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Relationship between independent variables and Yield gap among coconut growers

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Abstract—*The current study used an ex-post-facto research approach to investigate the factors impacting the yield gap of coconut producers in the Tumkur district of Karnataka in 2022–2023. Tumkur was specifically chosen because it is one of the state's top coconut-growing regions. Because of their differing levels of output, four of the district's 10 taluks namely Tiptur, Turuvekere, Chikkanayakanahalli and Sira were selected. Thirty coconut farmers from each of the specified taluks made up the total of 120 respondents, who were selected at random. To ascertain the meaningful relationships or linkages between the yield gap and different independent variables, correlation analysis was utilized. In the relationship between independent variables and yield gap, it was found that education, management orientation, credit orientation, deferred gratification, scientific orientation were negatively related with yield gap at one per cent level of significance whereas innovativeness, land holdings were negatively related with yield gap at five per cent level of significance. While age, family size, farming experience, information seeking behaviour, extension participation, risk orientation, cosmopoliteness were non-significant with respect to yield gap.*

Keywords— ***Coconut growers, Independent variables, Relationship, Yield gap, Tumkur***

I. INTRODUCTION

In the context of agricultural development, improving crop productivity remains a central goal, especially in regions where the potential yields are not fully realized by farmers. Coconut cultivation holds significant economic and cultural value in many parts of India, particularly in Karnataka, where it contributes substantially to rural livelihoods and the state's agricultural output. Despite the crop's importance, many farmers continue to face a persistent yield gap—the difference between the potential yield and the actual yield realized on the field and it is a critical area of concern, as it directly impacts farm income, resource efficiency and food security. Understanding the underlying factors contributing to this gap is essential for enhancing productivity, improving resource utilization and increasing farm incomes. Investigating these relationships is vital, as yield gaps are often influenced not just by agronomic practices, but also by a complex interplay of socio-economic, psychological and infrastructural factors. By examining these linkages, the study seeks to uncover actionable insights that can guide policy makers, agricultural extension services and development agencies in formulating strategies to bridge the yield gap, thereby fostering more efficient and sustainable coconut farming systems.

II. MATERIALS AND METHODS

The current study used an ex-post-facto research approach to investigate the factors impacting the yield gap of coconut producers in the Tumkur district of Karnataka in 2022–2023. Tumkur was specifically chosen because it is one of the state's top coconut-growing regions. Because of their differing levels of output, four of the district's 10

taluks namely Tiptur, Turuvekere, Chikkanayakanahalli and Sira were selected. Thirty coconut farmers from each of the specified taluks made up the total of 120 respondents, who were selected at random. To ascertain the meaningful relationships or linkages between the yield gap and different independent variables, correlation analysis was utilized. Fourteen attributes like the Age, Education, Family size, Land holding, Farming experience, Information seeking behaviour, Extension participation, Management orientation, Risk orientation, Credit orientation, Innovativeness, Deferred gratification, Scientific orientation and Cosmopoliteness were selected as independent variables in the study and Yield gap was selected as one of the dependent variables in the study. The index developed by Nagaraj (1999) [1] was used for understanding the Yield gap which refers to the percentage of the yield potential realized i.e., Yield gap refers to the difference between the potential yield of the coconut palm obtained at the research station and coconut grower's actual yield.

III. RESULTS AND DISCUSSION

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In the relationship between independent variables and yield gap as shown in table 1, it was found that education, management orientation, credit orientation, deferred gratification, scientific orientation were negatively related with yield gap at one per cent level of significance whereas innovativeness, land holdings were negatively related with yield gap at five per cent level of significance. While age, family size, farming experience, information seeking behaviour, extension participation, risk orientation, cosmopoliteness were non-significant with respect to yield gap which might have no influence on the productivity and yield gap. In a similar type of study by Sunil (2007) [2], Age had negative but non-significant relationship with the yield gap in high yielding varieties of paddy cultivation in Mandya district.

Education: Coconut growers with lower levels of education might have less access to information, lower analytical skills and a lesser capacity to adopt modern agricultural practices. This might have influenced to the lower yields, contributing to a more yield gap.

Management Orientation: Individuals with low management skills tend to make inferior decisions about resource allocation, crop management and risk mitigation. Poor management could have led to improper agricultural practices and consequently, increased yield gaps.

Credit Orientation: Lower willingness to use credit could pulled back coconut growers with the means to invest in inputs, equipment and technologies that could have dwindled productivity, resulting in lower yields and significant level of yield gap.

Deferred Gratification: Unawareness about long-term benefits over immediate gains are likely to reduce putting effort and resources into improving their farming practices. This can lead to lower productivity and significant yield gaps over time.

Scientific Orientation: If Coconut growers lack scientific knowledge then it can retard growers to adopt evidence-based practices that increase yields and widen the gap between potential and actual yield.

Innovativeness: Lack in innovativeness can lead to lesser chances in adopting new technologies and practices. This can result in inefficiency and unproductivity, leading to bigger yield gaps.

Land Holdings: Larger land holdings could have made growers difficult to concentrate on the entire plot, making them hard to implement better farming practices. This can contribute to loss in yields and increased yield gap. In a similar type of study by Sunil (2007) [2], land holding was found to be positively significant at 5 per cent level with the yield gap in high yielding varieties of paddy cultivation in Mandya district.

Table 1: Relationship between independent variables and Yield gap among coconut growers (n=120)

Sl. No.	Independent variable	Correlation co-efficient (r)
1	Age	0.043NS
2	Education	-0.305**
3	Family Size	0.093NS
4	Land-holdings	-0.209*
5	Farming experience	-0.085NS
6	Information seeking behaviour	-0.013NS
7	Extension participation	-0.078NS
8	Management orientation	-0.257**
9	Risk orientation	-0.109NS
10	Credit orientation	-0.253**
11	Innovativeness	-0.193*

12	Deferred gratification	-0.267**
13	Scientific orientation	-0.283**
14	Cosmopoliteness	-0.076NS

*=5% level of significance, **=1% level of significance and NS=Non-significant

IV. CONCLUSION

The findings of the study reveal that several behavioural and socio-economic factors have a significant influence on the yield gap in coconut cultivation. So, it becomes imperative to explore the relationship between independent variables and the yield gap more deeply. Such an understanding can guide agricultural extension services, policymakers and development practitioners in designing targeted interventions that address the specific behavioural and structural constraints faced by the farmers. Thus, by promoting education, scientific thinking and access to resources, efforts to bridge the yield gap can be made more effective, ultimately contributing to higher productivity and improved livelihoods in the coconut-growing communities.

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