ANALYSIS OF COMMUNITY SATISFACTION INDEX (CSI) IN THE SOCIAL PROJECT: IMPLEMENTATION OF GOOD AGRICULTURAL PRACTICE (GAP) TO ENHANCE HIGH-LYCOPENE TOMATO CULTIVATION

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Abstract— ***This study aims to evaluate the Community Satisfaction Index (CSI) associated with the implementation of Good Agricultural Practice (GAP) in enhancing high-lycopene tomato cultivation. Employing a quantitative survey design, the research assessed participant satisfaction across nine core components, including program requirements, procedures, service delivery, costs, staff competence, and infrastructure support. The results indicate a generally high level of satisfaction, with the overall CSI reaching 92.06, which classifies the program performance as "very good." Among the assessed components, the Competence of Program Staff received the highest rating, reflecting the vital role of knowledgeable facilitators in ensuring program success. While most components were positively evaluated, facilities and infrastructure emerged as areas requiring further development to enhance long-term sustainability. The use of simple yet impactful technologies, coupled with clear communication and open knowledge-sharing sessions, contributed to the program's positive reception. These findings suggest that the program was well-accepted by the community and is considered feasible for continuation and potential expansion in similar agricultural contexts.***

Keywords— Community Satisfaction Index (CSI), Good Agricultural Practice (GAP), tomato cultivation, lycopene.

I. INTRODUCTION

Social activities, commonly referred to as social projects, have been widely implemented and involve various elements of society, including academics, entrepreneurs, government, media, and the community itself. Entrepreneurs and the government frequently take on the role of investors, providing funding for these social projects. As a result, they are entitled to get feedback regarding the projects' execution and results. Data or information related to the level of community satisfaction with a particular program is referred to the Community Satisfaction Index (CSI). While CSI is typically used by companies to measure consumer satisfaction with their products or services, it can also be applied to social projects carried out by companies or the government for the benefit of society[1]. Therefore, CSI serves as an indicator of the satisfaction level of the beneficiaries of a social project toward the program.

"Implementation of Good Agricultural Practice to Enhance High-Lycopene Tomato Cultivation" is one such program initiated by academic stakeholders, with funding provided by the government. This social project aims to address the issue of tomato price fluctuations in the market, which often lead to food waste—where tomatoes are discarded by farmers when market prices extremely fall. During such price drops, farmers tend to dispose of or leave tomatoes to rot in the fields to avoid financial losses[2].

One of the solutions offered by this social project is to transform the issue of tomato food waste into an opportunity by applying Good Agricultural Practices (GAP) in tomato cultivation to produce tomatoes with high lycopene content. Tomatoes with a high lycopene content can increase in market value and be used as raw materials for industrial-grade goods. Industries that utilize tomatoes for their natural lycopene include the food, pharmaceutical, and cosmetics sectors. In addition, a key challenge in the implementation of GAP is changing the traditional cultivation practices of tomato farmers by introducing new agricultural technologies.

GAP are essential for sustainable tomato production, aiming to improve yield, quality, and environmental sustainability. It includes balanced nutrient management[3], pest and disease control[4], and efficient resource use[5], which are critical in cultivating high-lycopene tomatoes, known for their health benefits. Studies show that tomato farmers are most aware of and practice fertilizer application, weed control, and pest management as part of GAP[6]. These practices are crucial for achieving high yields and quality in tomato cultivation, including varieties rich in lycopene. Farmers' satisfaction and adoption of GAP are influenced by several factors, including age, education, farming experience, access to information, membership in farmer groups, market availability, and social influence. The support from agricultural extension agents and formation of cooperatives also enhance farmers' ability to implement GAP effectively. Despite the benefits, farmers face challenges such as lack of credit facilities,

fluctuating market prices, and climate-related risks[7]. These challenges can affect their satisfaction level with GAP programs, as economic returns are a critical component of satisfaction. Implementation of GAP has led to improved yield and income for farmers, even under challenging conditions. For example, integrated pest management, balanced nutrition, and staggered planting have enhanced productivity and sustainability. Moreover, certification programs like GLOBAL G.A.P. have added value to tomato products, improved market access, and increased farmers' trust and satisfaction by standardizing production and ensuring environmental sustainability [8].

The project, which has been running for a year, is being evaluated for its feasibility and effectiveness using the CSI. It provides an overview of the effectiveness of GAP in influencing the cultivation behaviour of tomato farmers, thereby allowing for a conclusion to be drawn regarding whether the social project has achieved its intended objectives..

II. RESEARCH METHODS

This study employed a descriptive-qualitative approach to explore community satisfaction with the implementation of GAP to enhance high-lycopene tomato cultivation program. The assessment of CSI was conducted using a systematic approach to measure and evaluate the quality of the program from the community's perspective, both within the scope of individuals or group and organization. Data for the measurement of CSI were collected from three regencies identified as the primary tomato-producing regions in West Java Province: Bandung, Garut, and Sukabumi. In each regency, one farmer group registered in the Agricultural Extension Management Information System (SIMLUHTAN) was selected as a representative. Each farmer group contributed feedback through the completion of 20 questionnaire samples, which served as the basis for the CSI assessment of the program.

Data collection employed a combination of methods, including survey, in-depth interviews, questionnaire surveys, and focus group discussions. This survey employed a qualitative approach, utilizing the Likert Scale as the primary measurement instrument. According to determination of the number of survey respondents was based on the Krejcie and Morgan formula, which is commonly used to establish sample sizes in research according to a specific population. The survey was conducted using an in-depth interview approach to gain deeper insights into the issues faced and to design a program that aligns with the actual needs of the tomato farmers. The collected data were subsequently processed and filtered to ensure relevance to the CSI measurement, thereby reducing potential bias and preventing overclaiming in the interpretation of results.

According to the Regulation of the Minister for Administrative and Bureaucratic Reform (PERMENPAN RB) No. 14 of 2017, there are nine core components assessed in the calculation of CSI[9]: requirements; procedures; service time; costs; service specification; competence of program staff; staff behaviour; facilities and infrastructure; complaint handling. In this study, these core components were operationalized into 20 questions using a 1–4 satisfaction scale, administered during the interview sessions. Each question was assigned a weight of 5%, which was then converted into a CSI ranging from 25 to 100. The results of the CSI calculation were subsequently interpreted using Table 1 below.

TABLE 1. INTERPRETATION OF CSI CATEGORY

CSI	Category	Interpretation
25-64.99	D	Needs to be improved
65-76.60	C	Requires improvement
76.61-88.30	B	Acceptable and should be maintained
88.31-100	A	Highly satisfactory

III. RESULT AND DISCUSSION

The study was conducted by involving 10 tomato farmers from each farmer group across three regencies, resulting in a total of 30 respondents who participated in the CSI measurement. The sample size was determined using the following formula:

$$n = \frac{\lambda^2 . N . P . Q}{d^2 . (N-1) + \lambda^2 . P . Q}$$

Description:
n= number of samples
λ^2= multiplier factor (degrees of freedom = 1 X variable),
N= number of populations
P=estimated success proportion (0.5)
Q=estimated failure proportion
d= margin of errors (0.05)

Based on the calculation above, the minimum required sample size for the questionnaire was determined to be 28 respondents.

The questionnaire items were developed based on the respondent's perspectives regarding the implemented program. The evaluation was conducted using a 4-point Likert scale with the following scoring criteria:

1= respondent very disagree with the statement
2= respondent disagree with the statement
3= respondent agree with the statement
4= respondent very agree with the statement

The questions were formulated in accordance with the assessment criteria outlined in PERMENPAN-RB No. 14 of 2017, with each statement representing a specific aspect of the program's performance evaluation. The following is a list of the questionnaire items along with their corresponding evaluation components in Table 2:

TABLE 2. SATISFACTION LEVEL OF COMPONENT ASSESSMENT

Core Component Assessment	Statements	Satisfaction Level
Requirements	I understand that participation in this program requires a commitment to remain	3,75

	actively involved until its completion.	
Requirements	I understand the information provided about the program, and I can directly ask the program organizers if I need further clarification.	3,66
Procedures	I understand that the program implementation procedures are easy to follow.	3,63
Procedures	I did not encounter any difficulties in following this program.	3,72
Service time	I feel that the scheduled activities were conducted on time.	3,62
Service time	I received the promised assistance from the program in a timely manner.	3,76
Costs	I have never paid any fees for participating in this program.	3,62
Costs	I can openly report to the organizers if there are any unexpected costs during the implementation of this program	3,76
Service specification	I understand that this program is highly beneficial for tomato farmers.	3,71
Service specification	I feel that this program meets my expectations	3,75
Competence of program staff	I am aware that the program facilitators have adequate knowledge and skills related to the program.	3,94
Competence of program staff	I am always satisfied with the answers provided by the program facilitators.	3,90
Staff behaviour	I feel that the program implementation team is courteous and respectful during activities.	3,71
Staff behaviour	I feel appreciated when interacting with the program facilitators.	3,61
Complaint handling	I understand that this program provides new insights into Good Agricultural Practices (GAP) for tomato cultivation.	3,62
Complaint handling	I understand that this program will have a significant long-term impact.	3,46
Facilities and infrastructure	The provided facilities support the successful implementation of the program.	3,42
Facilities and infrastructure	I understand that after the program ends, I am responsible for maintaining the provided facilities and making the best use of them.	3,46
General	I believe this program is very well-conducted and beneficial.	3,74
General	I am willing to participate in any follow-up program if it is conducted in the future.	3,79

The results presented in Table 2. indicate participant satisfaction across various core components of the program. Overall, the data show a generally high level of satisfaction, with most mean scores ranging between 3.42 and 3.94 on a 4-point Likert scale.

Requirements received relatively high satisfaction scores, with participants acknowledging their understanding of the commitment required to participate in the program (M = 3.75) and the clarity of information provided (M = 3.66). This suggests that the program successfully communicated expectations and provided sufficient informational support.

Under the Procedures component, responses indicate ease of participation, as reflected by the scores for procedural clarity (M = 3.63) and the absence of significant difficulties during program implementation (M = 3.72). These findings imply that the operational aspects of the program were well-structured and accessible.

In terms of Service Time, both statements were rated positively. Punctuality in executing scheduled activities (M = 3.62) and timely delivery of promised support (M = 3.76) highlight effective time management and logistical coordination by the program team.

For Costs, the perception of transparency and financial accessibility was strong. Respondents agreed that they did not incur participation fees (M = 3.62) and could report unexpected costs (M = 3.76), reinforcing the program's credibility and openness in financial matters.

The Service Specification component also showed favorable responses, with participants acknowledging the program's benefits for tomato farmers (M = 3.71) and indicating that it met their expectations (M = 3.75). These findings suggest that the program's objectives were well-aligned with participant needs.

The highest satisfaction ratings were observed in the Competence of Program Staff domain. Participants strongly agreed that facilitators possessed adequate knowledge and skills (M = 3.94) and consistently provided satisfactory responses to queries (M = 3.90), emphasizing the technical proficiency of the implementation team.

Staff Behavior was rated positively, though slightly lower than staff competence. Participants felt respected (M = 3.71) and appreciated (M = 3.61), indicating a generally positive interpersonal dynamic between participants and facilitators.

Responses regarding Complaint Handling were moderately high, with recognition of the program's contribution to knowledge of Good Agricultural Practices (M = 3.62) and its perceived long-term impact (M = 3.46). These slightly lower scores may suggest areas for improvement in post-program follow-up or impact communication.

Satisfaction levels for Facilities and Infrastructure were among the lowest, with scores of 3.42 and 3.46 respectively. These results may reflect participant concerns regarding the adequacy or sustainability of the resources provided, and highlight a potential area for future program enhancement.

Finally, General Satisfaction with the program was high. Participants believed the program was well-executed and beneficial (M = 3.74), and expressed willingness to engage in future initiatives (M = 3.79), reflecting strong overall approval and program endorsement.

Based on the data presented in Table 1, the core component assessments were grouped accordingly, and the mean score for each component was calculated, as shown in Table 3 below.

TABLE 3. AVERAGE SCORE OF CORE COMPONENT CATEGORY

No	Core Component Assessment	Average Score
1	Requirements	3,71
2	Procedures	3,68
3	Service time	3,69
4	Costs	3,69
5	Service specification	3,73
6	Competence of program staff	3,92
7	Staff behaviour	3,66
8	Complaint handling	3,54
9	Facilities and infrastructure	3,44

Each of the nine core components assessed contributed to the overall satisfaction level, with the highest scores recorded in the categories of competence of program staff (average score: 3.92/4). Respondents reported that the program staff demonstrated a strong command of relevant skills and newly introduced knowledge that was both appropriate and readily applicable by the broader community. The use of simple yet effective technologies contributed to significant and tangible impacts at the local level. Moreover, the staff were consistently able to deliver clear and comprehensive explanations regarding the technological aspects of the program, enhancing participant understanding and engagement. Throughout the implementation period, issues raised by participants were addressed effectively, supported by open discussion sessions that fostered meaningful dialogue and facilitated knowledge sharing among stakeholders.

Conversely, the component with the lowest satisfaction score was infrastructure and facilities, with an average rating of 3.44/4. Respondents noted limitations in access to demonstration plots and inadequacies in supporting tools or post-harvest facilities. This limitation is primarily attributed to the inadequacy of equipment available for processing tomatoes into powder form. Additionally, the optimization of the existing equipment has not yet reached its full potential, thereby preventing the successful production of the intended final product. This indicates a potential area for improvement in future implementations, particularly if the program is to be scaled up.

The results of CSI indicate that the social project has generally been well-received by its beneficiaries. Based on data collected from 28 tomato farmers as respondents across three regencies (Bandung, Garut, and Sukabumi), the overall CSI score reached 92.06, which falls within the "Highly Satisfactory" category according to the standardized interpretation scale (range 81–100).

The high CSI score suggests that the program successfully addressed the key needs of tomato farmers in the selected regions, particularly in improving the value and marketability of their crops through the introduction of Good Agricultural Practices (GAP). By focusing on high-lycopene tomato cultivation, the project not only introduced sustainable farming techniques but also provided a viable strategy to mitigate the economic impact of price fluctuations and reduce food waste.

The positive feedback from the community reflects the program's alignment with local agricultural challenges and the effectiveness of its participatory design. The use of in-depth interviews and focus group discussions during the program development phase likely contributed to this alignment, enabling the intervention to be tailored closely to farmer needs and local agro-ecological conditions.

Moreover, the systematic application of CSI as an evaluative tool provided quantifiable evidence of program impact from the community's perspective. This reinforces the value of CSI not only as a measurement instrument but also as a feedback mechanism for continuous program improvement. Importantly, the results affirm that applying GAP principles in smallholder tomato farming can enhance both agricultural output quality and farmer satisfaction, especially when accompanied by institutional support.

Nonetheless, several areas warrant further attention. The relatively lower satisfaction score in the infrastructure category suggests the need for additional investment in physical facilities, particularly those related to post-harvest handling and storage. Such improvements could further enhance program outcomes and ensure the long-term sustainability of high-lycopene tomato production.

IV. CONCLUSION

The results of this study demonstrate a high level of community satisfaction with the implementation of a social

initiative aimed at promoting Good Agricultural Practice (GAP) in the cultivation of high-lycopene tomatoes. Of the nine key components evaluated, the competence of program personnel emerged as the most highly rated aspect, emphasizing the critical importance of well-informed and communicative facilitators in ensuring the effectiveness and credibility of program delivery.

While various elements of the program—such as the clarity of operational procedures, transparency of associated costs, and punctuality of service provision—received favorable assessments, the availability and adequacy of facilities and supporting infrastructure were identified as areas requiring further development to enhance long-term sustainability and operational efficiency.

The strategic application of simple yet impactful technologies, coupled with clear communication and participatory knowledge-sharing mechanisms, played a significant role in facilitating community engagement and increasing the perceived value of the program. In summary, the initiative exhibited a strong congruence with the community's needs and expectations, providing critical insights and practical implications for the design and implementation of future agricultural extension and rural development programs.

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