

MIXED CROPPING AS A RISK MITIGATION STRATEGY ON KERALA'S AGRICULTURAL SECTOR

By

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Abstract

Agriculture bears unpredictable outcome. Crop failure puts farmers in distress. As a remedial measure, the farmers concentrate on the cultivation of two or more crops simultaneously. Sustainability of agriculture requires profitability and competitiveness. This will enhance the quality of products and resource utilisation. Mixed cropping is a cropping system in agriculture of sowing two or three crops simultaneously on the same field. This will reduce crop failure. The present article examines the role of mixed cropping in mitigating agricultural risks and promoting sustainable agricultural practices.

Keywords: mixed cropping, crop failure, agriculture risk, and risk mitigation.

Introduction

In Kerala economy, the pattern of growing two or more crops together on the same piece of land can be seen as common among small-holder agriculture in Kerala. In this technique, the seeds are mixed before sowing in the field and there are no set patterns or columns are used. The crops used in the cultivation are sown at the same time period and same significance or emphasis is given to all crops. The sown crops have same life cycle and

also they have the same maturation period.

Review of Literature

Plieninger, T., Hochtl, F., Spek, T. (2006) Low nutrient inputs and relatively low output per hectare are the two common characteristics of most of the traditional land-use. Due to extensification and land abandonment or intensification, many traditional land-use systems have been lost or diminished in past decades. And also

the remaining traditional land-use systems continue to be at risk.

Sujatha, S., Bhat, R., Balasimha, D., & Apshara, E. S. (2011) In organic agriculture, mixed farming system plays a major role as the intermediary between the utilization of crop residues or fodder produced at the farm and the return of manure as nutrients. The suitable systems vary from region to region as per the local need and the climate. In coastal region the successful system involves arecanut, black pepper, cocoa and banana. In plain region the system includes arecanut, black pepper/betel vine, banana, lemon and tapioca. A judicious mix of cropping systems with associated enterprises like dairy would bring prosperity to the arecanut farmer.

Sawe, J. (2022) Mixed cropping is still a practical farming system in response to climate change due to various potentials associated with it, including: crop insurance, improvement of soil fertility, assurance of crop production, and minimization of pests and diseases that attack crops. Not all farmers were practicing the mixed crop farming

system due to various impediments, such as the impact of Western farming knowledge, and the lack of education and information about the usefulness of mixed cropping in response to climate change. Mixed cropping as a traditional farming system is still viable, appropriate and a game-changer in dealing with climate change.

Research Methodology

The study adopts a descriptive-analytical design that examines the patterns, determinants and outcomes of mixed cropping systems across Kerala using secondary data. Data collected from different journals, articles and working papers are used in the study. By relying on secondary data, the research is on a broad spatial and temporal scope that would be difficult to achieve through fieldwork alone.

Economic impact of Mixed cropping

When a farmer plants different combination of crops such as tapioca with paddy, or coconut with pepper, he can earn from different harvest times

and market prices. The can reduce the risk of financial loss through this method of one crop fails due to disease, excess rain or a price fall, the revenue can be generated through the other crop. Even the studies from Kerala's department of Agriculture show that farms practicing mixed cropping earns 15-25% higher net returns per hectare than the farms cultivating single crop. This might be that the farmer can sell and earn income at different seasons from the extra crop produced.

Farmers in Kerala have given more importance to commercial crops than food crops. The pattern of cropping commercial crops along with the food crops can be seen in Kerala. This pattern is followed by small scale agricultural producers to large scale agriculturists. The cultivation of Pepper, cardamom, rubber, coconut, areca nut, coffee along with rice, Tapioca, Chilli, Bitter guard, Radish, Cucumber, Pumpkin, Brinjal etc.

In Kerala, mostly we can see the cultivation of pepper along with coconut, areca nut. Pepper is a type of climbing vine plant which usually becomes as tall as coconut but the

farmers reduce the height to four meters by pruning because this helps the farmers in harvesting the coconuts without making any damage to the pepper vine. Coconut and areca nut can be cultivated as mono crops but it provides employment and income only for a part of the year and farmers have to rely upon other jobs or to remain unemployed. Mixed cropping in areca nut and coconut gives considerable scope in increasing the productivity per unit of area, production and efficient utilization of resources (CPCRI, 2011).

Enhancement of Agricultural productivity

In mixed cropping the farmers can efficiently use the soil and water for cultivation. Farmers cultivate Banana, Yam, Colocasia, Ginger, Turmeric along with Legumes which are rich in nitrogen and thus the soil receives the nitrogen and it is helpful for the growth of other crops. Different crops requires different levels of nutrients. This type of cultivation helps the farmer to make good yield with more productivity per unit of area comparing to that of the cultivation of

the mono crop. The irrigation and fertilizers can be used effectively in mixed cropping.

In this type of cultivation, if one crop fails due to the insufficiency of nutrients and the shortage of the water, the other crops will provide adequate nutrients and reduces the risk of crop failure. So the farmers should have to make right decision regarding the choice of crops cultivated to make the soil fertile. If same crops are cultivated for years without any change then the fertility of the soil will decline. The reduction in soil fertility can be improved by cultivating mixed crops because certain crops like legumes are rich in nitrogen and this will be stored into the soil and which can be used by other crops. The possibility of pest damage on crops can be reduced if they cultivate different crops simultaneously because the spread of pest can be either reduced or diluted under these circumstances.

In the uplands of Kerala, we can see the cultivation of pepper along with rubber plantations and coffee plantations. Dengle Yuniyus Giroh,

Yustus Sunday Francis and Ephram Ibrahim Jen (2011) analysed that the mixed cropping of rubber plantation along with other crops like banana, plantain, cassava and maize are cultivated by the farmers not only for satisfying the household food or subsistence but also as the income source for farmers.

The diverse needs of the farmers such as cash, food, fruits, vegetables and timber can be met by considering the cultivation of mixed cropping in same land. The farmers can reduce the time spent on each crop in mixed cropping rather than in the mono cropping, they can use their efforts simultaneously for the production of crops. The use of water for irrigation can also be much effective because different types of crops required different moisture level. Certain crops required comparatively lesser water.

The farming is beneficial only if the farmers receive good return from their farm; in this type of cultivation the farmers can get variety of produce. The crops cultivated have different duration; some have long duration while some crops have short duration.

The harvesting periods of the crops are different. Due to the different periods of harvesting, the farmers can collect the yield in different time periods, so they will get returns from their farm different time. Thus mixed cropping become profitable to the farmers.

Economic diversification and Risk mitigation

The risk of crop failure and loosing of huge financial crisis can be avoided by the type of mixed cropping because a variety of crops are simultaneously cultivated and if any type of crops fails, the farmer can yield benefit from other crops. And also the possibility of crop destruction is low because crop loss due to heavy rain and climate variation can be reduced by mixed cropping. Some crops requires high moisture content and others require only less, so the roots of plants requiring more water adapt excess water from the soil and reduces the risk of crop failure during rain and provides moisture and nutrient to other crops during the time of hot climate.

Mixed cropping is suited for small-scale farmers. Mixed cropping

improves the production and the income generation of the farmers because mixed cropping helps the farmers to reduce the problem of crop failure and further financial crisis. If any on crops fails, the yield from other crops generate income to the farmers.

In mixed cropping, different crops respond differently to temperature, rainfall and humidity. When one crop suffers, the other one may still produce a harvest, so the farm's total output will not be affected to extreme weather or to a climate change.

Tall canopy crops like coconut, banana provides shade to shorter, shade-prefering plants like pepper, ginger and also lowers the soil temperature and reduces evaporation. The moderate temperature and moisture can lessen heat stress and water-deficit impacts.

By integrating different crops with differing climatic tolerance, growth cycles and market value, farmers can reduce the dependence on single harvest and cushion the financial impact of extreme weather shock, pests or price shocks. This practice

also enhances the soil health, improves water retention, and create a more favorable micro-climate, further strengthening resilience against climate variability.

Conclusion

Mixed cropping practices can contribute to more stable incomes,

lower vulnerability to crop failure, and a more robust agricultural economy for Kerala when the farmers get support through appropriate policy measures and training. While Mixed cropping pattern doesn't eliminate climate risk completely, it can reduce substantially the likelihood of total crop failure and the associated economic shock.

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