

PURE RISK PREMIUM FOR CROP INSURANCE

ABINAYA P.

A project report submitted to the

Madras School of Economics

In partial fulfillment of the requirement for the award of the

Post Graduate Diploma

in

ACTUARIAL ECONOMICS



MADRAS SCHOOL OF ECONOMICS

Gandhi Mandapam Road, Kotturpuram,
Chennai – 600 025, INDIA

May 2010

Abstract

Government run crop yield insurance scheme is a major instrument being used to protect the Indian farmer from crop failures. However, these crop insurance schemes suffer from adverse selection and moral hazard problems because of the usage of flat rates. Given the current levels of yield and rainfall variability the actuarially fair premium rates are likely to be high and in many cases unattractive or unaffordable. So, instead of adopting the easy and unsustainable route of large subsidies, in the long term the government should consider risk mitigation through improvements in the irrigation and water management infrastructure. However, actuarial premium rates will show a clear picture of the reserves that will be available in the long term, for addressing the problem of crop failure and the vulnerability of farmers to this problem. When these rates cross a certain level, serious steps could be taken by the government towards investment in irrigation infrastructure and other agricultural risk management strategies. We follow a parametric approach to the estimation of probability densities for yield distribution and apply the formula $\text{Prob}[x < \lambda\mu] [\lambda\mu - E(x|x < \lambda\mu)]$, where x is the realized yield, λ is the coverage level and μ is the guaranteed yield to find the premium in terms of yield (kg/hectare) for a fixed guaranteed yield.