fields of agriculture, energy, leisure industry, reinsurance of property and casualty in countries like US, Canada (Alberta, Ontario), Netherlands, Argentina, OECD countries (including Mexico), South Africa, and Uganda. In weather insurance, the claim is settled on the basis of a transparent index. An index is created by assigning different weights to critical time periods. The past weather data are mapped on to this index to arrive at a normal threshold index. The actual weather data are then mapped to the index to arrive at the actual index level. In case there is a material deviation between the normal index and the actual index, compensation is paid out to the insured on the basis of a pre-agreed formula.

ICICI Lombard, World Bank and the Social Initiatives Group (SIG) of ICICI Bank collaborated in the design and pilot testing of India's first Index-based Weather Insurance product. The pilot test covered 200 groundnut and castor farmers in the rain-fed district of Mahabubnagar, Andhra Pradesh. The policy was linked to crop loans given to the farmers by BASIX Group and sold through its Krishna Bhima Samruddhi Local Area Bank.

The insurance policy was linked to the amount of rainfall in the district within five months of the insurance cover (May 10, 2003 to Oct 10, 2003). Based on the rainfall data collected for the past 30 years from the Indian Meteorological department, a rainfall index was computed. Different weightages were attached to different periods according to the requirement of rainfall for the specific crop. Any shortfall of rainfall compared to the anticipated normal rainfall index was to be compensated on a Standard Loss Rate per cent of the shortfall subject to a maximum of the Sum Insured. A cumulative

weighted average of the past weather data was taken to arrive at the anticipated normal index (the Anticipated Normal Rainfall Index specific to the pilot project was 653 mm for groundnut and 439 mm for the castor crop). The premium and the Sum Insured were calculated on the basis of the amount of land owned by the farmer.

Payout experience: Mahabubnagar district received the best rainfall in the past five years. However, the monsoon was delayed leading to delayed sowing and in turn affecting the yield of Groundnut. Since the weights were assigned to the different time periods, the delayed monsoon reflected in the weighted actual index level. Since there was a material deviation from the normal index, the claim was settled within 15 days of the end of the cover period.

The weather insurance has also been extended to 50 soya farmers in Madhya Pradesh through Pradan, an NGO and 600 acres of paddy crop in Aligarh through ICICI Bank's Agribusiness group along with the crop loans. ICICI Lombard is currently exploring the feasibility of weather index based crop loan insurance instruments for various crops across the country.

Challenges : The main challenges pertaining to a scale up of weather insurance are as follows

- Awareness and education about the product: At the village level, farmers need to be convinced about the workability of the product. In addition, other stakeholders who have major roles to play in managing weather-related risks in the public as well as private sectors (including government, NGOs and banks with crop loan advances) have little knowledge about how they can use the product to hedge their risks.

- Availability of reliable data in electronic format for various districts and sub- districts/tehsils within India.

- Installation of additional weather stations to collect farm-specific data that can transmit weather data on a real time basis. It may be noted that it is important to structure the weather indices on the basis of location specific data as far as possible, so that "basis risk" is minimal.

- Secure and objective source of current weather measurements.

8.3.   Seed Crop Insurance Scheme

The Government of India introduced a Scheme for Seed Crop Insurance with effect from rabi 1999-2000. The main objective of the scheme is to strengthen the confidence of the seed breeders and growers and to provide financial security in the event of seed crop failure. The seed production activity covered under the insurance includes production of breeder's seed, foundation seed and Certified seed. The scheme covers major crops like Paddy, Wheat, Maize, Sorghum, Pearl millet, Pigeonpea, Chickpea, Groundnut, Soybean, Sunflower and Cotton in the states of Andhra Pradesh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, and Uttar Pradesh.

The scheme covers all the natural risks faced by the seed grower/breeder at different stages. (A) Failure of seed crop either in full or in part due to natural risk, (b) Loss in expected raw seed yield, (c) Loss of seed crop after harvest, and (d) at seed certification stage. The premium rates for the seed crop have been presented in Table 10.4. The sum insured is equivalent to the average of preceding three/five years' foundation and certified seed yield of the identified unit area multiplied by 'Procurement Price' of the seed crop variety offered by the National Seeds Corporation /State Seeds corporations.

Table 8.2 : Premium Rates for Major Seed Crops

Sl.No.	Crops	Premium Rate (%)
1	Paddy	3.0
2	Wheat	2.00
3	Sorghum	3.50
4	Pearl millet, Maize	5.00
5	Groundnut	2.00
6	Sunflower	2.50
7	Pigeonpea, Chickpea	5.00
8	Cotton, Soyabean	5.00

8.4.   Livestock Insurance

The General Insurance Corporation (GIC) of India is implementing cattle insurance programme. The insurance cover is provided for the sum insured or the market value at the time of death whichever is less. Animals are insured normally for the full market value. Owners

of cross-bred cows/buffaloes are the major client group for livestock insurance. It is mandatory to insure animals purchased under IRDP programme with the financial assistance from the bank. The animals insured include sheep and goats also. Sheep and goats constitute nearly one fourth of the total livestock insured by the GIC of India. The insurance cover provides protection to the owner in the event of death of insured animal. The progress made in livestock insurance has been presented in Table 7.5 below. The number of animals insured declined during last three years.

Table 8.3 : Livestock Insurance

Sl. No.	Year	No. of Animals Insured (Million)	Premium Collected (Rs. Crore)	Claims Amount (Rs. Crore)	Claims to Premium Ratio
1	1995-96	15.3	113.39	74.05	0.65
2	1996-97	14.7	122.54	74.83	0.61
3	1997-98	6.3	143.45	80.11	0.56
4	1998-99	7.9	152.02	126.08	0.83
5	1999-2000	9.8	137.14	114.28	0.83
6	2000--2001	7.9	145.53	127.97	0.88

CHAPTER 9 : SUMMARY AND CONCLUSIONS

9.1. Importance and Need for Crop Insurance

Agriculture all over the world is fraught with risk and uncertainty. Risk factors involved in farming include instability of yields and farm incomes. The unfavorable weather conditions and occurrence of natural disasters impinge on production and costs where investments and allocation of resources are done well before actual yields and prices are known. In developed countries, governments often play an active role in helping producers to manage risk successfully. Different products related to agricultural insurance are available in the developed countries. Agricultural insurance has been introduced in many developing countries following different approaches.

The ad hoc relief measures taken up by the Government in the face of natural calamities like re-scheduling of loans, supply of seed and other inputs for the following season and other relief measures are benefits and the farmers cannot expect these as a matter of right. There are a few traditional strategies adapted by the farmers to mitigate the risk and to smooth consumption. These strategies include sale of buffer stocks/stored foodgrains, sale of livestock and jewellery, borrowals for consumption, transfers from friends and relatives, labour market participation and migration. The farmer tries to minimize risk through renting out land on fixed rent or sharing crop output. Crop diversification/inter- cropping also reduces the shocks of unfavourable weather conditions, and the probability of complete crop failure is reduced. However, crop diversification or intercropping results spreading limited resources thinly which, otherwise, would have been used in securing maximum returns. Thus, the traditional mechanisms are costly and relatively ineffective in reducing risk in farming. Efficient risk reducing and loss management strategies such as crop insurance would enable the farmer to take substantial risks without being exposed to hardship. Access to formal risk diffusing mechanisms would induce farmers to maximise returns through the adoption of riskier options. Investment in development of groundwater, purchase of dairy cattle of exotic breeds would be encouraged due to insurability of the investment. This helps the individual to augment and increase the farm income (micro perspective) and also help to augment aggregate production in the country (macro perspective).

Crop insurance originated a century back in the United States of America. Many private companies entered into the field of crop insurance and disappeared over time. Finally, the Federal Crop Insurance Act was passed in 1938 and the Federal Crop Insurance Corporation (FCIC), an agency within the U.S. Department of Agriculture was established to implement crop insurance programme in USA. In Japan, crop insurance scheme was implemented from April 1939 and provided nationwide coverage for paddy rice, wheat, barley and mulberry. The crop insurance programme is being implemented in many developing countries either in public sector or by private sector. In India, the history of crop insurance (rainfall insurance) dates back to 1930 when Mr. Chakravarti wrote a book on crop insurance and provided a practical guide for implementing the rainfall insurance to safeguard the farmers from drought. However, the crop insurance was introduced on pilot basis in mid 1970s and thereafter, at the national level from 1985-85 onwards.

Considering the overwhelming impact of nature on agricultural output and its disastrous consequences on the society, in general, and farmers in particular, the present study was taken up to study the phases of development of crop insurance and its coverage over space and time in Karnataka. The specific objectives of the study were:

Objectives

♦ To study the need, coverage and issues involved with crop insurance

♦ To analyse the various approaches and economic viability of crop insurance

♦ To study the various phases of crop insurance in the country.

♦ To study the coverage of crop insurance scheme in Karnataka

♦ To study the viability of crop insurance

♦ To suggest ways and means to improve the crop insurance scheme

The study is based on secondary data gathered mainly from the General Insurance Corporation of India limited, the agency responsible for implementing the comprehensive crop insurance scheme in the country.

9.2. Comprehensive Crop Insurance Scheme (CCIS)

After successful testing of the crop insurance scheme as a pilot programme, it was introduced at the national level from Kharif 1985. The CCIS was applicable to the farmers who took crop loans from formal credit institutions such as commercial banks, regional rural banks and cooperatives. Only a few major crops (cereals, pulses and oil seeds) were covered under the scheme. The scheme was voluntary in nature during the initial phase but was made compulsory for borrowers. The sum insured was equal to the loan amount borro-wed. The insurance policies were issued in favour of the institutional credit agencies. The crop insurance scheme was multi-peril insurance in nature as it covered almost all the natural risks except war and nuclear risks. The premium and indemnity rates for individual crop were calculated for the homogeneous area (taluka or revenue circle) based on the crop cutting data for 10 preceding years. The threshold yield for various crops ranged between 50 to 80 per cent of the normal yield of the area during the specific season. The maximum indemnifiable limit was the difference between threshold yield and the actual yield during the season. The Union Government and the State Government shared the premium as well as claims in the ratio of 2:1. The premium rates were fixed at 2 per cent for cereals and millets and 1 per cent for pulses and oilseeds, the premium paid by small and marginal farmers was subsidized to the extent of 50 per cent.

9.3. Major Findings and Policy Implications - CCIS

♦ The total number of farmers participating in CCIS increased from 3.85 million in 1985-86 to 6.76 million in 1987-88. However, it declined in the following years and was the lowest (2.74 million) in 1990-91. This was due to uncertainty about the continuance of the scheme and delay in taking the decision by the government authorities. The number of farmers opting for insurance hovered around 5 million in the first half of 1990s and around 6 million in the second half of 1990s. The area insured was the highest (11.65 million ha) during 1987 and the lowest (4.48 million ha) during 1990-91 crop years. The number of total farmers covered under CCIS from 1985-86 through 1999 was 76.27 million and the area covered was 127.57 million ha.

♦ Though the Scheme was in operation, some of the states like Punjab and Haryana, facing lower risk in production, did not participate in the CCIS whereas a state like Rajasthan

discontinued participation after one year due to its inability to share indemnity payments.

♦ The average number of farmers (holdings) covered under CCIS were less than 5 (4.64) per cent of the total holdings in the country and the average area insured accounted for 4.61 per cent of the gross sown area during the reference period from 1985 through 1999.

♦ The total indemnity payments were to the tune of Rs. 23,038.54 million as against the premium of Rs. 4,035.59 million. Thus, the GIC had to pay Rs. 5.71 per rupee of premium collected.

♦ The number of farmers as well as area covered under CCIS during the kharif season accounted for more than 80 per cent of the total farmers and the area covered under CCIS. The same was true in the case of sum insured and premium collected. However, the indemnity payments during kharif accounted for 95 per cent whereas premium collected during kharif shared only 81 per cent of the total premiums.

♦ The total claims paid over premium accounted for 2.88 per cent of the actual plan expenditure on agriculture and it varied from 0.53 per cent of the plan expenditure in agriculture in 1994-95 to 9.53 per cent in 1987-88.

♦ The ratio of indemnity payments to sum insured or loss cost ratio ranged between 3.09 per cent in 1994-95 and 17.91 per cent in 1987-88 with an overall average of 9.22 per cent. In other words, GIC paid on an average little more than 9 per cent of the sum insured as indemnity payments to the farmers (financial institutions).

♦ The number of farmers as well as area covered under CCIS during kharif season accounted for more than 80 per cent of the total farmers and area covered under CCIS. The same was true in the case of sum insured and premium collected. However, the indemnity payments during kharif accounted for 95 per cent whereas premium collected during kharif shared only 81 per cent of the total premiums.

♦ The claims paid and premium collected for various crops under CCIS varied significantly. For example, the premium collected for paddy shared more than half (54 per cent) of the total premiums whereas claims paid for paddy accounted for a quarter of the

total claims paid by the GIC during 1985 through 1999. The premium collected and claims paid for wheat accounted for 13 per cent and 2 per cent of the total premium and claims, respectively. On the contrary, claims paid for groundnut (Rs. 12,217 million) accounted for more than half (53 per cent) of the total claims when compared with 15 per cent (Rs. 604 million) contribution to the total premium. The same was true in the case of pearl millet and pulses and their share in claims was higher than their contribution to the total premium collected under CCIS.

♦ The claim premium ratio was highest (20.22) in the case of groundnut and lowest (0.88) in the case of wheat.

♦ The state governments decide about participation in and withdrawal from the scheme. Hence, there are good chances for adverse selection. The states having stable agricultural production and facing relatively lower risk would opt out of the scheme leading to the problem of adverse selection.

♦ The state government had to identify the crops and area in which the scheme would operate. This also gave rise to adverse selection of regions and crops within the state.

♦ The so called homogeneous unit area for determining the threshold yields and assessment of actual yield was too large to be homogeneous considering the variation in soil and weather parameters.

♦ The premium rates charged at 2 per cent for cereals and 1 per cent for pulses and oilseeds was too low and did not have any actuarial base. This resulted in the loss ratio (claim premium ratio) of more than 5. Hence, CCI did not appear to be financially viable.

♦ The total area under the crop and area insured in the region were at variance.

♦ Insurance cover under the CCIS is available to loanee farmers and a large number of farmers who do not borrow from institutional sources are deprived of crop insurance benefits.

♦ Even if indemnities were paid, this did not improve liquidity position of farm households in the event of crop failure. The delay in settlement of claims by GIC did not make a farmer eligible to avail the loan in the next season.

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9.4. Major Findings and Policy Implications - NAIS/RKBY

A new model of crop insurance programme called as Natioal Agricultural Insurance Scheme (NAIS) or Rashtriya Krishi Bima Yoana (RKBY) was launched formally by the Prime Minister on 23rd June 1999. The NAIS addressed some of the issues and shortcoming present in the earlier CCIS. The state governments were at liberty to take the decision about participation in the scheme or otherwise. The participation in RKBY was compulsory for farmers growing notified crops and availing crop loans from formal credit institutions. However, non-borrower farmers growing notified crops were also eligible to opt for the Scheme on voluntary basis. In case of loanee farmers the Sum Insured (SI) would be equal to the amount of crop loan advanced. However, the farmer had the option to insure the amount equivalent the value of threshold yield of the insured crop. A farmer might also insure his crop beyond value of threshold yield level up to 150 per cent of the average yield of the crop in the notified area on payment of the premium at commercial rates. Moreover, RKBY had the provision to compensate individual farmers who suffered crop loss due to localized event like hailstorm or floods. The list of insurable crops has been expanded to include annual commercial and horticultural crops. The major findings and policy implications of NAIS have been summarized below:

- Provides greater coverage in terms of both farmers and crops as non-loanee farmers are made eligible to buy insurance cover. Moreover, insurance is now extended to commercial and horti-cultural crops.

- Provides grater coverage of risk as amount higher than crop loan can be insured by paying additional premium.

- The unit area for estimating threshold yields as well as for estimating actual yields is required to be reduced to the village panchayat from the existing block or taluk level.

- To ensure viability of NAIS, premiums are to be based on actuarial considerations and the practice of subsidising premium of small and marginal farmers is to be phased out in 5 year period on sun-set basis.

- Initially, NAIS was implemented in only 9 states and covered 0.58 million farmers and 0.78 million ha of cropped area in the 9 states. The number of participating states increased to 21 by 2003.

- The total number of 33.82 million farmers and 52.71 million ha of cropped area were insured under NAIS between 1999 rabi and 2003. The total sum insured was to the tune of Rs. 291.293 billion (291,293.43 million). The indemnity payments added up to Rs. 38,037 million as against Rs. 8,974.36 million during the reference period of 1999-2003. The claim premium ratio was 4.24. About 38 per cent of the farmers buying insurance cover received indemnity payments under NAIS.

- As in the case of CCIS, uniform rate of premium across the states and regions discourages states with stable production and lead to adverse selection.

- Literature suggests that farmers are averse to risk and availability and access to formal crop insurance helps the farmer to opt for risky decisions, which have higher pay-offs. Thus, insurance helps to augment farm income at the individual level and in turn, promotes investment in agriculture, which helps in creating opportunities for gainful employment in the rural areas. Thus, contributing to rural development and enhancement in the welfare of rural population.

- Based on the long experience (one and half decade) gained through implementation of CCIS and five years of NAIS, the following issues need attention:

- Area approach should continue considering hobli or revenue village as a homogeneous area for indemnity payments.

- Differential rate of premium based on the variability in yield levels in the past and movement towards premium rates based on actuarial principles. Strive to develop self sustaining model of crop insurance which not only will cover the claims but also administrative costs and generate surplus to absorb shocks in case of catastrophic losses.

- Awareness campaign to induce non-borrowers to buy insurance covers for major/notified crops.

- It will be more prudent if the expected revenue from the crop (as in the United States of America) is insured. This helps the farmers to manage their consumption needs in the event of crop failure.

- Different/innovative insurance products covering different risk need to be introduced in place of multi-peril crop insurance.

- Insurance product based on rainfall or the model suggested by Mr. Chakravarti with some modifications (if required) is worth trying. This will benefit not only the farming community but also the landless in the event of adverse deviation in precipitation in the area.

- Larger coverage of area across varied agro-climatic zones in the country will help reduce the incidence of co-variate risk and losses to the implementing agency.

- The insurance agency should explore the possibility for re-insurance with international insurance agencies to safeguard against the catastrophic losses.

Table 1 : Changes in Cropping Pattern during the Last Five decades

(Area in Percentages)

Crops	1950-51	1960-61	1970-71	1980-81	1990-91	1997-98
Rice	23.6	22.3	22.6	23.3	23.0	22.8
Wheat	7.6	8.5	11.0	12.8	12.9	14.0
Coarse cereals	30.0	29.4	27.8	24.6	19.5	16.3
Total cereals	61.1	60.2	61.4	60.7	55.4	53.1
Total pulses	15.6	15.5	14	13.2	13.5	12.5
Total foodgrains	76.7	75.7	75.4	73.9	68.9	65.5
Total oilseeds	8.3	8.3	8.9	9.2	13.5	15.1
Cotton	4.3	5.0	4.7	4.5	4.1	4.6
Jute	0.4	0.4	0.4	0.5	0.4	0.5
Total fibres	5.1	5.7	5.5	5.4	4.7	5.3
Sugarcane	1.3	1.6	1.6	1.6	2.0	2.2
Tobacco	0.3	0.3	0.2	0.3	0.2	0.2
Condiments & spices	0.9	1.0	1.1	1.2	1.3	1.6
Fruits	0.6	0.7	0.9	1.1	1.4	1.7
Potatoe	0.1	0.2	0.3	0.4	0.5	0.6
Onion	0.1	0.1	0.1	0.1	0.2	0.2
Total vegetables	1.2	1.0	1.3	1.7	4.5	2.3
Other crops	5.6	5.7	5.1	5.6	5.8	7.6
Total non-foodgrains	23.3	24.3	24.6	26.1	31.1	34.5
Gross cropped area (GCA in million ha)	100.0 (131.9)	100.0 (152.8)	100.0 (165.8)	100.0 (172.6)	100.0 (185.7)	100.0 (190.8)
Net area sown	118.7	133.2	140.3	140.0	143.0	142.0
Cropping intensity	111	115	118	123	130	134

Table 2 : Changes in the Share of Major Crops Between 1980-81 and 1991 by Farm Size Groups

Crops	Operational Holding (Ha)				All
	< 2	2 - 4	4 - 10	> 10	
Paddy	-2.79	-2.6	6.49	0.48	1.46
Wheat	2.46	1.11	3.26	2.12	2.19
Jowar	0.89	0.44	-3.19	-5.52	-2.06
Total cereals	-5.22	-5.98	-0.24	-6.11	-3.69
Gram	-1.19	-1.03	-0.95	0.41	-0.96
Red gram	0.45	0.71	0.57	0.02	0.43
Other pulses	-3.45	-3.82	-5.41	-3.56	-4.01
Total pulses	-1.61	-1.38	-3.13	-1.19	-2.01
Groundnut	0.13	0.37	0.25	-0.95	-0.32
Rapeseed & Mustard	0.8	1.57	2.31	1.75	1.5
Total oilseeds	2.71	4.66	5.72	4.88	3.88
Cotton	2.38	4.71	6.15	5.34	4.38
Total fibres	1.14	1.11	-0.95	-1.95	-0.25
Sugarcane	0.84	0.47	0.92	0.01	0.62
Fruits & Vegetables	1.28	0.97	0.92	0.69	1.19
Total food crops	-3.69	-5.25	-0.83	-5.91	-3.12
Total non-food crops	3.69	5.26	0.82	5.9	3.12

Source : Compiled from the Input Survey Report, GOI

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Table 3 : Claim/Premium Ratios by States

State	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Andhra Pradesh	1.43	8.76	1.94	1.15	5.58	2.41	7.32	2.80	0.69	3.01	1.90	6.48	6.68	2.07	6.77
Assam	N.A	1.65	0.33	3.63	2.87	0.60	0.98	1.60	0.17	1.27	3.19	5.26	0.77	1.02	0.14
Bihar	0.11	0.00	2.38	0.32	0.80	1.05	5.67	9.42	0.94	0.71	2.79	1.39	2.09	4.84	1.63
Goa	0.00	7.81	0.79	0.00	0.00	0.00	0.19	0.91	0.18	2.09	0.32	0.21	0.07	2.40	0.80
Gujarat	38.58	25.51	65.72	0.63	2.75	22.90	36.88	0.22	35.59	0.84	14.40	0.60	0.25	3.36	34.12
Himachal Pradesh	N.A	5.98	12.63	6.28	0.01	0.00	0.00	6.85	9.15	2.17	0.15	0.33	0.00	1.09	0.00
Jammu and Kashmir	N.A	0.15	4.72	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Karnataka	6.78	3.47	6.11	N.A	1.04	1.53	1.35	5.64	2.44	0.79	1.77	2.10	7.28	1.52	3.10
Kerala	1.78	4.33	0.36	0.39	0.00	0.17	1.76	0.98	1.62	10.04	1.01	5.07	1.61	0.42	1.78
Manipur	N.A	N.A	0.00	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Madhya Pradesh	0.95	7.10	3.60	5.10	0.89	0.48	2.96	1.19	0.19	1.15	1.40	2.83	4.95	4.51	0.93
Maharashtra	14.36	13.34	4.89	7.19	0.27	0.50	7.10	0.44	0.27	1.99	3.71	1.28	9.08	2.94	1.14
Meghalaya	N.A	N.A	0.00	3.01	2.06	0.00	0.00	1.10	0.66	2.64	0.44	3.29	0.00	4.21	0.00
Orissa	0.22	0.18	10.88	0.75	0.28	5.17	1.28	5.33	0.93	5.27	2.91	15.48	1.96	3.55	13.01
Rajasthan	0.48	17.23	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Tamil Nadu	1.15	0.80	0.87	0.81	0.58	1.71	0.89	1.50	5.60	0.73	3.77	7.65	1.32	0.20	0.36
Tripura	3.78	0.51	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.45	0.00
Uttara Pradesh	0.05	0.41	1.14	N.A	4.38	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
West Bengal	0.37	1.74	1.37	2.45	0.31	4.02	0.25	0.30	0.58	0.52	1.44	0.37	0.78	2.75	1.03
Andaman & Nicobar	0.00	1.26	5.24	N.A	0.00	0.00	0.00	0.00	0.00	0.00	N.A	0.04	4.66	3.50	1.26
Delhi	0.00	0.00	0.00	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Pondicherry	0.97	0.37	0.01	N.A	1.45	0.00	0.24	0.38	12.22	0.00	0.00	2.31	4.91	0.70	0.89
Total	6.28	8.92	10.36	2.75	2.16	7.67	11.13	2.22	7.38	1.95	4.34	4.38	4.51	2.77	10.49

Note: N.A. - Not Applicable

Table 4 : Coverage of CCIS during Kharif Season

(In Percentages)

Years	Farmers	Area Covered	Sum Insured	Premium Collected	Claims	Claim/ Premium Ratio
1985	68.50	69.86	69.48	67.77	96.43	8.93
1986	77.80	78.66	77.94	76.84	97.36	11.30
1987	68.52	72.21	70.58	68.34	95.83	14.52
1988	77.33	83.79	77.04	73.96	88.29	3.29
1989	86.49	87.39	85.22	83.97	92.28	2.38
1990	70.99	76.12	72.41	68.60	95.28	10.65
1991	82.47	85.95	81.83	79.79	97.00	13.53
1992	84.34	87.43	83.02	81.20	86.01	2.36
1993	83.80	86.09	82.50	80.84	93.94	8.58
1994	83.62	86.64	83.43	81.72	90.75	2.17
1995	84.46	85.93	82.45	79.82	88.62	4.82
1996	82.98	85.22	80.01	77.31	87.99	4.98
1997	85.56	86.10	84.78	82.70	92.52	5.04
1998	85.36	81.08	83.96	82.60	94.98	3.19
1999	100.00	100.00	100.00	100.00	100.00	10.49
Total	82.04	83.51	83.00	81.01	94.85	6.68

Table 5 : Coverage of CCIS during Rabi Season

(In Percentages)

Years	Farmers	Area Covered	Sum Insured	Premium Collected	Claims	Claim/ Premium Ratio
1985	31.50	30.14	30.52	32.23	3.57	0.70
1986	22.20	21.34	22.06	23.16	2.64	1.02
1987	31.48	27.79	29.42	31.66	4.17	1.37
1988	22.67	16.21	22.96	26.04	11.71	1.24
1989	13.51	12.61	14.78	16.03	7.72	1.04
1990	29.01	23.88	27.59	31.40	4.72	1.15
1991	17.53	14.05	18.17	20.21	3.00	1.65
1992	15.66	12.57	16.98	18.80	13.99	1.65
1993	16.20	13.91	17.50	19.16	6.06	2.34
1994	16.38	13.36	16.57	18.28	9.25	0.99
1995	15.54	14.07	17.55	20.18	11.38	2.45
1996	17.02	14.78	19.99	22.69	12.01	2.32
1997	14.44	13.90	15.22	17.30	7.48	1.95
1998	14.64	18.92	16.04	17.40	5.02	0.80
1999	0.00	0.00	0.00	0.00	0.00	0.00
Total	17.96	16.49	17.00	18.99	5.15	1.55

Table 6 : Percentage of Short-Term Loan Covered under CCIS by Year

Year	Sum Insured (Rs. Millions)	Short Term Credit (Rs. in Crores)	Percentage of Short Term Credit Covered under CCIS
1985	7,811	4,529	17.25
1986	10,986	4,512	24.35
1987	16,161	5,516	29.30
1988	7,148	5,884	12.15
1989	10,255	6,499	15.78
1990	7,114	5,979	11.90
1991	11,383	6,611	17.22
1992	14,206	7,665	18.53
1993	15,872	9,752	16.28
1994	18,769	11,932	15.73
1995	21,638	15,273	14.17
1996	24,666	16,956	14.55
1997	26,298	18,632	14.11
1998	29,110	20,601	14.13
1999	28,331	23,694	11.96
Total	249,749	164,035	15.23

Table 7 : Variability in Crop Yields of Major Crops Across Major States

Paddy					
Year	West Bengal	Punjab	Uttar Pradesh	Andhra Pradesh	Tamil Nadu
1980-85	18.02	5.32	9.60	3.71	9.26
1985-90	9.93	8.39	12.82	10.86	9.96
1990-95	6.42	3.36	3.58	5.86	5.33
1995-2000	5.12	4.54	6.90	5.36	12.67
Sorghum					
	Maharashtra	Karnataka	Madhya Pradesh	Andhra Pradesh	Tamil Nadu
1980-85	2.90	7.99	10.84	12.13	12.45
1985-90	29.85	9.58	13.29	14.13	5.48
1990-95	20.64	13.28	20.03	13.62	6.57
1995-2000	16.16	4.3	8.13	4.49	12.58
Pearl millet					
	Maharashtra	Gujarath	Uttar Pradesh	Rajasthan	Tamil Nadu
1980-85	20.13	12.98	14.63	41.48	17.38
1985-90	38.11	36.56	15.81	57.28	9.46
1990-95	25.96	29.49	9.34	39.49	4.11
1995-2000	20.40	16.42	7.97	26.49	7.33
Groundnut					
YEAR	Gujarath	Tamil Nadu	Andhra Pradesh	Karnataka	Maharashtra
1980-85	16.46	34.27	19.57	43.10	14.34
1985-90	82.18	4.17	9.09	8.66	23.98
1990-95	56.54	11.62	11.82	12.47	17.14
1995-2000	48.58	4.82	27.63	21.59	9.58
Pigeon.pea					
	Maharashtra	Uttar Pradesh	Karnataka	Gujarat	Madhya Pradesh
1980-85	10.06	13.25	14.55	4.86	21.14
1985-90	15.55	7.61	15.27	34.1	18.6
1990-95	27.92	8.77	27.06	17.93	10.39
1995-2000	29.61	9.72	29.16	12.7	15.58

Table 8 : Percentage of Farmers and Area Covered under CCIS in Karnataka during Kharif

Year	Farmers	Area	Sum insured	Premium	Claim
1985	86.06	87.09	82.89	83.94	84.03
1986	93.96	93.70	91.93	92.32	91.28
1987	94.50	92.24	93.50	94.36	97.36
1988	0.00	0.00	0.00	0.00	0.00
1989	95.73	94.82	95.57	94.88	94.42
1990	89.31	88.52	84.88	85.51	72.96
1991	93.19	92.15	89.60	90.05	83.74
1992	88.89	91.12	87.35	85.31	98.03
1993	79.44	89.23	82.31	80.33	96.74
1994	88.13	89.85	86.44	86.19	86.96
1995	94.17	93.33	90.33	89.16	96.62
1996	93.39	92.49	89.96	88.63	97.13
1997	93.58	92.16	91.02	89.78	92.66
1998	91.83	90.67	90.02	89.13	91.56
1999	100.00	100.00	100.00	100.00	100.00
All	92.39	92.60	91.17	90.44	94.49

Table 9 : Percentage of Farmers and Area Covered under CCIS in Karnataka during Rabi

Year	Farmers	Area	Sum insured	Premium	Claim
1985	13.94	12.91	17.11	16.06	15.97
1986	6.04	6.30	8.07	7.68	8.72
1987	5.50	7.76	6.50	5.64	2.64
1988	0.00	0.00	0.00	0.00	0.00
1989	4.27	5.18	4.43	5.12	5.58
1990	10.69	11.48	15.12	14.49	27.04
1991	6.81	7.85	10.40	9.95	16.26
1992	11.11	8.88	12.65	14.69	1.97
1993	20.56	10.77	17.69	19.67	3.26
1994	11.87	10.15	13.56	13.81	13.04
1995	5.83	6.67	9.67	10.84	3.38
1996	6.61	7.51	10.04	11.37	2.87
1997	6.42	7.84	8.98	10.22	7.34
1998	8.17	9.33	9.98	10.87	8.44
1999	0.00	0.00	0.00	0.00	0.00
All	7.61	7.40	8.83	9.56	5.51

Table 10 : Claim Premium Ratio and Claims Paid under CCIS for Major Crops in Karnataka

(Triennium Average 1995-98)

District	Paddy		Sorghum		Ragi		Groundnut		Sunflower	
	Claims Paid (Rs)	Claim/ Premium Ratio	Claims Paid (Rs)	Claim/ Premium Ratio	Claims Paid (Rs)	Claim/ Premium Ratio	Claims Paid (Rs)	Claim/ Premium Ratio	Claims Paid (Rs)	Claim/ Premium Ratio
Belgaum	470,093	3.61	0	0.00	0	0.00	4,280	0.99	17,339	5.95
Bellary	330,322	0.35	8,408	0.62	0	0.00	2,073902	3.31	1,039,615	14.76
Bangalore	0	0.00	0	0.00	0	0.00	636	0.35	0	0.00
Bijapur	0	0.00	28,072	0.92	0	0.00	3,045,154	7.17	1,158,533	2.15
Bidar	26,633	3.86	198,442	0.90	0	0.00	27,133	1.48	1,365,839	6.34
Chickmaglur	318,985	0.52	0	0.00	0	0.00	0	0.00	0	0.00
Chitradurga	131,777	0.08	2,086	0.14	14369	1.72	385,907	1.00	191,859	6.16
Dharwad	14,865,006	6.19	65,245	0.11	0	0.00	18,026,538	20.26	110,683	2.16
Gulbarga	85,472	4.97	886,130	8.22	0	0.00	2,811,736	4.51	2,916,442	6.06
Hassan	114,714	1.57	0	0.00	1729	0.17	0	0.00	11,670	8.08
Kolar	287,258	13.42	0	0.00	371	0.50	823,634	2.87	0	0.00
Mandya	635,817	2.03	0	0.00	0	0.00	0	0.00	0	0.00
Mysore	337,282	0.61	0	0.00	0	0.00	0	0.00	0	0.00
Raichur	1,783,418	1.10	38,612	2.04	0	0.00	1,834,878	4.01	918,341	3.68
Shimoga	1,344,970	0.54	0	0.00	3488	0.42	294,948	11.36	0	0.00
Tumkur	831	0.03	775	0.97	39564	0.95	509,015	2.02	0	0.00
Kodagu	504,409	0.31	0	0.00	0	0.00	0	0.00	0	0.00
U. Kannada	7,581,033	4.09	0	0.00	0	0.00	0	0.00	0	0.00
D. Kannada	33,220	0.17	0	0.00	0	0.00	0	0.00	0	0.00
State	28,851,240	1.98	1,227,770	1.19	59520	0.53	29,837,760	7.41	7,730,322	4.67

Source: Compiled from the records available at GIC of India Ltd., Bangalore.

Table 11 : Output Elasticity of Foodgrains with Respect to Rainfall

State	Percentage Deviation in Production due to 1 Per cent Deviation in Rainfall from Normal Value	
	1961 - 1970	1970 - 1985
Andhra Pradesh	0.14	0.11
Assam	0.02	0.10
Bihar	0.84	0.31
Gujarat	0.35	0.35
Haryana	0.53	0.10
Himachal Pradesh	0.41	0.21
Jammu & Kashmir	0.02	Neg.
Karnataka	0.33	0.58
Kerala	0.19	0.06
Madhya Pradesh	0.30	0.53
Maharashtra	0.27	0.82
Orissa	0.31	0.80
Punjab	0.28	Neg.
Rajasthan	0.13	0.13
Tamil Nadu	0.09	0.50
Uttar Pradesh	0.30	0.29
West Bengal	0.41	0.36
All India	0.51	0.50

Source : Source: Rao, Ray and Subbarao (1988).

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