International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 6, Nov.-Dec., 2024, pp: 844-851 ISSN: 3048-6874
www.ijhssm.org

Analysis the variance of S-10 in Rice production management

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Date of Submission: 02-12-2024 Date of Acceptance: 11-12-2024

Abstract:
The study portrays the Rice Production management elements which has a major role for the development of food production of unit as 96 household engaged in the agricultural food production in Cachar district under the study. which has a major role for the development of food production. In general, kharif rice varieties like Ranjit, Sarna Sali, SarnaMasuri Bahadur and Biron (sticky rice) cultivated in the district. The variety of the crop's cultivation depends on the topographical conditions of the land as well as time factor of the harvesting period. Rice is the main crops in North East India in Assam which accounts for more than 90% of the total food crop in the state. About 84% farmers are small and marginal and regions cultivation depends on Monsoon and natural rain. There is no irrigation facility to the area. Farmers no longer to continue Rabi crops due to heavy texture with high percentage of clay, soil acidity, nutrient. The technique of production, the S-10 is the key role which discussed in the following i.e. seed, sink, sprout, shower, seedlings, sludge, sow, sap, sack and sale etc.

Keywords: sprout, showers, seedlings, sludge,

I. Introduction:

Climate has an important influence on the nature of the natural vegetation, the characteristics of the soil, the crops that can be grown and the type of firming that can be practiced in any region. There are a number of diverse types of tropical climate and there is correspondingly great variation in the agricultural potential of different parts of tropics.[1]

A great improvement in the efficiency and productivity of agriculture is essential in most of the tropical developing countries if their rapidly increasing populations are to be provided with adequate food, employment and better standard of living. Nearly 70% of the people of these countries currently depend for a living on agriculture which, except in a few territories with substantial oil or mineral production, accounts on average for almost one third of the gross domestic product and for rather more than half of the total value of exports. Hence, agricultural development is not only needed to produce more food for domestic consumption, but also to provide exports to earn foreign exchange for the purchase of resources which imported for industrial development. Growing more raw materials for local manufacture may also be desireable.[2] In India Rice (Oriza sativa L) is grown in an area of 45 Mha annually with a production of 90 MT which accounts for 45%of food grain production in the country[3].

Agricultural management is an occupation that involves the science of the food production. It deals with farming techniques the domestication of animals and the general processing of food. there are many agricultural jobs that require management, especially on projects working in the scientific disciplines and with farm labour, with changing dynamics of global food production, this field is one of the fastest growing in the world. [4] It is the process of planning and implementing various tasks in farming to achieve efficiency and profitability. Every farm management approach and practice depend on the type of land, climatic conditions, seasons, farming needs of different types of crops and others.[5]

Having strategies in place to make sure things run effectively and efficiently.

Engaging in proactive (and reactive) management.[6] Agricultural labour is one, who is basically unskilled and unorganized and has little for its livelihood, other than personal labour- Natural Commission on labour all those persons who desire major part of their income as payment for work performed on the farms of others can be designated as agricultural workers.

Why agricultural labour management? The agricultural sector employs half of the world's labour force with an estimated 1.3 billion workers active in agricultural production world wide – working safety of agricultural workers as they are seriously injured in workplace accidents with agricultural machinery or poisoned by pesticides and other

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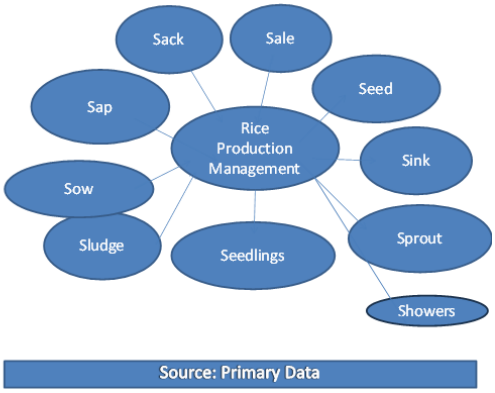
Agrochemicals- to bring maximum efficiency from the labourers- overall maximum profit.[7]



Source: Primary Data

II. Literature Review:

A large number of studies have been carried out on the agriculture sector and measurement of its productivity India. All these studies can be categorized into two group agriculture sector and other crops specific sector. These studies have been proved that Total Factor productivity growth of agriculture has been vital contributing for acceleration of Indian national income growth.

Tanhampoar and Mahamoud (2018) investigated the empirical model to evaluate the productivity growth in agriculture sector. the result has been found that average factor production growth rate is -0.72%and its share in value added is also negative -19.6% while it has estimated to be 33.8% in fourth development plan.

Alexanderi (2017) explained the labour productivity situation in Rumanian agriculture farms across regions. The results have been indicated that there are economic growth trends in west region and less obvious in North East region.

Ranga and Muruganandhan (2016) review the findings of various research works on the impact of farm mechanization on production, productivity, employment and gross income in agriculture sector. They found that different studies concluded that the farm mechanization increased more efficient utilization of inputs which lead to increase average cropping intensity and increase labour productivity.

Urgessa (2015) investigated the determinants of agricultural productivity and rural household income in Ethiopia. To examine the relationship between income and productivity panel data regression model used namely pooled OLS. Fixed and Random effect model and using socio-economic survey of 2011-12 to 2013-14.

Valerio (2014) analyzed how agricultural productivity of major crops namely rise, corn and coconut in the CALABARZON region has affected by using with extent of inputs. To estimate the data, he has used Cobb-Douglas function.

Kumar and Nain (2013) analyzed the strength and weakness, opportunities and threats to Indian agriculture. They found that the largest cultivable land with highly record production of food grains showed the strength of Indian agriculture. The main weakness of agriculture lies in large amount of harvest losses, low yields and less contribution in national GDP.

Todkari (2012) attempted to examine the impact of irrigation on agricultural productivity in Solapur district where rainfall is uncertain and inadequate. so, irrigation is necessary for successful agricultural production. The study is based on secondary data and Kendal's ranking co-efficient method to know agricultural productivity. He observed that there is high correlation between irrigation intensity and agricultural productivity, in five Tehsils in this region namely Pandharpur, Malshiras, Kamala, Barshi and Madha.

Doss (2011) gave empirical evidence to study on women role in agriculture. The participation of women in agriculture sector is clearly significant women comprise more than half of agricultural worker in many African and Asian countries but found out their contribution is much less in some reason. Although, their contribution in agriculture sector yet.

Shitter and Ashoaw (2010) examined pattern and determinants of agriculture labour productivity in west African region. The analysis revealed that agriculture productivity is positively affected higher education growing capital formation more irrigation and good quality fertility.

Dharmasiri (2009) attempted to format a dissimilar model for computing agriculture productivity. It is called average productivity. Index which can recognize spatial distribution pattern of productivity of a state or any country. There are two major components of API are average yield and harvested area related to select crops

Meijerink and Roza (2007) showed that agriculture is backbone in many developing countries for GDP growth and development. In recent years, there have been various changes in agriculture sector in developing countries. However, agriculture is fewer contributors in GDP as compare to non-agricultural sector. The nonagricultural sectors have higher productivity than economics were agriculture dominator.

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Kumar and Mittal (2006) examined sustainability issue of the Indian crop productivity from 1971 to 2000. A sustainable farming system is a system in which natural resources are managed in this way that potential yield and resources stock do not decrease overtime period. To compute the TFP indices for crops they have applied Divisia Tornqvist index. The results have shown that the obtained productivity growth during 1980's has not been sustained during in the 1990's.

It is observed from the review of above relevant studies and literature that no research study has been done on rice production management and S-10. therefore, propose study intends to provide a comprehensive study of agriculture labour using S-10 Concept which covering seed, sink, sprout, showers, seedlings, sludge, sow, sap, sack and sale.

III. Statement of the problem:

Continuous application of herbicides can lead to the selection of herbicide resistant species which can have negative economic and ecological consequences.[8] shortage of skilled personnel and lack of mechanization can lead to large amount of waste. There is a persistence shortage of labour in agriculture sector, especially in rural communities. This can make it difficult to resist and workers. It is important to run a farm with a firm budget as costs as quickly spiral out control. Farmers need to deal with the effects of climate change. Unpredictable weather conditions such as drought, floods can impact crop yields and livestock production. Mismanagement of irrigation can harm soil and crops too much irrigation can delay maturity and harvesting while too little can decrease yield and crop quality. Pests and diseases can hinder crop and animal productivity. They can cause of poor growth, high mortality and reduce productivity in animals. Soil erosion occurs when the top layer of soil is worn away or runs off with water or air. This can decrease soil fertility and lead to less crop yield. Farmers may not be able to get right price for their produce due to lack of genuine purchasers. A lack of adequate transportation can lead to wasted items and losses.

IV. Objectives of the study:

The main objectives of the study are:

1. To draw the characteristics of the rice production management.
2. To evaluate the growth and development of rice production management.
3. To identify the growing challenges and prospects.

V. Research Questions:

The proposed study aims to address the following questions:

1. What are the main characteristics of the study area?
2. What are the growth and development of the sector?
3. What are the prospects and challenges of the area?

VI. Methods and materials:

The proposed study is to explore and understand the various features of rice production management of Cachar district. The universe is all the rice cultivating household as a unit in Cachar district. The population 104,295 (2019-20) numbers of production household as unit by using sample size calculator, the sample size is found 96 at confidence level 10%. The area of study was conducted in Cachar district data analysis techniques descriptive statistics for analyzing the dependence data Chi-square exact test is used due to the reason that some of the cells are either zero or less than 5. The report presentation is using tables for easy grasping the findings.

VII. Result and Discussion:

Apart from the cultivators, agricultural productions are the others vitally involved in farming. The production is very large and is also rapidly growing. This is the life and death of abject poverty of farmers. They are the most backward; the most exploited as also the most neglected class of the rural economy. As such they require our urgent attention. Without a satisfactory solution of their problems, no real and durable progress can take place

Agriculture labour may be defined as labour, who works in agriculture or in activities allied to it for the whole or part of the year in return for wages (in cash or kind or both) for full-time or part-time work. This definition incorporates the present job situation in the agricultural sector. This sector, being underdeveloped, does not work for the whole year. Nor does it provide full time work to everyone.[6]

i)Seed

In Botany, a seed is a plant embryo and food reserve enclosed in a protective outer covering called a seed coat. more generally, the term "seed" means anything that can be sown which may include seed and husk or tuber. seeds are the product of the ripened ovule, after the embryo sac is fertilized by

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sperm pollen, forming a zygote and grows within the mother plant to certain size before growth is halted [7]

ii)Sink

While some sunken seeds will germinate and some floating seeds will fail to sprout, there isn't a strong correlation between buoyancy and viability. Generally larger seeds are better for this test than smaller ones. Therefore, they should not rely on the sink/ float test to determine which to discard and which to plant. [8]

Role of farm mechanization, technology in agriculture is no less important. We shall be learning about use of modern equipment and other such measures to increase the farm productivity and output, prevalence of extension services to educate farmers about the changing farm practices and their suitability in different contexts; impact of new production structure on the farm outputs, particularly about the success of green revolution in India. Along with this, we shall be discussing about the role of technology in agriculture.[6]

Seeds are sunken for the sprout and sprouted seeds showering on sludge or sap soil from the sprouted seeds rapidly are grown seedlings of paddy crop.

Table:1: -Seed for Sink

Sink	Seed			Total
	Local	Traditional	hybrid	
Partial	2	15	0	17
Traditional	22	30	21	73
New-system	6	0	0	6
Total	30	45	21	96

(Source: Primary Data)

From the above Table, it is found that seed respondents of Locals category involve on every category of Sink respondent on the other hand traditional category of Sink respondent is the highest responded in the both respondents of Seed and Sink.

From the above findings, it is imperative to test whether Seed respondent depend upon the Sink respondent in Cachar district.

Hypothesis Testing

Null Hypothesis (H_0)

There is no significant relationship between the Seed respondent and Sink respondent in Cachar district.

Alternative Hypothesis (H_a)

There is significant relationship between the Seed respondent and Sink respondent in Cachar district

For testing the above hypothesis Chi-square (exact test)

Table:2 Chi-Square Tests

Pearson Chi-square	Value	df	Exact sig(Two sided)
	34.279	4	0.000

Test Result of SPSS Software

Since the P –value (=0 .000) < 0.05, the Chi- square critical value x^2=34.279 is significant. Hence, Null hypothesis (H_0) is rejected and Alternative hypothesis (H_a) is accepted. That is, there is a significant relationship between Seed respondent and Sink respondent. In conclusion that Seed respondent depend upon the Sink respondent.

iii)Sprout

Sprouting is the natural process by which seeds or spores germinate and put out shoots and already established plants produce new leaves or buds or other structures experience further growth. Mixed bean sprouts (shoots) Melon seeds sprouting buckwheat sprouts.[9]

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Volume 4, Issue 6, Nov.-Dec., 2024, pp: 844-851 ISSN: 3048-6874
www.ijhssm.org

Table :3 Sprout of seed

Sprout	Seed			Total
	Local	**Traditional**	**Hybrid**	
Partially	1	0	0	1
Fully	25	45	2	72
Medium level	03	20	0	23
Total	29	65	2	96

Source: Primary Data

It is revealed from the above table that the highest numbers of Sprout respondents under fully Category whereas traditional category is the second largest respondent under Seed respondent

From the above findings, it is imperative to test whether Seed respondent depend upon the Sprout respondent in Cachar district.

Hypothesis Testing

Null Hypothesis (H_0)

There is no significant relationship between the Seed respondent and Sprout respondent in Cachar district.

Alternative Hypothesis (H_a)

There is significant relationship between the Seed respondent and Sprout respondent in Cachar district

For testing the above hypothesis Chi-square (exact test)

Table:4 Chi-Square Tests

Pearson Chi-square	Value	df	Exact sig (Two sided)
	165.168	4	0.000

Test Result of SPSS Software

Since the P –value (=0. 000) < 0.05, the Chi- square critical value x^2=165.168 is significant. Hence, Null hypothesis (H_0) is rejected and Alternative hypothesis (H_a) is accepted. That is, there is a significant relationship between Seed respondent and Sprout respondent. In conclusion those Seed respondents are depended upon the Sprout respondent.

iv)Shower

Sprout Seed showering is a process which apply in paddy cultivation in traditional areas. The sprouted seeds after touching the sludge soil after few days it is grown as seedlings.

v)Seedlings

A seedling is a young sporophyte developing out of a plant embryo from a seed. Seedling development starts with germination of the seed. A typical young seedling consists of three main parts: the radicle, the hypocotyl and the cotyledons. [10]

Table:5 Showers for seedlings

Seedlings		Showers			Total
		Traditional	Mordern	Expert guidance	
	Traditional	10	34	0	44
	Mordern	34	0	7	41
	Expert guidance	0	0	11	11
Total		44	34	18	96

Source: Primary Data

It is seen from the above table that Traditional category is the highest number of respondents in both Showers and Seedlings on the other hand expert guidance is the lowest number of respondents under Seedlings respondent and Showers respondent.

From the above findings, it is imperative to test whether Showers respondent depend upon the Seedlings respondent in Cachar district.

Hypothesis Testing

Null Hypothesis (H_0)

International Journal of Humanities Social Science and Management (IJHSSM)
Volume 4, Issue 6, Nov.-Dec., 2024, pp: 844-851 ISSN: 3048-6874
www.ijhssm.org

There is no significant relationship between the Showers respondent and Seedlings respondent in Cachar district.

Alternative Hypothesis (H_a)

There is significant relationship between the Showers respondent and Seedlings respondent in Cachar district

For testing the above hypothesis Chi-square (exact test)

Table:6 Chi-Square Tests

Pearson Chi-square	Value	df	Exact sig(Two sided)
	109.698	4	0.000

Test Result of SPSS Software

Since the P –value (=0 .000) < 0.05, the Chi- square critical value x^2=109.698 is significant. Hence, Null hypothesis (H_0) is rejected and Alternative hypothesis (H_a) is accepted. That is, there is a significant relationship between Showers and Seedlings. In conclusion that showers respondents depend upon the Seedlings.

vi)Sludge

Sludge soil is soil that has been amended with sewage sludge, a semisolid waste product from wastewater treatment plants. Sludge can be a useful soil amendment because it contains nutrients and organic matter that improve soil. However, it can also contain contaminants and pathogens that can be harmful to the environment and human health[11]

vii)Sow

When you plant seeds in the ground, you sow them. you can also sow things like doubts or ideas, simply spreading them around.[12]

Table:7: Sludge for Sow

Sow	Sludge			Total
	Partially	Fully	Expert guidance	
Traditional	0	35	0	35
Modern	0	34	0	34
Expert guidance	9	11	7	27
Total	9	80	7	96

Source: Primary Data

From the above table it is found that fully category under Sludge respondent is the highest respondents. whereas Traditional category under Sow respondent is the second largest respondents' Expert guidance category is the lowest respondents under Sludge respondents.

From the above findings, it is imperative to test whether Sludge respondent depend upon the Sow respondent in Cachar district.

Hypothesis Testing

Null Hypothesis (H_0)

There is no significant relationship between the Sludge respondent and Sow respondent in Cachar district.

Alternative Hypothesis (H_a)

There is significant relationship between the Sludge respondent and Sow respondent in Cachar district

For testing the above hypothesis Chi-square (exact test)

Table:8: Chi-Square Tests

Pearson Chi-square	value	Df	Exact sig (Two sided)
	49.067	4	0.006

Test Result of SPSS Software

Since the P –value (=0 .006) >0.05, the Chi- square critical value x^2=49.067 is significant. Hence, Null hypothesis (H_0) is accepted and Alternative hypothesis (H_a) is rejected. That is, there is no significant relationship between Sludge respondent and Sow respondent. In conclusion that Sludge respondents are not depend upon the Sow respondent.

viii)Sap

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Volume 4, Issue 6, Nov.-Dec., 2024, pp: 844-851 ISSN: 3048-6874
www.ijhssm.org

It is a process which apply and use in cultivation for sowing the seedlings. After uprooting the seedlings sow on the sap soil. This process is maintained by the farmers of paddy cultivation in traditional area like Northeastern region of India.

Table: 9: Sap for Sow

Sow	Sap			Total
	Partially	Fully	Expert guidance	
Traditional	0	73	0	73
Mordern	9	7	1	17
Expert guidance	0	0	6	6
Total	9	80	7	96

Source: Primary Data

It is revealed from the above table that Fully is highest category under Sap respondent whereas Traditional category is the second largest under Sow respondent. Expert guidance category is the lowest respondent under both respondents Sap and Sow.

From the above findings, it is imperative to test whether Sap respondent depend upon the Sow respondent in Cachar district.

Hypothesis Testing

Null Hypothesis (H_0)

There is no significant relationship between the Sap respondent and Sow respondent in Cachar district.

Alternative Hypothesis (H_a)

There is significant relationship between the Sap respondent and Sow respondent in Cachar district

For testing the above hypothesis Chi-square (exact test)

Table:10: Chi-Square Tests

Pearson Chi-square	Value	Df	Exact sig (Two sided)
	128.975	4	0.000

Test Result of SPSS Software

Since the P –value (=0 .000) < 0.05, the Chi- square critical value x^2=128.975 is significant. Hence, Null hypothesis (H_0) is rejected and Alternative hypothesis (H_a) is accepted. That is, there is a significant relationship between Sow respondent and Sap respondent. In conclusion those Sap respondents depend upon the Sow respondent.

ix)Sack

A sack usually refers to a rectangular shaped bag. sack may also refer to: Bag. a large bag made from a rough heavy material, paper or plastic, used for carrying or storing things. [13] the produced crop is required to packed and saved from the animals and thieves.

x)Sale

A transaction that includes an exchange of services or goods for a certain amount of money is known as a sale. In other words, any activity that involves transferring the ownership of a good or commodity to the buyer in exchange for a monetary price is known as a sale.[14]

Table no:11-Sacks for sale

Sack	Sale			Total
	Survival	Profit	Business	
Old sack	5	12	5	22
New sack	22	3	11	36
Expert guidance	0	34	4	38
Total	27	49	20	96

Source: Primary Data

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Volume 4, Issue 6, Nov.-Dec., 2024, pp: 844-851 ISSN: 3048-6874
www.ijhssm.org

It is seen from the above table that profit category is the highest respondent under Sale respondent on the other hand Survival category is the second highest under Sale respondent. Old Sack category is the lowest respondent under Sack respondent.

From the above findings, it is imperative to test whether Sack respondent depend upon the Sale respondent in Cachar district.

Hypothesis Testing

Null Hypothesis (H_0)

There is no significant relationship between the Sack respondent and Sale respondent in Cachar district.

Alternative Hypothesis (H_a)

There is significant relationship between the Sack respondent and Sale respondent in Cachar district

For testing the above hypothesis Chi-square (exact test)

Table:12: Chi-Square Tests

Pearson Chi-square	Value	Df	Exact sig(Two sided)
	52.366	4	0.007

Test Result of SPSS Software

Since the P –value (=0 .007) >0.05, the Chi- square critical value x^2=52.366 is significant. Hence, Null hypothesis (H_0) is accepted and Alternative hypothesis (H_a) is rejected. That is, there is no significant relationship between Sack and Sale. In conclusion those Sack respondents are not depended upon the Sale respondents.

VIII. Conclusion

In conclusion that Seed respondent depend upon the Sink respondent. Seed respondents are depended upon the Sprout respondent. The showers respondents are depended upon the Seedlings. The Sludge respondents are not depending upon the Sow respondent. In conclusion those Sap respondents depend upon the Sow respondent. In conclusion those Sack respondents are not depended upon the Sale respondents.

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