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RESEARCH ARTICLE

DESIGN AND DEVELOPMENT OF SUSTAINABLE AGRICULTURAL PRACTICE WITH SPECIAL REFERENCE TO NADIA DISTRICT, WEST BENGAL

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ABSTRACT:

Sustainable agriculture refers to the use of farming methods and practices that protect or enhance the base of natural resources, other ecosystems that are influenced by agricultural activities, and the financial sustainability of agricultural production. Agriculture is sustainable when it is based on a thorough scientific understanding and is accepted in the marketplace, society, and culture. Sustainable development is defined as the direction of institutional and technological advancement along with the management and maintenance of the natural resource base. By taking these steps, the requirements of present and future generations will be met. In this article; design and development of sustainable agricultural practice with special reference to Nadia District, West Bengal has been discussed.

KEYWORDS: Agriculture, Productivity, Nadia.

INTRODUCTION:

Agriculture depends on its natural environment. The only method to conserve water is to look into the possibilities of using groundwater and surface water resources, which requires rainfall. [1] Drainage is the supply of high-quality water for irrigation in the farming industry. The intensity of irrigation system utilization depends on the available water for various crops grown in different regions. [2-4] The physical atmosphere and agriculture are closely intertwined, and changes in the atmosphere will unavoidably impact how agricultural land is used. [5–6] Although it has long been known that temperature differences indirectly affect how agricultural land is used, slope gradients also limit agriculture and partially explain variations in soil and climate on different slope faces. [7]

RESEARCH METHODOLOGY:

Study Area: Nadia district, West Bengal.

Sampling Plan: Simple random sampling.

Sample Size: 300.

Data Source: Primary data.

Methodology:

I was visited the selected areas in Nadia district, West Bengal for collecting the sample size. The sample belongs to farmers and related to their family members (specifically familiar to the work). The questionnaire sheets were distributed in favour of the respondents after clearing the research objectives. Sufficient time was given in favour of the respondents. After completion of their sheet, the sheet was collected for data analysis and interpretation.

Research Tools: Structured Questionnaire Schedule (5 Point Likert Scale).

Data Analysis and Interpretation: Pie chart.

DATA ANALYSIS, INTERPRETATION, RESULTS AND DISCUSSION:

Table 1. Age group of the respondents:

Type	Respondents	% of the respondents
Upto 30 years old	76	25.34
31-50 years	169	56.33
51 years and more old	55	18.33
Total	300	100

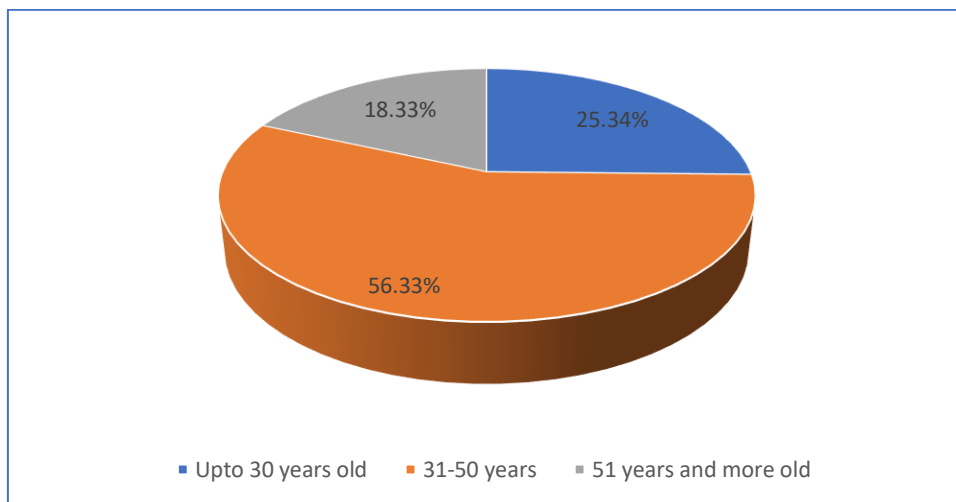


Figure 1. Age group of the respondents

From the above table and figure, it was found that up to 30 years old respondents were 25.34%, 31-50 years respondents were 56.33% & 51 years and more old respondents were 18.33%.

Table 2. Educational Qualifications of the respondents:

Type	Respondents	% of the respondents
Primary level	88	29.33
Secondary level	113	37.67
Higher secondary/Diploma level	52	17.33
Graduation level	39	13

More than graduation level	8	2.67
Total	300	100

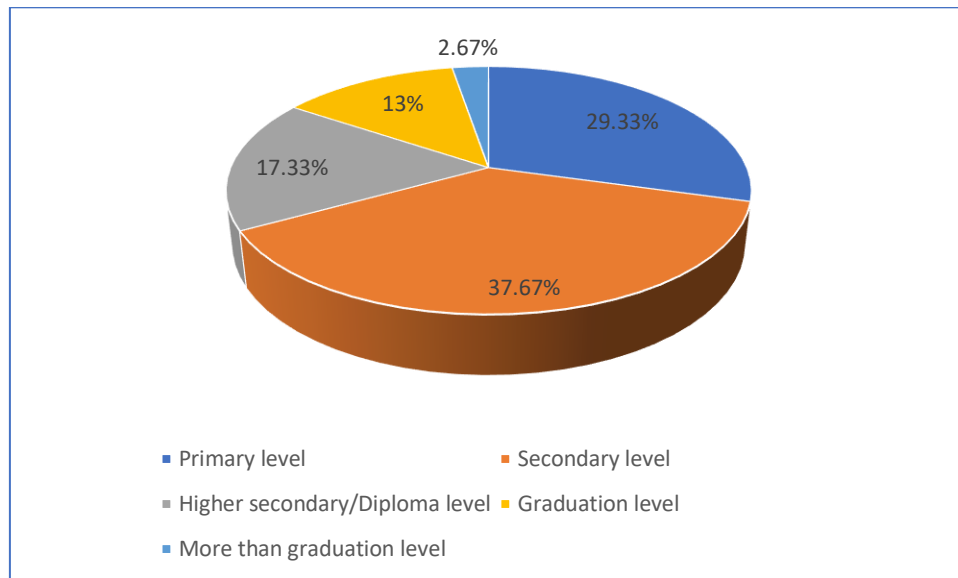


Figure 2. Educational Qualifications of the respondents

From the above table and figure, it was found that educational qualifications of the respondents belong to primary level 29.33%, secondary level 37.67%, higher secondary/diploma level 17.33%, graduation level 13% and more than graduation level 2.67%.

Table 3. Farmers with holdings within the size classes:

Type	Respondents	% of the respondents
Less than 1 hectare	77	25.67
1-2 hectare	106	35.33
2-4 hectare	79	26.33
Above 4 hectares	38	12.67
Total	300	100

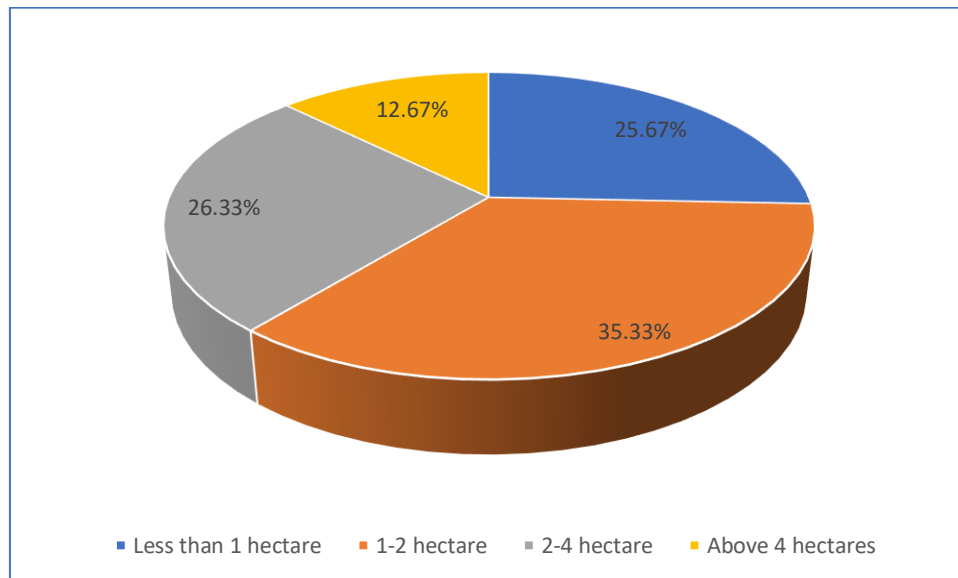


Figure 3. Farmers with holdings within the size classes

From the above table and figure, it was found that respondents belong to less than 1 hectare: 25.67%, 1-2 hectare: 35.33%, 2-4 hectare: 26.33% and above 4 hectares: 12.67%.

Table 4.: An advantage of sustainable agricultural practices is reduction in the use of chemical fertilizers

Statement	Options	Respondents	% of respondents
An advantage of sustainable agricultural practices is reduction in the use of chemical fertilizers.	Strongly Agree (SA)	33	11
	Agree (A)	65	21.67
	Undecided (U)	8	2.67
	Disagree (D)	102	34
	Strongly Disagree (SD)	92	30.66
	Total		300

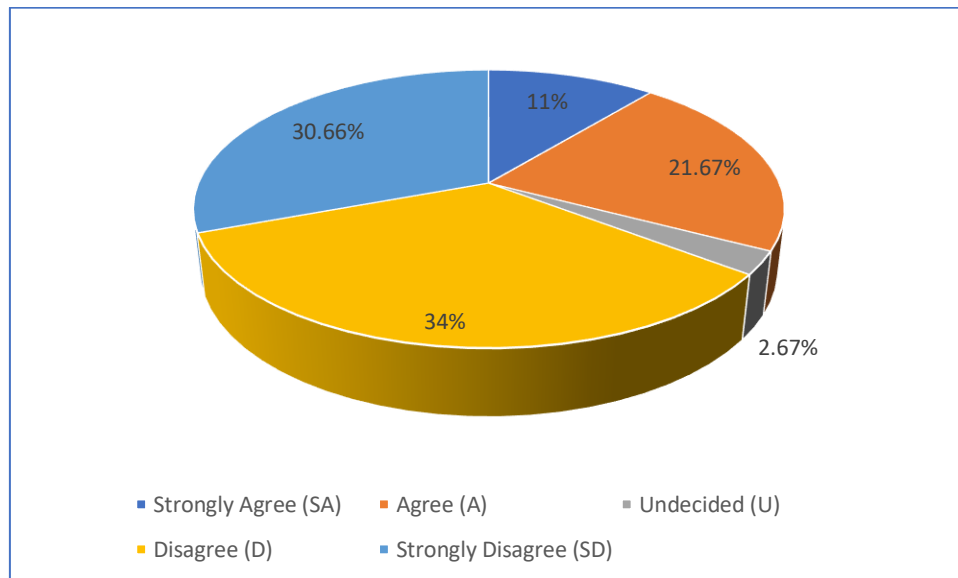


Figure 4. An advantage of sustainable agricultural practices is reduction in the use of chemical fertilizers

From the above table and figure, it was found that the respondents belongs to strongly agree: 11%, agree: 21.67%, undecided: 2.67%, disagree: 34% and strongly disagree: 30.66%.

Table 5.: Farmers in sustainable agriculture lives more in harmony with nature

Statement	Options	Respondents	% of respondents
Farmers in sustainable agriculture lives more in harmony with nature	Strongly Agree (SA)	44	14.67
	Agree (A)	93	31
	Undecided (U)	78	26
	Disagree (D)	64	21.33
	Strongly Disagree (SD)	21	7
	Total	300	100

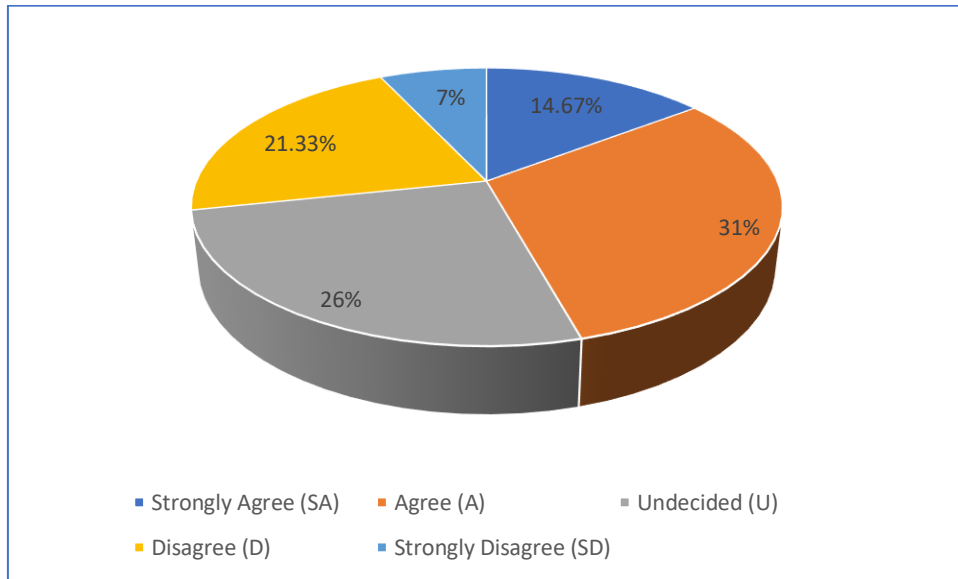


Figure 5. Farmers in sustainable agriculture lives more in harmony with nature

From the above table and figure, it was found that the respondents belongs to strongly agree: 14.67%, agree: 31%, undecided: 26%, disagree: 21.33% and strongly disagree: 7%.

Table 6. Economic gains when employing sustainable agricultural practices are not convincing

Statement	Options	Respondents	% of respondents
Economic gains when employing sustainable agricultural practices are not convincing	Strongly Agree (SA)	78	26
	Agree (A)	93	31
	Undecided (U)	6	2
	Disagree (D)	54	18
	Strongly Disagree (SD)	69	23
	Total		300

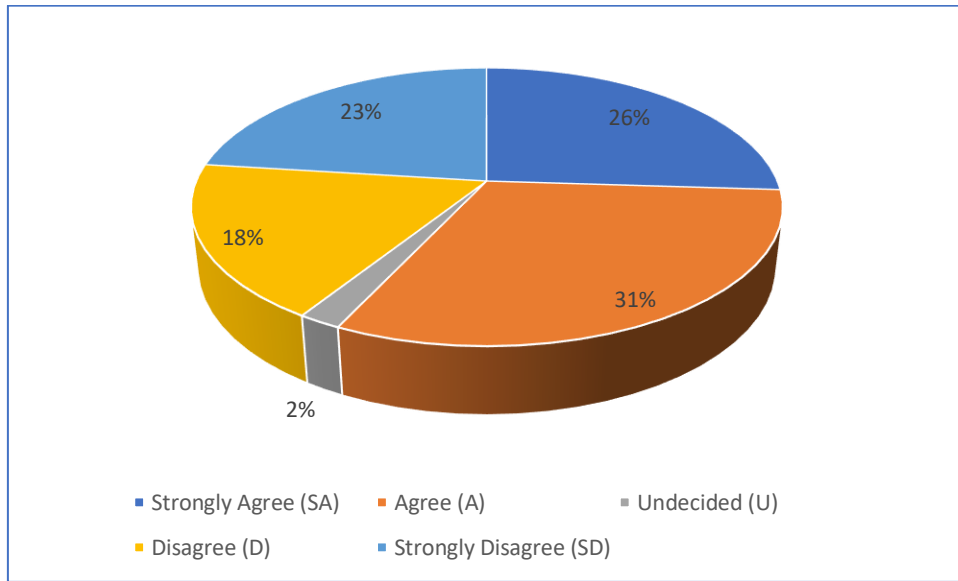


Figure 6. Economic gains when employing sustainable agricultural practices are not convincing

From the above table and figure, it was found that the respondents belongs to strongly agree: 26%, agree: 31%, undecided: 2%, disagree: 18% and strongly disagree: 23%.

Table 7. Net farm income may decrease when a producer implements sustainable agricultural practices

Statement	Options	Respondents	% of respondents
Net farm income may decrease when a producer implements sustainable agricultural practices	Strongly Agree (SA)	38	12.67
	Agree (A)	51	17
	Undecided (U)	6	2
	Disagree (D)	118	39.33
	Strongly Disagree (SD)	87	29
	Total	300	100

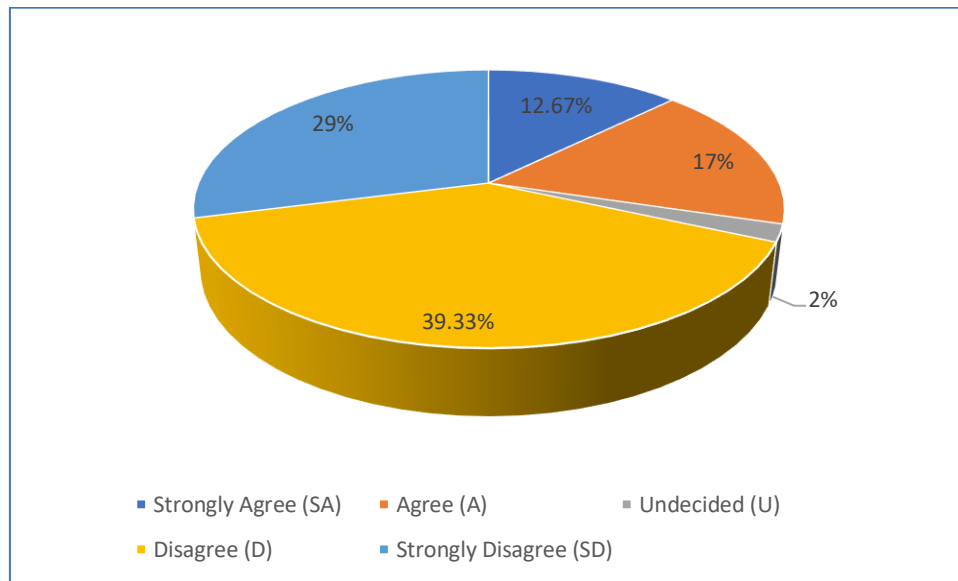


Figure 7. Net farm income may decrease when a producer implements sustainable agricultural practices

From the above table and figure, it was found that the respondents belongs to strongly agree: 12.67%, agree: 17%, undecided: 2%, disagree: 39.33% and strongly disagree: 29%.

Table 8. Sustainable agricultural systems can improve income on a farm

Statement	Options	Respondents	% of respondents
Sustainable agricultural systems can improve income on a farm	Strongly Agree (SA)	96	32
	Agree (A)	121	40.34
	Undecided (U)	3	1
	Disagree (D)	58	19.33
	Strongly Disagree (SD)	22	7.33
	Total	300	100

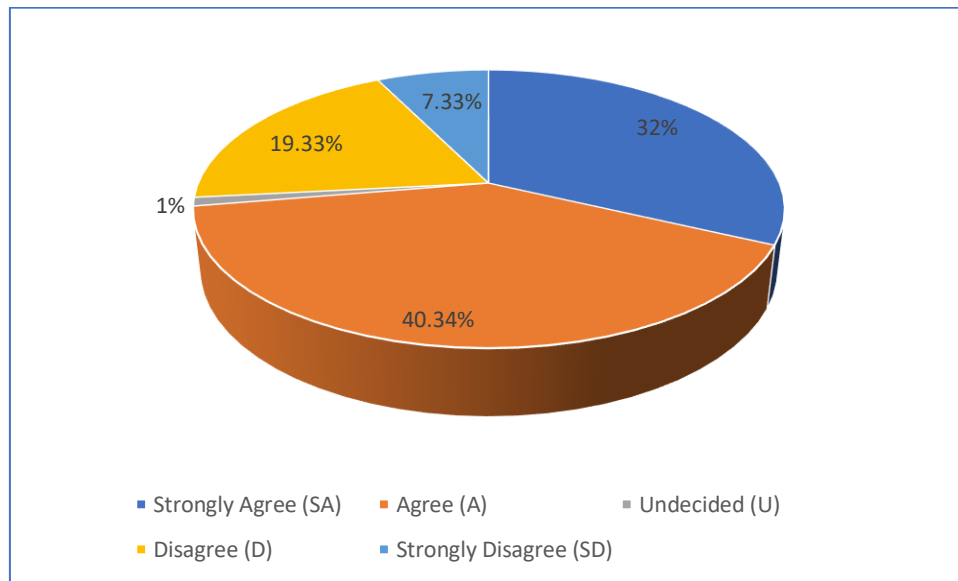


Figure 8. Sustainable agricultural systems can improve income on a farm

From the above table and figure, it was found that the respondents belongs to strongly agree: 32%, agree: 40.34%, undecided: 1%, disagree: 19.33% and strongly disagree: 7.33%.

Table 9. Sustainable agricultural practices would work well on any farm

Statement	Options	Respondents	% of respondents
Sustainable agricultural practices would work well on any farm	Strongly Agree (SA)	85	28.33
	Agree (A)	176	58.67
	Undecided (U)	4	1.33
	Disagree (D)	21	7
	Strongly Disagree (SD)	14	4.67
	Total	300	100

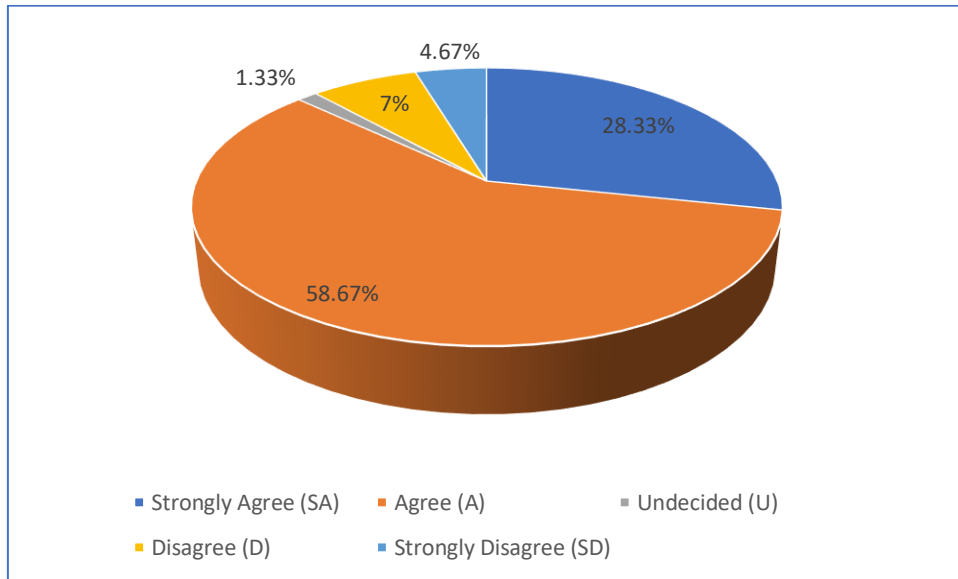


Figure 9. Sustainable agricultural practices would work well on any farm

From the above table and figure, it was found that the respondents belongs to strongly agree: 28.33%, agree: 58.67%, undecided: 1.33%, disagree: 7% and strongly disagree: 4.67%.

Table 10. Sustainable agricultural practices may require additional management beyond conventional practices

Statement	Options	Respondents	% of respondents
Sustainable agricultural practices may require additional management beyond conventional practices	Strongly Agree (SA)	96	32
	Agree (A)	101	33.67
	Undecided (U)	3	1
	Disagree (D)	64	21.33
	Strongly Disagree (SD)	36	12
	Total	300	100

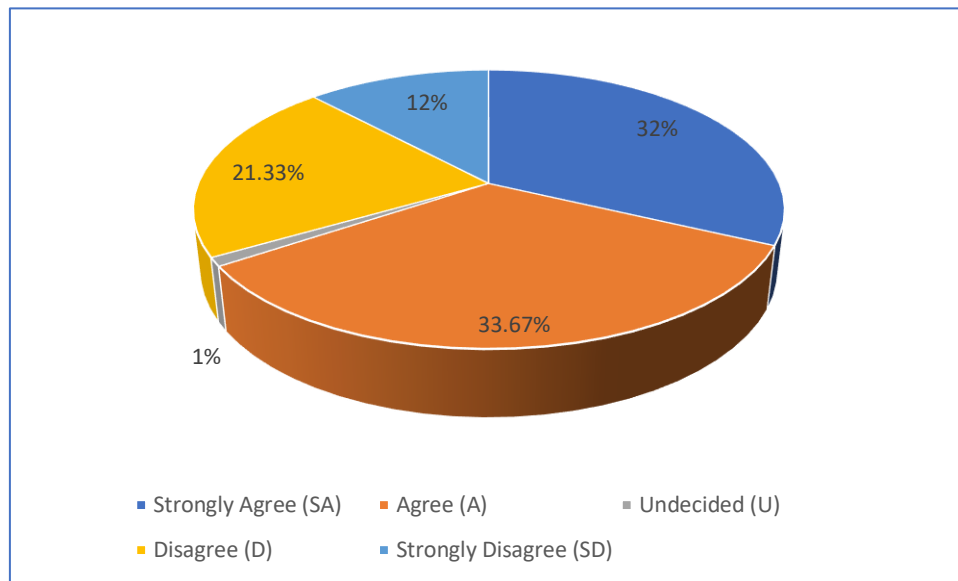


Figure 10. Sustainable agricultural practices may require additional management beyond conventional practices

From the above table and figure, it was found that the respondents belongs to strongly agree: 32%, agree: 33.67%, undecided: 1%, disagree: 21.33% and strongly disagree: 12%.

Table 11. The adoption of sustainable agricultural practices is slow because farmers lack the knowledge to implement them

Statement	Options	Respondents	% of respondents
The adoption of sustainable agricultural practices is slow because farmers lack the knowledge to implement them	Strongly Agree (SA)	89	29.67
	Agree (A)	113	37.67
	Undecided (U)	23	7.67
	Disagree (D)	40	13.33
	Strongly Disagree (SD)	35	11.66
	Total	300	100

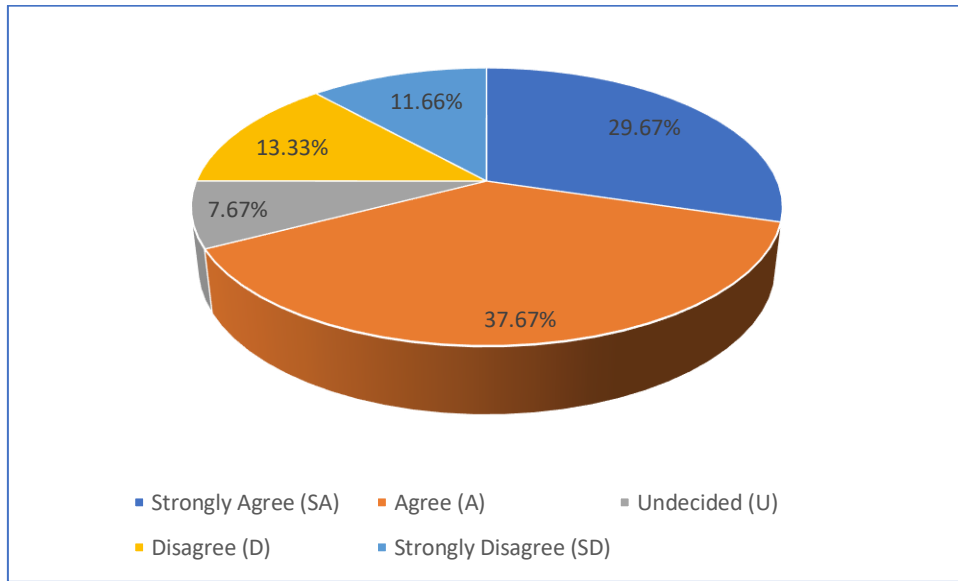


Figure 11. The adoption of sustainable agricultural practices is slow because farmers lack the knowledge to implement them

From the above table and figure, it was found that the respondents belongs to strongly agree: 29.67%, agree: 37.67%, undecided: 7.67%, disagree: 13.33% and strongly disagree: 11.66%.

Table 12. Recommended pest control methods for sustainable agricultural systems have potential for more pests in the long term

Statement	Options	Respondents	% of respondents
Recommended pest control methods for sustainable agricultural systems have potential for more pests in the long term	Strongly Agree (SA)	184	61.34
	Agree (A)	67	22.33
	Undecided (U)	4	1.33
	Disagree (D)	38	12.67
	Strongly Disagree (SD)	7	2.33
	Total	300	100

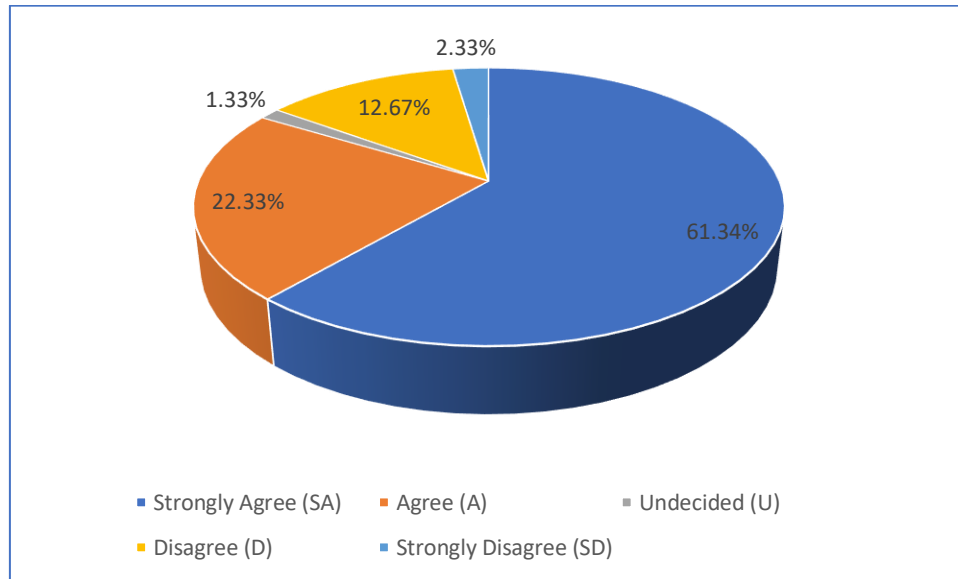


Figure 12. Recommended pest control methods for sustainable agricultural systems have potential for more pests in the long term

From the above table and figure, it was found that the respondents belongs to strongly agree: 61.34%, agree: 22.33%, undecided: 1.33%, disagree: 12.67% and strongly disagree: 2.33%.

Table 13. Sustainable agricultural practices help protect the environment and our natural resources

Statement	Options	Respondents	% of respondents
Sustainable agricultural practices help protect the environment and our natural resources	Strongly Agree (SA)	126	42
	Agree (A)	123	41
	Undecided (U)	21	7
	Disagree (D)	24	8
	Strongly Disagree (SD)	6	2
	Total	300	100

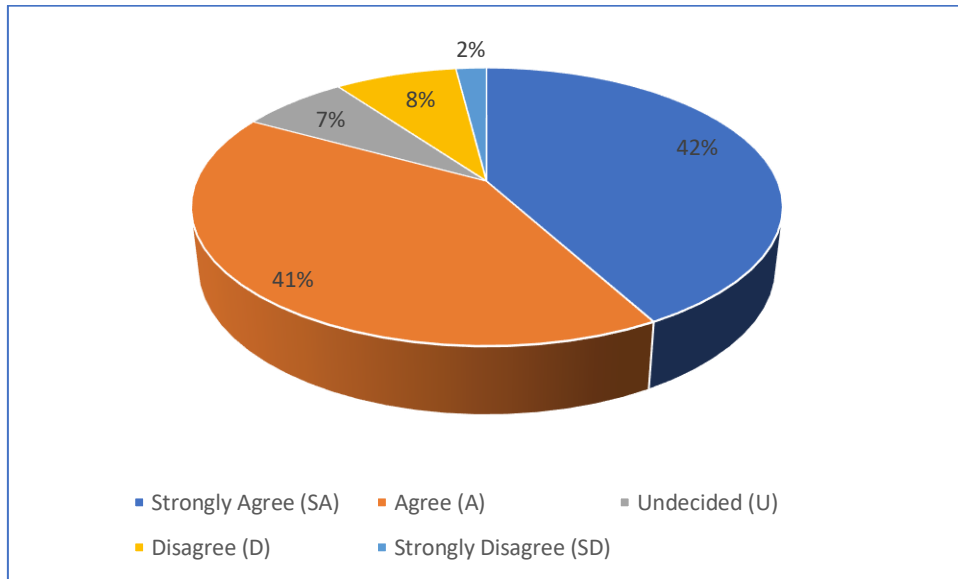


Figure 13. Sustainable agricultural practices help protect the environment and our natural resources

From the above table and figure, it was found that the respondents belongs to strongly agree: 42%, agree: 41%, undecided: 7%, disagree: 8% and strongly disagree: 2%.

Table 14. There may be insufficient labour for the workload required in sustainable agricultural system

Statement	Options	Respondents	% of respondents
There may be insufficient labor for the workload required in sustainable agricultural system	Strongly Agree (SA)	69	23
	Agree (A)	71	23.67
	Undecided (U)	20	6.67
	Disagree (D)	84	28
	Strongly Disagree (SD)	56	18.66
	Total		300

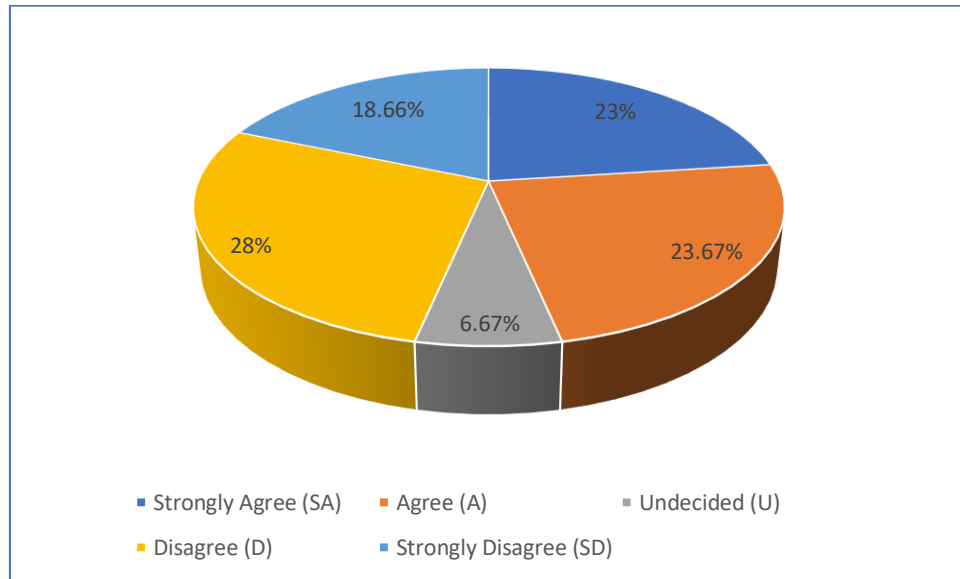


Figure 14. There may be insufficient labour for the workload required in sustainable agricultural system

From the above table and figure, it was found that the respondents belongs to strongly agree: 23%, agree: 23.67%, undecided: 6.67%, disagree: 28% and strongly disagree: 18.66%.

Table 15. Sustainable agricultural systems should produce an adequate food supply to feel the world population

Statement	Options	Respondents	% of respondents
Sustainable agricultural systems should produce an adequate food supply to feel the world population	Strongly Agree (SA)	116	38.67
	Agree (A)	104	34.67
	Undecided (U)	18	6
	Disagree (D)	37	12.33
	Strongly Disagree (SD)	25	8.33
	Total	300	100

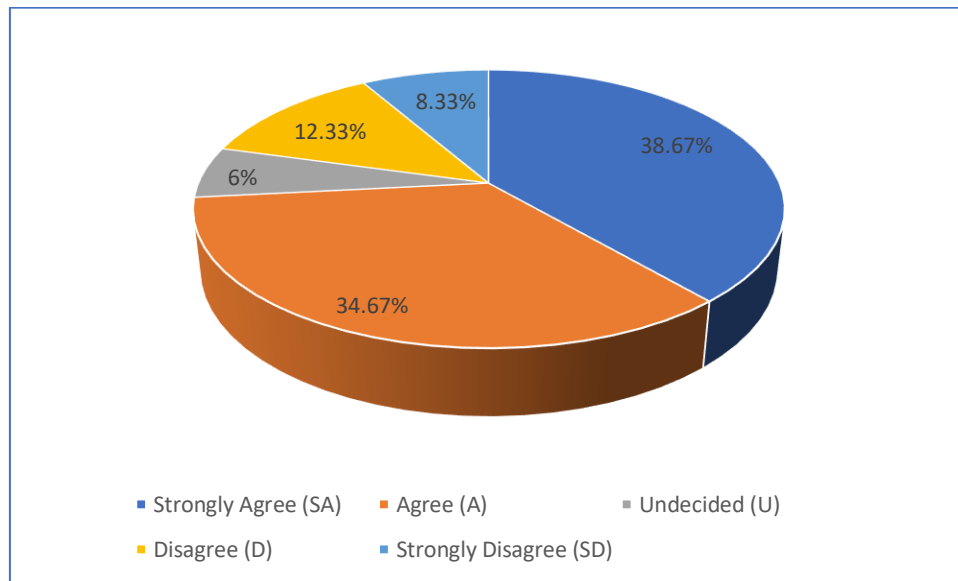


Figure 15. Sustainable agricultural systems should produce an adequate food supply to feed the world population

From the above table and figure, it was found that the respondents belongs to strongly agree: 38.67%, agree: 34.67%, undecided: 6%, disagree: 12.33% and strongly disagree: 8.33%.

CONCLUSION:

The size of the base farm, the resources available, the growing environment (rain or irrigation), the urban or rural setting, the types of crops and businesses operating under the government's specific macroeconomic policies, the dynamics of supply and demand, and societal customs all affect how effective a given package of sustainable agriculture is. Per socioeconomic requirements, a wide range of sustainability-related topics were thoroughly researched. According to the studies overall conclusions, increasing sustainability can be achieved by implementing methodical changes in crop and livestock production as well as resource management.

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