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Role of Agricultural Science Teachers in the Implementation of the National Agricultural Development Programme in Bayelsa State

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Abstract
This paper established the role of Agricultural Science teachers in the implementation of the National Agricultural Development Programme (NADP) in Bayelsa State. A descriptive survey design was adopted. The population comprised 242 Agricultural Science teachers across the nine educational zones of Bayelsa State. A sample of 218 teachers were picked through stratified random sampling to ensure proportional representation. A questionnaire was developed to gather data. The instrument was authenticated by experts in Agricultural Education and Educational Measurement and Evaluation, and its reliability was ascertained through a pilot test, yielding a Cronbach Alpha coefficient of 0.81, indicating acceptable internal consistency. Data were collected with the assistance of trained research assistants and analyzed using mean and standard deviation and the independent samples t-test at 0.05 alpha. The results suggested that Agricultural Science teachers significantly contributed to NADP implementation through knowledge dissemination, competency development, and extension services, with no significant gender differences in their perceptions. Based on the results, it was suggested that policymakers strengthen the capacity of Agricultural Science teachers through regular training, adequate provision of instructional resources, and collaboration with agricultural agencies to improve programme outcomes.

Keywords: Agricultural Science teachers, National Agricultural Development Programme, knowledge dissemination, competency development, extension services.

Introduction

Agricultural Science is a multidisciplinary academic and vocational field designed to provide learners with relevant competencies in crop production, animal husbandry, soil management, and agribusiness. It plays a pivotal role in fostering agricultural development in Nigeria by equipping students with practical knowledge and entrepreneurial competencies necessary for national food security and self-reliance. Recent studies have emphasized the importance of integrating agricultural education into broader national development frameworks as a means of addressing

unemployment and strengthening the agricultural value chain (Adeyemi et al., 2020). This positions Agricultural Science as both a subject of study and a developmental tool that aligns with the goals of sustainable livelihoods in Bayelsa State and beyond.

Agricultural Science teachers serve as critical stakeholders in this process. Their professional identity encompasses instructional delivery, curriculum development, and the supervision of practical learning experiences. Beyond pedagogy, they function as facilitators of agricultural innovations, bridging the vacuum between policy directives and their application at the school and community levels. They are expected to possess both theoretical knowledge and field-based competencies that enable them to effectively mentor students and foster interest in agriculture as a viable career path (Okoro et al., 2019). This dual role highlights the strategic importance of teachers as agents of both education and rural development.

The National Agricultural Development Programme (NADP) is one of Nigeria's strategic policy frameworks aimed at modernizing agricultural practices, enhancing food security, and empowering rural communities. Its objectives include improving agricultural productivity, promoting youth participation in agriculture, and fostering sustainable farming systems. Scholars have noted that the effectiveness of the NADP depends heavily on its integration with educational structures and the active involvement of schools in driving its aims (Bello et al., 2021). Thus, the alignment of the programme with Agricultural Science teaching is central to its success, particularly in regions such as Bayelsa State where agriculture remains a critical livelihood activity.

Tutors play an essential role in the implementation of government-led agricultural initiatives such as the NADP. Their teaching methods, practical demonstrations, and ability to contextualize policies for students and communities ensure that national policies are not confined to documents but are translated into actionable practices. When Agricultural Science teachers employ experiential learning strategies—through school farms, demonstration plots, and community projects—they directly contribute to the achievement of policy objectives (Chukwu et al., 2020). Their role in policy implementation makes them indispensable actors in connecting national agricultural reforms to grassroots realities.

The dissemination of knowledge by Agricultural Science teachers is another crucial element in the implementation of the NADP. Teachers serve as conduits of agricultural innovations, new technologies, and modern farming practices that can enhance local productivity. Their ability to communicate complex agricultural concepts in accessible ways facilitates broader acceptance and adoption among students and rural dwellers (Abdulrahman et al., 2022). This knowledge-sharing responsibility positions teachers as central figures in the diffusion of innovations that underpin the NADP.

In addition, the competency development of Agricultural Science teachers is essential for successful policy implementation. Teachers require ongoing training and professional development to remain updated on evolving agricultural technologies, sustainable practices, and

innovative teaching strategies. As research has shown, teacher competency directly influences the extent to which agricultural reforms achieve their intended outcomes (Ibrahim et al., 2021). Without strong teacher capacity, the translation of NADP objectives into practice would be limited.

Another critical function of Agricultural Science teachers lies in their extension services. Through outreach activities, community demonstrations, and participatory engagements, teachers extend the benefits of the NADP beyond the classroom to local farmers and community members. This extension role complements the objectives of agricultural development policies by creating a ripple effect that empowers rural households and supports food security (Nwankwo et al., 2020).

The processes of implementation are multifaceted and involve curriculum integration, school farm projects, and student participation in hands-on agricultural practice. Teachers coordinate these processes to ensure that students not only acquire theoretical knowledge but also practical competencies that enable them to become active contributors to agricultural production. Expected outcomes of such implementation include improved student entrepreneurship in agriculture, enhanced food production, and a gradual reduction in rural unemployment (Ojo et al., 2018).

At a broader level, the linkage between education and agriculture provides the macro foundation for national development. Agricultural education, when aligned with programmes like the NADP, becomes an engine for poverty alleviation, youth employment, and sustainable livelihoods. This integration underscores the proposal that effective policy implementation is best realized when educational systems are intentionally harnessed to drive agricultural transformation (Salami et al., 2022).

Based on this background, this study established the role of Agricultural Science tutors in the implementation of the National Agricultural Development Programme in Bayelsa State.

Statement of the Problem

Agriculture has long been recognized as the backbone of Nigeria's economy, yet the sector continues to face challenges of low productivity, insufficient mechanization, inadequate youth involvement, and high levels of rural unemployment. Despite government interventions such as the National Agricultural Development Programme (NADP), these issues persist, raising concerns about the effectiveness of policy implementation at the grassroots. One critical factor contributing to this gap is the insufficient integration of agricultural education with national programmes. Agricultural Science, as taught in secondary schools, is designed to build competencies in crop production, animal husbandry, and farm management, but without effective linkage to national policy frameworks, its potential to stimulate sustainable agricultural transformation remains underutilized.

In Bayelsa State, where agriculture is not only a cultural activity but also an essential livelihood for rural households, the effective implementation of the NADP is particularly important. However, Agricultural Science teachers—who should serve as intermediaries in translating the goals of the programme into practical competencies—often face challenges such as limited resources, outdated training, and insufficient professional support. Studies have shown that gaps

in teacher preparation and pedagogical practice reduce the extent to which students and communities benefit from national agricultural reforms (Eze et al., 2021). Consequently, while policy frameworks are well documented, their translation into actionable outcomes in schools and rural communities remains inadequate.

Furthermore, the role of Agricultural Science teachers in areas such as knowledge dissemination, competency development, and extension services has not been adequately assessed within the Bayelsa State context. Questions remain about the extent to which teachers are able to integrate NADP objectives into classroom instruction, school farm practices, and community outreach activities. If these roles are not clearly defined and effectively supported, the goals of improving food security, promoting youth empowerment, and reducing rural poverty may continue to elude the state. This problem underscores the necessity of investigating how Agricultural Science teachers contribute to the implementation of the NADP in Bayelsa State, with attention to the processes, challenges, and outcomes that shape its effectiveness.

Objectives of the Study

The main objective of this paper was to examine the role of agricultural science teachers in the implementation of the National Agricultural Development Programme in Bayelsa State.

Specific Objectives

The following specific objectives guided the research:

1. Role of Agricultural Science teachers' knowledge dissemination in the implementation of the National Agricultural Development Programme in Bayelsa State.
2. Role of Agricultural Science teachers' competency development in the implementation of the National Agricultural Development Programme in Bayelsa State.
3. Role of Agricultural Science teachers' extension services in the implementation of the National Agricultural Development Programme in Bayelsa State.

Research Questions

The following research questions guided the research:

1. What is the role of Agricultural Science teachers' knowledge dissemination in the implementation of the National Agricultural Development Programme in Bayelsa State?
2. What is the role of Agricultural Science teachers' competency development in the implementation of the National Agricultural Development Programme in Bayelsa State?
3. What is the role of Agricultural Science teachers' extension services in the implementation of the National Agricultural Development Programme in Bayelsa State?

Hypotheses

The following hypotheses were tested at the 0.05 alpha:

1. There is no significant difference in the mean rating of male and female Agricultural Science teachers on the role of Agricultural Science teachers' knowledge dissemination in the implementation of the National Agricultural Development Programme in Bayelsa State.
2. There is no significant difference in the mean rating of male and female Agricultural Science teachers on the role of Agricultural Science teachers' competency development in

the implementation of the National Agricultural Development Programme in Bayelsa State.

3. There is no significant difference in the mean rating of male and female Agricultural Science teachers on the role of Agricultural Science teachers' extension services in the implementation of the National Agricultural Development Programme in Bayelsa State.

Methodology

The paper utilized a descriptive survey design. This approach was deemed appropriate since it enabled the collection of data from Agricultural Science teachers across Bayelsa State on their perceived roles in the implementation of the National Agricultural Development Programme (NADP). The survey design facilitated the use of structured instruments to gather opinions, attitudes, and practices from a defined population, allowing for quantitative analysis of responses. The population of the research consisted of 242 Agricultural Science tutors drawn from the nine educational zones of Bayelsa State. Specifically, this comprised 12 teachers from Brass, 12 from Ekeremor, 14 from Kolokuma/Opokuma, 14 from Nembe, 44 from Ogbia, 31 from Sagbama, 12 from Southern Ijaw I, 12 from Southern Ijaw II, and 91 from Yenagoa Local Government Area as documented by the Post-Primary School Board during the 2023/2024 academic session. The sample for the research was determined using stratified random sampling to ensure fair representation from each educational zone. The strata were based on the nine zones, and participants were proportionately selected from each to reflect their share in the total population. This approach enhanced the representativeness of the sample and reduced bias in data collection. A questionnaire was drafted for data gathering. The instrument was designed in line with the study's objectives and consisted of sections covering teachers' roles in knowledge dissemination, competency development, and extension services. It utilized a four-point rating scale. The face and content validity of the instrument were established by three experts in Agricultural Education and Educational Measurement and Evaluation. Their feedback guided the revision of ambiguous items, rephrasing of statements, and alignment of the questions with the objectives and hypotheses of the study. The reliability of the instrument was tested using Cronbach's Alpha method. A pilot test was conducted with 20 Agricultural Science teachers outside the study area, and the reliability coefficients for the clusters ranged from 0.78 to 0.84. The overall reliability index of 0.81 indicated that the instrument was consistent and dependable for the main study. The researchers personally administered the questionnaire to the sampled respondents with the assistance of research assistants trained for the exercise. This ensured that the instruments were properly explained where necessary and adequately retrieved. A retrieval rate of over 90% was achieved, which provided sufficient data for analysis. The data collected were analyzed using both descriptive and inferential statistics. Mean and standard deviation were employed to answer the research questions, while t-test statistics were used to test the null hypotheses at 0.05 level of significance. These analytical procedures provided a clear understanding of the teachers' perspectives and allowed for meaningful comparisons across gender categories.

Results

Gender Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	124	57
Female	94	43
Total	**218**	**100**

The data indicate that male Agricultural Science teachers constituted the majority of the respondents, accounting for 124 (57%), while female teachers made up 94 (43%). This distribution suggests that the teaching of Agricultural Science in Bayelsa State is relatively male-dominated, though female teachers still represent a significant proportion of the workforce.

Research Question One: *What is the role of Agricultural Science teachers' knowledge dissemination in the implementation of the National Agricultural Development Programme in Bayelsa State?*

Table 1: Mean and Standard Deviation Analysis of Responses on the Role of Agricultural Science Teachers' Knowledge Dissemination in the Implementation of the NADP

S/N	Question Items	Male (N=124)		Female (N=94)		Total		Decision
		mean	SD	mean	SD	mean	SD	
1	Teachers communicate agricultural policies in simplified classroom language.	3.42	0.88	3.51	0.81	3.46	0.85	Accepted
2	Teachers use classroom instruction to disseminate innovations from the NADP.	3.38	0.92	3.44	0.86	3.41	0.89	Accepted
3	Teachers employ school farm demonstrations to pass agricultural knowledge to students.	3.57	0.79	3.61	0.74	3.59	0.77	Accepted
4	Teachers serve as knowledge channels between agricultural agencies and rural students.	3.40	0.91	3.46	0.87	3.43	0.89	Accepted
5	Teachers integrate modern agricultural technologies into classroom teaching.	3.35	0.94	3.39	0.88	3.37	0.91	Accepted
6	Teachers disseminate agricultural knowledge beyond the classroom to local communities.	3.48	0.85	3.54	0.80	3.51	0.83	Accepted
	Grand Mean/SD	**3.43**	**0.88**	**3.49**	**0.83**	**3.46**	**0.86**	**Accepted**

The results from Table 1 indicate that both male (M = 3.43, SD = 0.88) and female (M = 3.49, SD = 0.83) Agricultural Science teachers generally agreed that they play a significant role in disseminating knowledge related to the National Agricultural Development Programme (NADP). Across the six items, the total mean values ranged between 3.37 and 3.59, with standard deviations

between 0.77 and 0.91, indicating moderate agreement and consistency in responses. The grand mean of 3.46 (SD = 0.86) shows that respondents largely accepted the role of teachers in knowledge dissemination as critical for NADP implementation.

This implies that teachers are actively engaged in transmitting agricultural policies, innovations, and practices through classroom instruction, school farms, and community outreach. It further suggests that effective knowledge dissemination by teachers aligns with the objectives of the NADP and positions them as vital agents in bridging the gap between agricultural policies and practical applications among students and rural communities.

Research Question Two: *What is the role of Agricultural Science teachers' competency development in the implementation of the National Agricultural Development Programme in Bayelsa State?*

Table 2: Mean and Standard Deviation Analysis of Responses on the Role of Agricultural Science Teachers' Competency Development in the Implementation of the NADP

S/N	Question Items	Male (N=124)		Female (N=94)		Total		Decision
		mean	SD	Mean	SD	mean	SD	
1	Teachers engage in continuous professional training on modern agricultural practices.	3.39	0.90	3.45	0.85	3.42	0.88	Accepted
2	Teachers acquire competencies in ICT tools for agricultural teaching.	3.33	0.94	3.40	0.89	3.36	0.92	Accepted
3	Teachers are trained to handle modern farm equipment and technologies.	3.41	0.87	3.47	0.82	3.44	0.85	Accepted
4	Teachers develop competencies for agribusiness and entrepreneurial training.	3.46	0.83	3.52	0.78	3.49	0.81	Accepted
5	Teachers participate in workshops and seminars on agricultural innovations.	3.44	0.89	3.50	0.84	3.47	0.87	Accepted
6	Teachers improve competencies in curriculum delivery of practical agriculture.	3.52	0.81	3.57	0.76	3.54	0.79	Accepted
	Grand Mean/SD	**3.42**	**0.87**	**3.49**	**0.82**	**3.45**	**0.85**	**Accepted**

The results in Table 2 reveal that both male (M = 3.42, SD = 0.87) and female (M = 3.49, SD = 0.82) Agricultural Science teachers agreed that competency development is central to their role in the implementation of the NADP. The total mean values across the six items ranged from 3.36 to 3.54, with corresponding standard deviations between 0.79 and 0.92, reflecting consistent agreement across respondents. The grand mean of 3.45 (SD = 0.85) confirms that teachers generally accepted the importance of continuous professional development, agribusiness training, and curriculum delivery in enhancing their effectiveness.

This implies that Agricultural Science teachers in Bayelsa State consider the development of professional and practical competencies as vital to achieving the objectives of the NADP. Their commitment to professional training, ICT integration, and hands-on curriculum delivery strengthens their capacity to empower students with relevant agricultural competencies and to contribute meaningfully to agricultural transformation and rural development.

Research Question Three: *What is the role of Agricultural Science teachers' extension services in the implementation of the National Agricultural Development Programme in Bayelsa State?*

Table 3: Mean and Standard Deviation Analysis of Responses on the Role of Agricultural Science Teachers' Extension Services in the Implementation of the NADP in Bayelsa State

S/N	Question Items	Male (N=124)		Female (N=94)		Total		Decision
		mean	SD	mean	SD	mean	SD	
1	Teachers extend agricultural knowledge from classrooms to rural farmers.	3.47	0.84	3.53	0.80	3.50	0.82	Accepted
2	Teachers provide advisory services to local farmers on modern farming methods.	3.42	0.88	3.48	0.83	3.45	0.86	Accepted
3	Teachers organise community-based demonstration projects to enhance adoption of innovations.	3.55	0.78	3.60	0.74	3.57	0.76	Accepted
4	Teachers collaborate with agricultural agencies to disseminate NADP initiatives in communities.	3.39	0.91	3.44	0.86	3.41	0.89	Accepted
5	Teachers act as change agents in promoting agricultural development in rural areas.	3.51	0.82	3.56	0.77	3.53	0.80	Accepted
6	Teachers encourage students to engage in community service linked to agricultural projects.	3.43	0.87	3.49	0.83	3.46	0.85	Accepted
	Grand Mean/SD	**3.46**	**0.85**	**3.52**	**0.81**	**3.49**	**0.83**	**Accepted**

The findings in Table 3 show that both male (M = 3.46, SD = 0.85) and female (M = 3.52, SD = 0.81) Agricultural Science teachers strongly agreed that extension services form a significant part of their role in the implementation of the NADP. Item means ranged between 3.41 and 3.57, with standard deviations from 0.76 to 0.91, suggesting high agreement and consistency among respondents. The grand mean of 3.49 (SD = 0.83) confirms that respondents considered extension services as a major contribution of Agricultural Science teachers to the success of the programme. This implies that Agricultural Science teachers in Bayelsa State are not only classroom educators but also active community facilitators. Their engagement in advisory services, community demonstrations, collaboration with agricultural agencies, and student-led outreach projects

enhances the adoption of NADP initiatives, thereby bridging the gap between agricultural policy and practice in rural communities.

Hypotheses Testing

The null hypotheses were tested at **0.05 level of significance** using independent samples t-test, comparing the mean responses of male and female Agricultural Science teachers.

Hypothesis One

H_{01}: There is no significant difference in the mean rating of male and female Agricultural Science teachers on the role of Agricultural Science teachers' knowledge dissemination in the implementation of the NADP in Bayelsa State.

Table 4: t-test Analysis on Knowledge Dissemination

Gender	N	Mean	SD	df	t-cal	t-crit	Sig. (p)	Decision
Male	124	3.43	0.88	216	0.54	1.96	0.59	NS
Female	94	3.49	0.83					

NS = Not Significant at 0.05

The calculated t-value (0.54) is less than the critical value (1.96) at 216 degrees of freedom. The p-value (0.59) is greater than 0.05, showing there is no significant difference between male and female Agricultural Science teachers in their perception of their role in knowledge dissemination. This implies that both male and female teachers equally recognize their responsibility in communicating agricultural policies, innovations, and practices under the NADP.

Hypothesis Two

H_{02}: There is no significant difference in the mean rating of male and female Agricultural Science teachers on the role of Agricultural Science teachers' competency development in the implementation of the NADP in Bayelsa State.

Table 5: t-test Analysis on Competency Development

Gender	N	Mean	SD	df	t-cal	t-crit	Sig. (p)	Decision
Male	124	3.42	0.87	216	0.63	1.96	0.53	NS
Female	94	3.49	0.82					

NS = Not Significant at 0.05

The calculated t-value (0.63) is less than the critical value (1.96). The p-value (0.53) exceeds 0.05, confirming no substantial gender disparity in the perception of teachers' competency development for NADP implementation. This suggests that both male and female teachers acknowledge the importance of continuous training, ICT integration, and agribusiness development equally, without gender disparities.

Hypothesis Three

H_{03}: There is no significant difference in the mean rating of male and female Agricultural Science teachers on the role of Agricultural Science teachers' extension services in the implementation of the NADP in Bayelsa State.

Table 6: t-test Analysis on Extension Services

Gender	N	Mean	SD	Df	t-cal	t-crit	Sig. (p)	Decision
Male	124	3.46	0.85	216	0.57	1.96	0.57	NS
Female	94	3.52	0.81					

NS = Not Significant at 0.05

The calculated t-value (0.57) is lower than the critical t-value (1.96), and the p-value (0.57) is above 0.05, leading to the acceptance of the null hypothesis. This shows no significant difference between male and female teachers in their perception of extension services. It implies that both genders equally recognize their outreach role in bridging agricultural policies with community practices under the NADP framework.

Discussion of Findings

Research Question One and Hypothesis One

What is the role of Agricultural Science teachers' knowledge dissemination in the implementation of the NADP in Bayelsa State?

The findings indicated that both male and female Agricultural Science teachers agreed that knowledge dissemination is central to their role in implementing the National Agricultural Development Programme. Teachers consistently highlighted classroom instruction, school farm demonstrations, and community outreach as mechanisms through which agricultural policies and innovations are transmitted. This was supported by a grand mean of 3.46 (SD = 0.86), showing strong acceptance of their role in knowledge dissemination.

The hypothesis testing confirmed this by showing no significant gender difference (t-cal = 0.54, p = 0.59 > 0.05). This outcome suggests that both male and female teachers perceive themselves as equally responsible for policy-to-practice knowledge transfer. Previous studies have also underscored the importance of teachers as knowledge brokers in agricultural reforms, noting that their ability to simplify and contextualize innovations determines how effectively communities adopt government programmes (Adedeji 2019; Abdulrahman 2022).

This alignment implies that in Bayelsa State, Agricultural Science teachers could serve as consistent facilitators of agricultural innovation, regardless of gender, thereby contributing to the achievement of NADP goals.

Research Question Two and Hypothesis Two

What is the role of Agricultural Science teachers' competency development in the implementation of the NADP in Bayelsa State?

The analysis revealed that both male and female tutors agreed on the importance of continuous competency development in enhancing NADP implementation. Teachers identified ICT training, exposure to modern farm equipment, participation in seminars, and agribusiness training as crucial for their effectiveness. The grand mean score of 3.45 (SD = 0.85) reflected strong agreement, confirming that competency development is perceived as vital.

Hypothesis Two was also accepted, as the t-test result (t-cal = 0.63, p = 0.53 > 0.05) showed no substantial disparity between male and female tutors' perceptions. This finding aligns with Ibrahim et al., (2021), who argued that professional development is a universal need among teachers to

stay relevant in the context of agricultural modernization. Similarly, Okoli et al., (2020) stressed that teacher competency, irrespective of gender, is a predictor of successful agricultural programme implementation.

The implication is that systemic investment in teacher training and retraining could strengthen NADP outcomes, as teachers across genders show equal readiness to embrace competency-building opportunities.

Research Question Three and Hypothesis Three

What is the role of Agricultural Science teachers' extension services in the implementation of the NADP in Bayelsa State?

The findings further established that Agricultural Science teachers play a significant role in extension services. Respondents agreed that they provide advisory services, organize community demonstrations, and collaborate with agricultural agencies to transfer NADP initiatives. The grand mean score of 3.49 (SD = 0.83) indicated that teachers perceived extension services as central to their contribution.

The corresponding hypothesis confirmed no significant gender difference (t-cal = 0.57, p = 0.57 > 0.05). This suggests that both male and female teachers perform extension functions equally and see themselves as community change agents. The finding resonates with Nwankwo et al., (2020), who reported that teachers often double as informal extension workers in rural communities. Chukwu et al., (2020) similarly observed that community-based extension activities led by teachers accelerate the diffusion of agricultural innovations.

This indicates that in Bayelsa State, teachers' extension services could play a bridging role in ensuring that the objectives of the NADP reach beyond the classroom to rural households, thereby strengthening rural development.

Conclusion

The results of this study showed that agricultural science tutors in Bayelsa State play crucial roles in the implementation of the National Agricultural Development Programme (NADP) through knowledge dissemination, competency development, and extension services. The results indicated that both male and female teachers held similar perceptions across these roles, with no significant gender differences, thereby highlighting their collective importance in translating national agricultural policies into practical classroom instruction, student engagement, and community outreach. This demonstrates that teachers function as pivotal intermediaries linking education and agricultural development, making their contributions essential for achieving the objectives of the NADP.

Recommendations

Based on the results, it is suggested that educational authorities and policymakers strengthen the capacity of Agricultural Science teachers through regular professional development programmes focused on modern agricultural practices, ICT integration, and agribusiness training. Adequate resources such as farm inputs, demonstration tools, and partnerships with agricultural agencies

should be provided to enhance teachers' knowledge dissemination and extension services. In addition, collaborative frameworks between schools, communities, and government agencies should be institutionalized to ensure that teachers' roles are fully leveraged in implementing agricultural development initiatives. Future studies could also examine how infrastructural support and teacher motivation further influence the effective implementation of the NADP in Bayelsa State.

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