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CONNECTIVITY AMIDST TAX REVENUE AND EDUCATION DEVELOPMENT: ASSESSMENT THROUGH ARDL

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Abstract. This study examines the impact of tax revenue on the education development in Plateau state, Nigeria. The major data for the study are obtained through the secondary source. The monthly data relevant for the study were extracted from the Plateau State Internal Revenue Service, and Plateau State Ministry of Finance from 2018 to 2023 where 72 observations were generated. The data collected were analyzed using regression, linear regression and ARDL. The population of this study covers the major sources of government tax revenue in Plateau State. It was discovered from ARDL analysis that PAYE has negative and significant effect on expenditure on education but Road tax and direct assessment have positive and significant effect on expenditure on education. With this submission, it is concluded that tax revenue significantly impacted expenditure on education positively in Plateau State, Nigeria. Government needs to formulate new proactive regulatory framework, and review or update the existing policies regularly for effectiveness and efficiency in Plateau state taxes administration in order to ensure that tax rates are kept moderate for easy compliance of the tax payers in the state. Also, public enlightenment should be done in Plateau state to educate and motivate tax payers for fulfilment of their civil righteousness promptly in order to ultimately enhance influx of revenue into the Plateau State' purse for education development projects in the state.

Key words: tax revenue, education development, direct assessment, PAYE, road tax.

Introduction

The obstacles of generating tax revenue and effective, productive, and efficient management of generated tax revenue is vital and important to all government (Adegbite et al., 2022). Education in every state is one of the vital area of the government to financing for the benefits of the society at large. Formidable education globally dispenses development in terms of skill empowerment, country progress, economic stability, technology enhancement, and industrial improvement. According to Adegbite, (2021), education investment significantly enhances the productivity of workers in every settlement. Education investment by the government eradicates state industrial, and social problems, fosters character development, individual personality, knowledge acquisition for taking rightful position in society. The deterioration of educational standards as well as decayed educational facilities and other pertinent

infrastructure at state level of educational system which invariably inhibited development ignited brain drain, robbery, taut, insurgence and other society vices which have been currently experiencing in the state. It has been noted that education sector generally at all level in plateau state urgently needs for exigent finance to develop both educational infrastructure and facilities, resuscitate teachers morale, retain, and attract experienced, committed, and disciplined educational personnel, enhances education curriculum and establish conducive teaching/learning enabling environment for quality education.

Funds are needed by the state government to finance and develop education quality, provide educational facilities, and enhance infrastructural development. Numerous institutions' buildings have dilapidated, libraries are equipped with empty textbooks, state experienced teachers' strikes, infrastructural facilities and other educational capital expenditure are ineffective and inefficient in the

state. To that effect, financial resources needed to realize the indispensable motives can be gotten from taxation in the state. Plateau state government realized tax income from the income of the employees, individuals (PAYE), motorists (road tax), informal sectors (non-registered sectors (direct assessment) and other organizations in the state. Plateau state government placed great reliance on taxation as the only revenue source realized in the state aside from allocation from federal government (Maimako et al., 2019). The significance of tax revenue has not been felt in public school in state as it was discovered recently that refurbishment of schools and renovation of furniture, and persistent payment of teachers' salaries are thirst which had emitted crisis in the past. Revenue derived by plateau state government from numerous taxation components is not only to support in boasting the overall government revenue generation but also subsequently needed in achieving other social and developmental welfare projects, in which education is a subset, for good benefit of the populace but reverse has been horrendous and appalling. With the above, this study is engaged to investigate the effect of tax Revenue on the development and enhancement of education sector in Plateau state. This state is examined due to the facts that plateau state economic structure is embedded with mining, tourism and agriculture which is distinctly from other states that heavily depended on oil revenue which influence tax income, and ultimately affects education expenditure and financing. Also, the policy framework and government structure of Plateau state in terms of tax administration, tax policy implementation, budget allocation and local government policies especially on education make this study a unique. Lastly, the state is currently experiencing education unrest in terms of insurgency, infrastructural deficits, teachers' inadequacy, inequality, poverty and strike which invariably necessitated this study to gauge how education was influenced. Infrastructural decay, insurgency, teachers' inadequacy, educational inequality, and government's impotency to meet educational responsibilities in plateau state has ignited concern on the effect on tax revenues on education expenditure in Plateau state. By understanding the influenced of tax revenue on education expenditure in plateau state, the solution and formidable policy implication are provided to the policy makers and the government for effective and productive education enhancement in the state.

Literature review

Education Expenditure

Education is a basic human right for all the children in the state irrespective of social class of the parents, and guardians. This dispensed that primary education is mandatory and free for all the children so that the element of illiteracy is not given chance in the state. Adegbite et al., (2022) opined that education is indispensable to development of the state and country at large. It was stated further that it is pertinent instrument or important sector where knowledge and skills are acquired to solve state social, economic, and technological problems. Education give birth to economic development, economic stability, employment generation, skill empowerment, human capital enhancement, political progress, and technological development (Maimako et al., 2019). According to Adegbite, (2016), human capital accumulation through education influences many sectors significantly, productively and efficiently in the country. It is further advocated that accumulation human capital especially from training and education investment principally, progressively enhances individual growth through salaries enhancement, improve organizations' productivity, and finally develop national economy.

Taxation in Plateau State

Government imposed taxes in Plateau state through government agents in order to achieve government objectives. According to Adegbite, (2017) taxes are compulsory levied on consumption, production, and income of individual and organizations in order to provide certain and essential output to the entire population in the state. Maimako et al., (2019) opined that plateau state government collected taxes from property, transactions, or individuals for enhancement of government revenue for effective utilization in the state. According to Orbunde et al., (2022), every tax is based on legal statute that is without a legal statute, tax can be enforced in any country or state. It was opined further that PIT is charged on salaries, interest income, dividends, business profits, royalties, rents and commissions which ultimately yields more significant income to government. This displays that bearing of PIT on education as a standard gauge for economic development and well-being. Tax is an instrument for social engineering which stimulates general development in education,

health and bridge the income gaps in the country (Ganyam & Ivungu, 2019). Plateau state employs PIT, direct assessment, PAYE and road tax as well as royalty to generate income in order to finance expenditure in the state where education is considered as most desirable. The income realized through PIT offers the most important, dominant and reliable revenue for government for enhancing development in education in the state.

Personal Income Tax (PIT)

PIT is usually based on the individual's total income from all sources, including wages, salaries, investments, and other forms of income. The amount of tax that an individual pays is based on their tax bracket, which is determined by their taxable income. There are usually different tax rates for different levels of income, with higher incomes being taxed at a higher rate. PIT is usually collected on PAYE basis, with individuals paying their taxes throughout the year based on their income. One important concept is the standard deduction, which is a fixed amount that individuals can deduct from their taxable income, regardless of their actual expenses. This deduction is designed to simplify the tax filing process and reduce the amount of taxes that individuals pay. Another concept is itemized deductions, which are deductions that individuals can claim for specific expenses such as medical expenses, charitable donations, or mortgage interest. Individuals can choose to itemize their deductions or take the standard deduction, whichever results in a lower tax liability. Maimako et al., (2019) advocated that positive correlation between development and the revenue from PIT taxes but relative reduced comparing to other taxes. Therefore, it is postulated that:

H01: PIT significantly influences education development in Plateau State

Direct Assessment (DIRASSMT)

Direct assessment refers to the process of calculating and assessing an individual's income tax liability directly from the income reported on their tax return, without the use of a standard deduction or exemption. This method is often used in countries with a progressive tax system, where the tax rate increases as income increases. Under a direct assessment system, individuals must report their income directly to the government, and the tax liability is then calculated based on the reported income. This differs from a standard deduction

system, where individuals are allowed to deduct a certain amount of income from their taxable income, regardless. First, individuals must report their income to the government, usually through a tax return form. Once the income is reported, the government will use a set of rules and formulas to calculate the tax liability. The final tax amount is then paid directly to the government by the individual. The exact process may vary depending on the specific country and its tax laws. One of the main advantages is that it allows for a more accurate assessment of an individual's tax liability, since it is based directly on their reported income (Osinimu & Olayiwola, 2022). This can help to ensure that everyone pays their fair share of taxes. Direct assessment is more transparent, since individuals can see exactly how their tax liability is calculated. This can help to build trust and confidence in the tax system. On the other hand, one of the main disadvantages is that it can be more time-consuming and complex than other methods of assessment, since individuals must report their income in detail and calculate their own tax liability. In the same vein, Mamuda & Alhassan, (2021) opined that direct assessment is more difficult to enforce, since individuals may not report their income accurately or may try to claim deductions that they are not entitled to. This can lead to increased tax evasion and decreased tax revenue. It is postulated that:

H02: Direct assessment significantly influences education development in Plateau State

Pay as You Earned (PAYE)

PAYE (pay-as-you-earn) system, which is the way that most personal income tax is collected in many countries, including the United States. Under this system, individuals pay taxes throughout the year as they earn income, rather than paying a lump sum at the end of the year. The taxes are usually withheld from the individual's paycheck by their employer and remitted to the government. This system helps to ensure that individuals pay their taxes in a timely manner and helps to prevent them from owing a large amount of money at the end of the year. PAYE system determine the individual's tax rate based on their taxable income. This rate is usually determined by the individual's filing status (single, married, etc.) and their number of dependents. The employer then withholds the appropriate amount of taxes from the individual's paycheck each pay period and remits it to the government (Osinimu & Olayiwola, 2022). The

individual can also make adjustments to their withholding if they think they will owe more or less than the amount being withheld. The main advantage of the PAYE system is that it makes it easier for individuals to pay their taxes, since they don't have to come up with a large sum of money at the end of the year. It also helps to prevent individuals from underpaying their taxes, since the taxes are deducted from their paycheck throughout the year. One potential disadvantage of the PAYE system is that it can result in individuals overpaying their taxes if their income changes during the year, since the tax withholding doesn't automatically adjust to reflect these changes. Another potential benefit of PAYE to the government according to Mamuda & Alhassan, (2021); and Osinimu & Olayiwola, (2022) is that it can create a significant amount of paperwork and administrative costs for employers but increase the government revenue. For instance, employers must calculate the appropriate amount of tax to withhold for each employee, and they must keep track of the payments and remit them to the government. They may also be required to file quarterly or annual reports with the government. Therefore, it is posited that:

H03: PAYE significantly influences education development in Plateau State

Road Tax (ROADTAXES)

A road tax, also known as a vehicle excise duty, is a tax charged on vehicles based on their emissions. The money collected from road taxes is typically used to fund the construction and maintenance of roads. Road taxes are usually charged at the time of vehicle registration, and the amount of tax to pay is determined by the vehicle's emissions rating. In some cases, road taxes can also be based on the vehicle's weight, engine size, or other factors. Some countries, like the UK, have a road tax system that is designed to encourage people to buy more environmentally friendly vehicles. It is definitely a way to incentivize people to make more sustainable choices when it comes to their transportation (Adegbite & Shehu, 2022). In Nigeria, road taxes are regulated by the Federal Roads Maintenance Agency (FERMA). All vehicles are required to pay road taxes, and the amount to pay is based on the weight of the vehicle and the distance it's driven. For instance, vehicles that weigh less than 3,500 kilograms and travel less than 10,000 kilometers per year are required to pay a flat rate of 2,000 naira per year. Vehicles that weigh

more than 3,500 kilograms or travel more than 10,000 kilometers per year are required to pay a higher amount (Adegbite & Azeez, 2021). According to Adegbite & Akande (2017), road taxes is established to raise money to maintain and repair roads and to provide financial assistance to other sectors like education. In Nigeria, road taxes are used to fund FERMA, which is responsible for maintaining federal roads. The funds are used to pay for things like resurfacing roads, fixing potholes, and improving road safety. In addition to this, road taxes can also be used to fund other initiatives, like public transportation or pedestrian infrastructure. Some people argue that road taxes should be used solely for road maintenance, while others argue that they should be used for a variety of transportation-related initiatives. Some of the existing literature on road taxes such as Adegbite & Azeez, (2021); and Osinimu & Olayiwola, (2022) found that road taxes are an effective way to raise revenue for government for actualize the government expenditures on education, road maintenance, health services in the country. Another study such as Adegbite & Akande, (2017); Ganyam & Ivungu, (2019); Herdiyana et al., (2020); Nsubuga et al., (2017) from 2017 found that road taxes can have a positive impact on government income which invariably empowered government financially to expand her expenditure on education and other sector in the state. However, it is postulated that:

H04: Road tax significantly influences education development in Plateau State

Socio-Political Theory

The social-political theory of taxation was originally developed by John Stuart Mill, a British philosopher and economist who lived in the 19th century. Mill argued that taxes should be used to promote justice and equality, and he believed that the government had a duty to use taxes to help the poor and disadvantaged. He also believed that taxes should be used to fund public goods, such as education and infrastructure. Another important economist who contributed to the social-political theory of taxation is Adam Smith, who is often considered the father of modern economics. In his book, "The Wealth of Nations," Smith argued that taxes should be used to fund the basic functions of government, such as defense and justice. He also believed that taxes should be levied according to the ability of individuals to pay, and that they should be simple, easy to understand, and predictable. The

social-political theory of taxation is a way of thinking about taxes that considers the social and political implications of different tax policies.

This theory suggests further that taxes can be used to promote certain social and political goals, such as reducing inequality, promoting social welfare, or funding government programs. The theory also emphasizes the importance of fairness and equity in the tax system. In addition to the social and political implications of taxes, the social-political theory of taxation also considers the economic implications. For instance, this theory suggests that taxes can be used to promote economic growth by encouraging investment, or they can be used to control inflation by reducing the money supply. This theory also suggests that taxes can be used to redistribute wealth and income. One specific aspect of the social-political theory of taxation is the concept of vertical equity. This concept suggests that taxpayers with a higher income or wealth should pay more in taxes than those with a lower income or wealth. The idea behind this concept is that those who have more resources should contribute more to the government, since they have benefited more from society. One strength of the social-political theory of taxation is that it takes into account the impact of taxes on economic and social outcomes. By considering the effects of taxes on growth, equality, and social welfare, the theory provides a more comprehensive understanding of the impact of taxation. Another strength of the social-political theory of taxation is that it can be used to justify progressive tax systems, which are designed to reduce inequality by taxing higher-income individuals at higher rates. Another strength of the social-political theory of taxation is that it can be used to justify the provision of public goods and services, which can benefit the entire society. This includes things like education, infrastructure, and education care.

A potential weakness of the theory is that it may not provide enough guidance on how to design an efficient tax system. The theory may also be criticized for its reliance on government intervention in the economy, which some economists believe can lead to inefficiency and waste. Another potential weakness of the theory is that it may not adequately consider the efficiency of taxes. The theory may also be criticized for its focus on social and political goals, rather than on economic efficiency. Also, the theory may not take into account the trade-offs involved in allocating scarce resources between

different government programs. Another potential weakness is that the theory may be difficult to implement in practice, as it requires careful consideration of how taxes will affect different groups of people.

Empirical Review

Hanif et al., (2024) investigated tax knowledge influence on taxpayer compliance in Surakarta which employed perceptions of tax fairness as moderating variables. Purposive sampling was employed to gather data from respondents using questionnaire which were analyzed with Multiple Regression. It was realized that tax fairness' perception and tax knowledge influenced tax compliance positively, significantly and statistically in Surakarta. However, the study was emanated from Surakarta which was limited to knowledge influence on taxpayer compliance which is distinct to the current study.

Olaoye et al., (2023) examined tax revenue effect on economic development of Nigeria from 2003 to 2020. The results of the necessary data obtained from FRIS, CBN, and NBS statistical bulletins explained that taxes from petroleum, company income, education, and value added taxes possessed significant effect on Nigeria economic development. The study invariably concluded that revenue from taxes in Nigeria significantly affected Nigeria economic development positively. Basically, the study examined the effect of tax revenue on the whole country, Nigeria, as not in tandem with the current study which examined one state out of all the states in Nigeria.

Ihenyen et al., (2023) examined the effect of tax income on Nigeria government spending between employing ten years' time series. The results from Vector Error Correction Model (VECM) displayed long-term connection amidst Nigeria government spending and tax collection. Also, government expenditure, population, debt, and tax income all displayed positive correlations statistically and significantly. The study employed ten years' time series and VECM as against the current study which employed monthly data of 72 observations and ARDL.

Using time series data on variables deemed significant indicators of both public spending and economic growth, Anderu & Tosin, (2023) investigated the factors influencing public spending on educational infrastructure and economic growth in Nigeria. The ordinary least squares (OLS) method

was applied in the construction and testing of a public expenditure model. To find out whether regime in Nigeria gave more money to the education sector during the research period—the military or the civilian one—a dummy variable was added to evaluate the expenditure variability between regime changes. The World Bank, National Bureau of Statistics, and Central Bank of Nigeria provided data for the study. The analysis's findings demonstrated that public spending on education had a major effect on economic expansion. Thus, the study employed ordinary least squares (OLS) for analysis but the current study employed potential econometric tools for analysis.

Adamu & Turawa, (2020) investigated the causal association amid government expenditure and tax revenue in Nigeria. The results of Toda-Yamamoto causality analysis which was employed showed a unidirectional causality from tax revenue components to Nigeria government expenditure. Consequentially, the study concluded tax revenue components possessed positive impact on Nigeria government expenditure. Methodologically, the study employed Toda-Yamamoto causality analysis to examine the causality between tax revenue components and Nigeria government expenditure as differed from the current study which employed ARDL.

David & Joseph, (2020) regressed economic growth variables such as labor force participation, FDI and domestic investment on tax revenue in order to study the relationship amid tax revenue and Nigeria's economic growth during the years 1970 to 2011. The outcome demonstrated that there was a positive and substantial correlation among all of the variables and Nigeria's economic growth. Conceptually, the study investigated labor force participation, FDI and domestic investment on tax revenue which is different to the current study which is restricted to tax revenue in plateau state and education expenditure.

Osho & Olaoye, (2020) examined tax system administration's effect on Nigeria government expenditure. Data which were sourced from CBN and National Bureau of Statistics (NBS) publications, and analysed with regression model displayed that tax administration possessed significant influence on Nigeria government expenditure. in Nigeria. The study eventually concluded that tax revenue increment has positive influence on Nigeria government expenditure. Geographically, the study examined tax revenue

which covered entire country Nigeria as against the current study on plateau state, a single state in Nigeria.

Adegbite & Araoye, (2020) assessed the imported goods impact on the income realized from Value Added Tax in Nigeria. The study further examined causality direction among imported goods, VAT revenue, exchange rate, inflation, and interest rate in Nigeria. Adegbite & Araoye, (2020) actively engaging Units root, Granger causality, Johansen co-integration and VECM tests. Results from VECM disclosed that imported goods positively and significantly affected VAT revenue in Nigeria, and bi-directional causality existed amid imported goods and VAT revenue. Nevertheless, the study examined imported goods impact on the income realized from Value Added Tax in Nigeria but not in tandem with the current study.

Etale & Bariweni, (2019) investigated the connected amidst selected tax components' revenue and Nigeria educational development between 2010 and 2018. Secondary data which was collected through FIRS, MOE and CBN, were analyzed with multiple regression. Etale & Bariweni, (2019) publicized that positive relationship ignited amidst education tax, education development and value added tax but with inexistence of significant relationship. The study conclusion displayed that education tax possessed insignificant contribution to education development in Nigeria. The study only employed regression analysis which is not in line with the current study which employed series of econometric analysis for the study.

Ordu & Nkwoji, (2019) determined education tax income impact on Nigeria economic development from 2006 to 2017 using data garnered from FIRS, CBN, and United Nations development bulletins which were analyzed with thematic and Regression analyses. The results exposed that education tax income dispensed significant impact on Nigeria economic development. The study concluded that education tax income positive, strongly and significantly connected with Nigeria economic development. However, the study was confined to education tax and Nigeria economic development as distanced absolutely from this study which is ignited to examine education development and Plateau state. In another study of Yaro & Adeiza, (2021) which also investigated the association amidst economic growth and taxation in Nigeria. The data collected through CBN and FIRS were analyzed with simple parentage. The finding

showed that taxation income through FIRS effectiveness possessed positive influences on Nigeria economic growth.

Folorunso et al., (2019) used tax revenue's influence on infrastructure development to study how tax revenue affected Nigeria's economic growth from 1980 to 2017. They stated that there are links among tax income, infrastructure development and GDP. It was contended that GDP, foreign direct investment, and infrastructure development are the three main ways that tax revenue influences Nigeria's economic growth. They emphasized that having access to infrastructure encourages investment, which fuels economic expansion. Owolabi and Okwu (2011) looked at the value added tax's only contribution to the growth of the Lagos state economy between 2001 and 2005. Every development indicator, including those related to transportation, agriculture, youth and social welfare, education, environmental management, and agriculture, were regressed in the study. They discovered that during the study period, value-added tax revenue had a favorable impact on the growth of the corresponding economic sectors in Lagos State. However, the study is different to the current study because it was carried out in Lagos.

Adegbite et al., (2019) surveyed tax compliance effect on Oyo state PIT return. Primary data majorly sourced through questionnaire administered on the staff of Board of Internal Revenue Oyo State and selected taxpayers. Data realized from questionnaire were scrutinized with chi-square, MANOVA and descriptive statistics, the results generated from scrutinized analysis displayed that positive effect of Tax Compliance on PIT was discovered. That is, any added effort on tax compliance invariably enhances PIT income returns in Oyo state. The study however employed primary data as absolutely distanced from the current study that employed secondary data through Plateau state Board of Inland Revenue.

Adegbite and Akande (2017) examined PIT impact on Oyo government expenditure. Where the data absolutely sourced from Oyo state approved budgets between 1990 and 2015. The results from multiple regressions and PPMC dispensed the positive significant effect of PIT on Oyo state government expenditure. However, the study was ignited from Oyo state as against the current study which emanated from Plateau state. Therefore, the policies in the two states are different from each other. In another study, Adegbite (2019) employed

Johansen cointegration, Regression analysis, Units root, Granger causality and VECM test to gauge taxation effect on Nigeria investment. It was discovered that all taxation components positively and significantly impacted Nigeria investment. Thus, the study examined the entire country, Nigeria, which absolutely differed from the current study that examined only a state in Nigeria. Also, the current study engaged ARDL as analytical tool as against the study which engaged VECM.

Adegbite investigated in 2017 how the personal income tax (PIT) affected Oyo State's ability to generate revenue. It also examined the important aspects of Oyo State's personal income tax revenue realization. Data were taken from the Oyo State government's authorized budgets between 1990 and 2015. Revenue Generation in Oyo State was analysed in connection to PAYE, Road Tax, and CGT using Pearson product moment correlation and multiple regressions. Levies on business premises and registration, market fees, development levies, stamp duties, and taxes on gaming and betting were examined as the components PIT. Results indicated that PAYE significantly increased Oyo state government income significantly. But the study was established for Oyo state decision policy which cannot be emulated in Plateau state.

Adeyemi & Ogunsola (2016) engaged data from NBS, and World Bank indicator, covering the years 1980 to 2013, to investigate the connections among economic growth, education, and human capital indices. The results of ARDL, and Co-integration analysis employed to estimate the relationship among the variables recognized long-run co-integration amidst the variables, and positive long-run relationship existed among enrolment, education, life expectancy, economic growth and gross capital formation but statistically insignificant and negative. However, the data was collected by the study through NBS, and World Bank indicator as distinctly separated from the current study which engaged data from Plateau state.

Adegbite, (2015) conducted an empirical analysis of the effects of corporate tax on Nigeria's revenue profile and also looked at how corporate tax income affects the country's economic growth. From 1993 to 2013, secondary data were gathered from CBN Statistical Bulletin. The link among GDP, corporation tax, VAT, inflation, petroleum tax was examined using multiple regression analysis. According to the study's findings, corporate income tax significantly improves Nigeria's revenue profile

which in turn spurs the country's growth. The government uses the money received from company tax to fulfill its obligations by sponsoring public education, education, and infrastructure, all of which contribute to Nigeria's economic growth. However, the study limited its coverage to corporate tax under the purview of the country as against the current study which examined different components of taxation within the custody of the Plateau state.

The gaps in the literature are being created by this study in order to bridge the gaps inadequate research on education enhancement in Plateau state.

All the existing literature examined and reviewed were unable to establish the potency of taxes on the education enhancement in plateau state, and majority of the study reviewed both in the country and other country stick to tax compliance, economic development, corporate tax and infrastructure development as against the current study on expenditure on education. Also, the econometric analysis packages such as regression, correlation, linear regression and ARDL regression to examine taxes impact on education in plateau state make the study exceptional.

Conceptual Framework



Figure 1 – The effect of tax revenue on education financing

Methodology

The major data for the study are obtained through the secondary source. Secondary data relevant for the study were extracted from the Plateau State of Internal Revenue Service Jos (PSIRS), and Plateau State Ministry of Finance. The monthly data collected were carefully examined and verified to ensure that there were not any form of abnormality and inaccuracy. The data was embedded with various taxes that made up the revenue of the government of Plateau State and income expended on education monthly from 2018 to 2023 where 72 observations were generated. No data of the variables involved were missing during the analysis. The data collected were also validated through cross verification which checked for accuracy and consistency. Time frame was also involved to ensure that data are current and relevant to the research hypotheses. In addition, data cleaning was also conducted to remove duplication, irrelevance and outliers in order to enhance data

accuracy and quality. Taxes under study are PAYE, Direct Assessment and Road tax. The data collected were analyzed using regression, correlation, linear regression and ARDL regression. According to rule of tongue, the mixture of first level and level difference called for ARDL as displayed in Table 6. That is ARDL regression was employed because of mixture of $I(0)$ and $I(1)$. The choice of ARDL is based on the fact that variables incorporated are stationary in different levels. Some variables are stationary at level while others are stationary at first different. This called for ARDL because of these dichotomies in stationary level.

Model Specification

To examine the effect of tax revenue on education in Plateau State, education is considered as dependent variable where Pay as You Earn, direct assessment and road tax are independent variable. The model employed to establish the effect of tax revenue on education expenditure in Plateau State is stated below:

$$EDUC = f(PAYE, DIRASSMT, ROADTAXES, \mu_1) \tag{1}$$

$$EDUC = \alpha_0 + \beta_1PAYE + \beta_2 DIRASSMT + \beta_3 ROADTAXES + \mu_1 \tag{2}$$

ARDL MODEL

$$\Delta PAYE_t = \sum_{k=1}^n \alpha_1 \Delta PAYE_{t-k} + \sum_{k=1}^n \alpha_2 \Delta DIRASSMT_{t-k} + \sum_{k=1}^n \alpha_3 \Delta ROADTAXES_{t-k} + \sum_{k=1}^n \alpha_2 \Delta PAYE_{t-s} + \lambda_1 PAYE_{t-1} + \lambda_2 DIRASSMT_{t-1} + \lambda_3 ROADTAXES_{t-1} + \epsilon_t \tag{3}$$

Whereas EDUC - Education Expenditure
 PAYE - Pay as You Earned
 DIRASSMT - Direct Assessment
 ROADTAXES - Road Tax

Results

The effects of Taxes on Expenditure on Education in Plateau State, Nigeria

This session explained the effects of taxes expenditure on education in Plateau state, Nigeria. The results of Correlation Analysis, VIF, Unit Root Test, Regression, Linear regression and ARDL regression were explained in this session.

In order to examine the relationship between taxes and expenditure on education, correlation analysis was analyzed. According to Table 1 PAYE

has effect and significant relationship on education tax with the value of 0.3687. Also, ROADTAXES has positive significant relationship with expenditure on education with the value of 0.4243. This shows no existence of multicollinearity between road taxes and expenditure on education but DIRASSMT has positive but insignificant relationship with expenditure on education. In conclusion, all variable employed in this study has positive relationship on education expenditure in Plateau state, Nigeria.

Table 1 – Correlation Analysis

	EDU	PAYE	DIRASSMT	ROADTAXES
EDUC	1.0000			
PAYE	0.3687*	1.0000		
DIRASSMT	0.1926	0.0110	1.0000	
ROADTAXES	0.4243*	0.2473	0.1214	1.0000

Source: Researcher’s Computation (2024)

Table 2 – Variance Inflation Factor

Variable	VIF	1/VIF
ROADTAXES	1.08	0.924730
PAYE	1.07	0.938452
DIRASSMT	1.02	0.984872
MEAN	VIF	1.05

Source: Researcher’s Computation (2024)

Table 2 confirmed the report of correlation analysis on the absence of multicollinearity. According to Table 2, Variance Inflation Factor (VIF) confirmed that ROADTAXES has a VIF

value of 1.08, PAYE of 1.07 and DIRASSMT 1.02. All these Values are less than 10 which confirmed and authenticated that there is absent of multicollinearity.

Table 3 – Unit Root Test

Variable	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	p value	Level	Decision
PAYE	-4.264	-3.689	-2.975	-2.619	0.0005	I(0)	Stationary
DIRASSMT	-5.118	-3.689	-2.975	-2.619	0.0000	I(0)	Stationary
ROADTAXES	-4.100	-3.696	-2.978	-2.620	0.0010	I(1)	Stationary
EDUC	-4.079	-3.696	-2.978	-2.620	0.0017	I(1)	Stationary

Source: Researcher's Computation (2024)

The essence of unit root test is to determine the stationarity of the variables selected for this study. From Table 3 it was discovered that PAYE has no unit root among the observation, and it is stationary at level difference because the test statistic value -4.264 is greater than all 1%, 5% and 10% Critical Values of -3.689, -2.975 and -2.619 respectively with P-Value of 0.0005 which is far lesser than 0.05. It was also discovered that DIRASSMT has no unit root among the observation, and it is stationary at level difference because the Test statistic value -5.118 is greater than all 1%, 5% and 10% Critical Values of -3.689, -2.975 and -2.619 respectively

with P-Value of 0.0000 which is far lesser than 0.05. In contrary, ROADTAXES was not stationary at level but stationary at first level because the test statistic value -4.100 is greater than all 1%, 5% and 10% Critical Values of -3.696, -2.978 and -2.620 respectively with P-Value of 0.0010 which is far lesser than 0.05. in same vain, EDUC was not stationary at level but stationary at first level because the Test statistic value -4.079 is greater than all 1%, 5% and 10% Critical Values of -3.696, -2.978 and -2.620 respectively with P-Value of 0.0017 which is far lesser than 0.05.

Table 4 – Regression Results on the Effect of Taxes on Education Expenditure

Dependent Variable	Independent Variables	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]
EDUC	PAYE	.0248943	.0136137	1.83	0.077	-.0028358 .0526244
	DIRASSMT	.442787	2.490716	0.98	0.334	-2.630637 7.51621
	ROADTAXES	2.896004	1.348367	2.15	0.039	.1494693 5.642539
	_CONS	-6.25e+07	4.65e+07	-1.34	0.188	-1.57e+08 3.22e+07
R-squared= 0.7759		Adj R-squared = 0.7080		Prob > F= 0.0149		Root MSE= 7.6e+07
Heteroskedasticity						
chi2(1) = 6.76		Prob > chi2 = 0.0093				

Source: Researcher's Computation (2024)

Regression analysis was done to capture the effect of tax revenue on education expenditure in Plateau state as showed in Table 4. According to the results, PAYE and road tax have positive effect on

expenditure on education. 1% in PAYE increase expenditure on education by 0.02% but significant ($\beta = .0248943$, $t: 1.83$, $P>|t| = 0.077 < 0.1$) at 0.1% level, while road tax also has positive significant

effect of expenditure on education. 1% increase in road tax increases expenditure on education by 2.8% but is significant ($\beta = 2.896004$, $t: 2.15$, $P > |t| = 0.039 < 0.05$) at 0.05 significant level. But direct assessment has positively and insignificant impact

($\beta = .442787$, $t: 0.98$, $P > |t| = 0.334 > 0.05$) on expenditure on education. However, there is present of heteroskedasticity with value of $\text{Prob} > \chi^2 = 0.0093$ which called for linear regression as shown in Table 5.

Table 5 – Linear Regression Results on the Effect of Taxes on Education Expenditure

Dependent Variable	Independent Variables	Coef.	Robust Std. Err.	T	P> t	[95% Conf. Interval]
EDUC	PAYE	.0248943	.0057118	4.36	0.000	.0132598 .0365289
	DIRASSMT	2.442787	1.994004	1.23	0.229	-1.618867 6.50444
	ROADTAXES	2.896004	2.293936	1.26	0.216	-1.77659 7.568598
	_CONS	-6.25e+07	7.94e+07	-0.79	0.437	-2.24e+08 9.92e+07
R-squared= 0.7759		Prob > F= 0.0000		Root MSE= 7.6e+07		

Source: Researcher's Computation (2024)

Due to the existence of heteroskedasticity as showed in Table 4, linear regression came into existence to avert spurious of regression as exhibited in Table 5. According to linear regression, it is only PAYE that has significant effect ($\beta = .0248943$, $t: 4.36$, $P > |t| = 0.000 < 0.05$), others have

insignificant effect of expenditure on education. ARDL was discovered from the unit root test due to the fact that all the variables involved has different level of stationary. PAYE and direct assessment were stationary at level, while road tax and expenditure on education were stationary at first level.

Table 6 – ARDL Results on the Effect of Taxes on Education Expenditure

Dependent Variable	Independent Variables	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]
EDUC	EDUC L1.	.9313025	.0588962	15.81	0.000	.8104575 1.052147
	PAYE	-.0011616	-.0003585	-3.24	0.011	-.0110428 .0087196
	DIRASSMT	3.011996	.8384111	3.59	0.001	1.291718 4.732273
	ROADTAXES	.8746724	0.306903	2.85	0.035	-.0941344 1.843479
	_CONS	-3.89e+07	1.62e+07	-2.40	0.023	-7.22e+07 -5686613
R-squared = 0.7270		Adj R-squared = 0.7162		Prob > F= 0.0000		Root MSE = 2.547e+07

Source: Researcher's Computation (2024)

According to rule of tongue, the mixture of first level and level difference called for ARDL as displayed in Table 6. That is ARDL regression was employed because of mixture of $I(0)$ and $I(1)$. According to ARDL regression result, PAYE has negative and insignificant effect of expenditure on education, but significant because p value is 0.011 ($\beta = -.0011616$, $t: -3.24$, $P > |t| = 0.011 < 0.05$) which is far lesser than 0.05 level of significant. Direct assessment has positive significant impact on

education ($\beta = 3.011996$, $t: 3.59$, $P > |t| = 0.01 < 0.05$) with p value of 0.001 which is less than 0.05, that is, 1% increase in direct assessment increases education by 3.0%. Road taxes also has positive significant impact on expenditure on education ($\beta = .8746724$, $t: 2.85$, $P > |t| = 0.035 < 0.05$) with p value of 0.035 which is less than 0.05% significant level. That is 1% increase on road tax increases expenditure on education by 0.8%. But, lag of expenditure on education confirmed the significant

level of expenditure on education in the long run. R2 and Adjusted R2 with value of 0.727 and 0.716 confirmed the authenticity of the model for the study.

Discussion

This study examined the analysis of the effect of tax revenue on education development in Plateau state from 2018 to 2023. Secondary data relevant for the study were extracted from the Plateau State of Internal Revenue Service Jos, and Plateau State Ministry of Finance. The data collected were analyzed through time series which uses regression analysis, linear regression analysis, and ARDL Regression analysis. It was discovered from the analysis that according to this regression, it is only PAYE that has significant effect, others have insignificant effect of expenditure on education. Linear regression came into existence to avert spurious of regression. The mixture of first level and level difference call for ARDL. ARDL was employed because of mixture of I(0) and I(1). That is ARDL was involved because the unit root test displayed that all the variable involved has different level of stationary. PAYE and direct assessment were stationary at level, while road tax and expenditure on education were stationary at first level. According to ARDL regression result, PAYE has negative and significant effect of expenditure on education, but significant because p value is 0.811 which is greater than 0.05 level of significant. This is in tandem with submission of Adegbite et al., (2019); and Etale & Bariweni, (2019) but derailed from the submission of Ihenyen et al., (2023); Hanif et al., (2024); Osho & Olaoye, (2020); Ganyam & Ivungu, (2019); of Ordu & Nkwoji, 2019; and Yaro & Adeiza, (2021); Adamu & Turawa, (2020); and David & Joseph, (2020). Direct assessment has positive significant impact on education with p value of 0.001 which is less than 0.05, that is, 1% increase in direct assessment increases education by 3.0%. The income realized from direct assessment tax has been utilized judiciously by the government of Plateau state for effective actualization of education goals in the state. This results supports the view of Ihenyen et al., (2023); Osho & Olaoye, (2020); Ganyam & Ivungu, (2019); Adegbite et al., (2019); and Etale & Bariweni, (2019) but disregarded the view of Hanif et al., (2024); Olaoye et al., (2023); and Maimako et al., (2019). In the same vein, Road taxes have positive and significant

effect on expenditure on education. This dispensed that road taxes embedded with revenues potency to actualize education expenditure in plateau state. This in line with the submissions of Adegbite & Akande, 2017; Adegbite & Azeez, 2021; Adegbite & Olatunji, 2021; Etale & Bariweni, 2019; Hanif et al., (2024); Maimako et al., 2019; and Olaoye & Atilola, (2018) but against the submissions of Ihenyen et al., (2023); Osho & Olaoye, (2020); Ordu & Nkwoji, 2019; and Yaro & Adeiza, (2021).

Conclusion

The main objective of this research work is to examine the impact of tax revenue on the education development in Plateau state. Secondary data relevant for the study were extracted from the Plateau State of Internal Revenue Service Jos, and Plateau State Ministry of Finance. The data collected was invariably analyzed using regression and linear regression and ARDL regression. The population of this study covers the major sources of government tax revenue in Plateau State. ARDL was carried out because the unit root test that all the variable involved has different level of stationary. PAYE and direct assessment were stationary at level, while road tax and expenditure on education were stationary at first level. According to ARDL regression result, PAYE has negative and significant effect of expenditure on education. Road taxes and direct assessment have positive and significant effect on expenditure on education. According to the outcome of the study, it is concluded that tax revenue has positive significant impact on expenditure on education in Plateau State positively and significantly in Plateau State. With these submissions, tax revenue significantly impacted education development positively in Plateau State, Nigeria. The income realized from taxes has been utilized judiciously by the government of Plateau state for effective actualization of education goals in the state. Taxes in Plateau state are embedded with revenues potency to actualize education expenditure in the state. Government needs to formulate new proactive regulatory framework, and review or update the existing policies regularly for effectiveness and efficiency in Plateau state taxes administration in order to ensure that tax rates are kept moderate for easy compliance of the tax payers in the state. Also, public enlightenment should be done in Plateau state to educate and motivate tax payers for fulfilment of their civil righteousness

promptly in order to ultimately enhance influx of revenue into the Plateau State' purse for education development projects in the state.

This research is prone to numerous limitations, the accessibility to comprehensive and accuracy data on education expenditure and tax revenue became a challenge. Lack of transparency, inconsistent and incomplete records hindered the timely results which prolong the completion of the paper. Administrative inefficiency and political dynamics which were caused by the changing of government in plateaus state was another limitation to this study.

The discoveries are established on scientific literature where the case study analyzed. Hence,

further research is suggested to expand the knowledge on this research. The future expansion of the research could be piloted by conducting longitudinal research on track dynamic on tax revenue and education financing overtime which can enlighten on the patterns and causality. Also, plateau state can be compared with another state in Nigeria to gauge the significant impact of tax revenue on education in order to swiftly enhance plateau state education system. In addition, examination of the impact of specific tax policy dynamics on education financing can provide formidable insights on how various taxes' structure impact education development in Nigeria.

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JOB BURNOUT AND EMPLOYEE COMMITMENT

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Abstract. Over the years, organizations have faced the challenge of employees' lack of commitment due to job burnout, which can often be exacerbated by excessive workload. This study aims to investigate the effects of burnout and employee workload on employee commitment. Using a survey research design, the study focused on a population of 130 employees from the Coca-Cola Bottling Company in Ilorin. A simple random sampling technique was employed, allowing every member of the population an equal chance of being included in the study. The sample size of 120 was determined using the Taro Yamane sample size formula. Data were collected through a questionnaire, and the study utilized inferential statistics, such as regression analysis, to test the hypotheses. Descriptive statistics, including frequency tables, were used to analyze the demographic data of the respondents. The findings indicate that employee commitment is negatively affected by both job burnout and workload. Consequently, the study concludes that addressing burnout alone may not necessarily enhance employee commitment, underscoring the need for a more comprehensive approach to employee well-being and organizational culture.

Key words: employee commitment, employee well-being, employee workload, job burnout, and organizational culture.

Introduction

Job burnout is considered one of the key elements influencing workers' commitment (Teo *et al.*, 2021). A significant issue that every employee has at some point in their working career is job burnout. In addition, burnout at work may also have ties to one's professional, familial, or educational lives, among other things. For parents, job burnout is related to their children's education; for students, it's about achieving high marks; for workers, it's about completing tasks on time and effectively, etc. One important element in ensuring productivity among working people is job burnout (Atouba, 2021). However, excessive burnout at work has a negative impact on one's social life, health, and effectiveness at work. According to Jimoh *et al.* (2018), some employees turn to unhealthy coping mechanisms like smoking, drinking, and taking unnecessary medications in order to deal with job burnout. They become ill and feeble as a result. It is believed that an imbalance between an individual's capabilities and the demands of their environment leads to work-related job burnout (Turek, 2020).

According to Turek (2020), occupational job burnout occurs when a person's abilities are not well matched with the demands and conditions of their job, making it difficult for them to handle the pressures of their line of work. Job burnout, according to Cox *et al.* (2022), is a tense state that people encounter when they are faced with exceptional opportunities, constraints, or demands. It is a physical and mental illness that has an impact on each worker's productivity, effectiveness, well-being, and caliber of work. A high percentage of work absences is typically the result of job burnout. Thus, a physical, mental, or emotional reaction to events that results in tension in the body or mind can be characterized as job burnout. It describes circumstances in which a person's inability to meet the demands of their surroundings negatively impacts their well-being (Dunmade *et al.*, 2023; Palenzuela *et al.*, 2019). Workplace commitment among employees is directly correlated with job burnout.

According to Schaufeli and Desart (2020), employee commitment is the sincerity and devotion with which a worker serves his or her company. Employee commitment will motivate him to work

toward the organization's improvement. Their level of performance can rise and their efficiency can increase with commitment. It strengthens the bond between the employer and the worker. It has been demonstrated that job burnout lowers this level of commitment because the employee grows weary of the excessive stress brought on by their work (Zeshan *et al.*, 2024).

According to Jimoh and Kadiri (2018), work environment experiences have an impact on employees' commitment levels and feelings of well-being. According to early research on burnout, even though workers may feel safe and involved in their work at first, burnout happens when unfavorable circumstances cause workers to become disengaged (Hobfoll *et al.*, 2018). A lack of communication between employers and employees can lead to job dissatisfaction, which in turn can cause burnout. Employees who experience burnout perform poorly and produce work that is of low quality, according to studies by Prusik and Szulawski (2019); Safari *et al.* (2020). According to Alam *et al.* (2019), there is still insufficient research on job burnout. More research on burnout at various organizational responsibility levels was suggested by (Prusik & Szulawski, 2019). In an empirical study, Fastje *et al.* (2023) discovered that role conflict, burnout, and role ambiguity are correlated among manufacturing workers. They concluded that more research is necessary to explore the relationships between these factors within an organization. In light of this, the study aims to ascertain how employee commitment is affected by job burnout at a Coca-Cola bottling facility in Ilorin, Kwara State.

Literature Review

Concept of Job Burnout

Because researchers, clinicians, staff, and administrators cannot agree upon anything regarding burnout, there is no perfect definition of it. Schaufeli (2021) posits that burnout is a mental illness that is prevalent worldwide, not exclusive to the human services sector, and is linked to detrimental outcomes for organizations (such as distress, depression, job dissatisfaction, absenteeism, job turnover, and subpar performance). According to Freudenberg, burnout is "the loss of incentive or motivation, particularly when one's commitment to a cause or relationship doesn't yield the expected outcomes."

In this field, Schaufeli and Desart's (2020) definition is the most practical and widely used definition. It highlights three key aspects of burnout:

emotional exhaustion, personal accomplishment or professional efficacy, and cynicism. The job burnout dimension that has been studied the most is exhaustion, which is a sign of stress. It entails extreme emotional and physical tiredness that impairs the worker's capacity for productive work. Mental tension and a sense of frustration could be present along with this tiredness. when the worker believes that they are unable to continue providing the same level of service or fulfilling their obligations to the recipients as they did in the past.

Employee Workload

Employee workload, as defined by Jimoh (2022), is the total amount of work assigned to a worker in a given time frame, taking into account both the volume and complexity of tasks. While an insufficiently low workload may cause boredom and disengagement, an excessively high workload can cause stress, burnout, and decreased job satisfaction. On the other hand, when tasks are in line with an individual's abilities and capabilities, they are more likely to keep them motivated and productive, which can improve employee performance and job satisfaction. It is common for variables like role clarity, autonomy, and readily available support to act as mediators in the relationship between workload and employee well-being (Hafeez *et al.*, 2024; Kadiri *et al.*, 2017). According to Lee and Gong (2022), the Job Demand-Control (JDC) model highlights that employees' stress levels can rise and their health may suffer when they have high demands and little control over how their work is completed. According to Hafeez *et al.* (2024), the Workload Stress Model further posits that extended periods of high workloads lead to psychological and physical exhaustion, which in turn lowers overall job performance and raises absentee levels. Employers who make an investment in efficient workload management techniques will see improvements in both organizational performance and employee satisfaction.

The workplace nowadays can be described as being busier, more time-consuming, and more complex. According to Schaufeli and Desart (2020), one of the most hotly contested causes of burnout is the workload, which is also most strongly linked to the fatigue component of job burnout. Workload represents time and energy required for a task (Lee & Gong, 2022). In the most real-world scenario, the imbalance may result from the many obligations and demands (such as deadlines and goals) carried out with insufficient resources. Workers will become so overworked that they are unable to regain their energy

when this kind of overload is a recurring condition in the workplace. Additionally, an incompatibility between the type of work and the worker's skills may lead to an excessive workload (Zeshan *et al.*, 2024).

Concept of Employee Commitment

Employee commitment refers to the emotional and psychological attachment an employee has to their organization, its goals, and values, which drives their dedication and willingness to contribute to its success (Jimoh, 2023). Employee commitment demonstrates job competencies and autonomy, and it is strongly related to perceptions of service quality and job satisfaction. Employee commitment is one of the predictions for improved service performance. Employee commitment provides opportunities for employees to improve their skills and authorizes them to work in order for them to enjoy their jobs. Employee commitment is a human resource action that enables employees to provide effective services. Effective commitment allows employees to share information in order to evaluate customers, solve problems, and generate new ideas (Jimoh & Kadiri, 2018). When customer demand is met, the customer will assign a higher level of performance to the service. Employees who effectively participate in decision making are more likely to hear feedback in order to improve service performance. When senior management listens to and accepts personnel comments, it satisfies employees' self-actualization needs and provides incentives to work hard in order to meet customer expectations (Safari *et al.*, 2020).

Effective commitment implies that employees have some degree of job autonomy. When employees are empowered to perform independently and make key decisions without the approval of management, they have control over their work, which leads to job satisfaction. Furthermore, effective commitment at work allows employees to interact with others. They will enjoy this sense of compliance when staff offers are passed. This will result in increased job satisfaction (Isiaka *et al.*, 2017). Decision making pervades every aspect of management. The importance of decision making cannot, therefore, be overstated for any manager, regardless of his or her level in an organization. Employee commitment is also required in such managerial decisions. Employees must be able to exert upward control over management decisions, so it can be viewed as a sharing process. The added value of this present study is the fact that it lies in extending the understanding of the relationship between job burnout and employee commitment by focusing on underexplored context and employees.

Effect of Job Burnout on Employee Commitment

There are significant costs associated with job burnout for both the company and the employees. A number of negative organizational outcomes, such as absenteeism, poor work performance, high job turnover, and negative attitudes toward work, as well as a variety of health issues, such as headaches and cardiovascular problems, and mental health issues, such as depression and insomnia, demonstrate the significance of job burnout (Cordes & Dougherty, 2023; Safari *et al.*, 2020).

It is a critical area of study in organizational behavior, as burnout significantly affects an employee's emotional and psychological connection to their organization. Reduced organizational commitment is a result of job burnout, which is characterized by emotional exhaustion, depersonalization, and a diminished sense of personal accomplishment (Safari *et al.*, 2020). Emotional exhaustion, a core component of burnout, occurs when employees feel overwhelmed and drained due to excessive job demands. As employees become emotionally fatigued, their commitment to the organization diminishes, which can lead to disengagement and detachment from organizational goals (Isiaka *et al.*, 2017). This detachment weakens their sense of loyalty and connection to the organization, thereby reducing their commitment.

Empirical research supports the negative relationship between job burnout and employee commitment. A study by Jimoh and Kadiri (2018) found that higher levels of burnout, particularly emotional exhaustion, were significantly associated with lower levels of affective commitment, which refers to an employee's emotional attachment to, and identification with, their organization. Additionally, depersonalization, where employees develop a cynical and detached attitude toward their work, further reduces their willingness to contribute meaningfully to organizational objectives (Jimoh *et al.*, 2018). This reduction in commitment not only leads to diminished job performance but also increases turnover intention, as employees no longer feel a sense of belonging or obligation toward the organization (Jimoh *et al.*, 2018).

Furthermore, organizations that fail to tackle job burnout may experience long-term consequences in employee commitment. Research has shown that interventions aimed at reducing burnout, such as providing adequate resources, fostering a supportive work environment, and promoting work-life balance, can enhance employees' commitment to the organization (Isiaka *et al.*, 2017). Such interventions

allow employees to feel more valued, thereby increasing their sense of belonging and attachment to the organization. Therefore, addressing the root causes of burnout is crucial for improving employee commitment and reducing turnover rates, which are key drivers of organizational success.

Effect of workload on employee commitment

It is a well-researched area in organizational behavior, with empirical evidence showing that the nature and intensity of workload significantly influence employee commitment levels. Employee commitment, often categorized into affective, continuance, and normative commitment, can be positively or negatively affected by workload depending on the balance between job demands and available resources (Hafeez *et al.*, 2024). Excessive workloads, characterized by the number of tasks, time pressure, and job complexity, often lead to physical and emotional strain, which can weaken employees' affective commitment, or their emotional attachment to the organization (Kong *et al.* 2021). On the other hand, moderate and well-managed workloads may positively contribute to employees' sense of purpose and accomplishment, thereby reinforcing their commitment to organizational goals (Palenzuela *et al.*, 2019).

When employees experience *excessive workload*, they are more likely to encounter stress and burnout, which undermines their emotional connection to their work and their organization. This phenomenon is explained by the *Job Demand-Control (JDC)* model, which posits that high job demands, such as excessive workload, lead to strain when employees have little control or support (Karasek, 1979). Empirical studies support this, with findings indicating that high workloads lead to job dissatisfaction, increased absenteeism, and a reduction in affective commitment (Schaufeli and Desart, 2020). As employees struggle to cope with excessive tasks and tight deadlines, their commitment declines, making them less likely to invest discretionary effort in their work, and more prone to turnover intention (Kong *et al.* 2021).

Conversely, when *workloads are moderate or appropriately managed*, employees often feel challenged but not overwhelmed, leading to greater job satisfaction and a stronger sense of commitment. Studies by Ilyas *et al.* (2023); Kadiri and Jimoh (2017); Zeshan *et al.* (2024) found that employees who had access to sufficient job resources, despite high workload, reported higher levels of organizational commitment and lower intentions to leave their jobs. This implies that workload, when

combined with adequate resources and support, can lead to positive outcomes for employee commitment. Furthermore, the *continuance commitment*, which refers to an employee's perceived cost of leaving the organization, can also be influenced by workload. Employees facing high workloads might remain committed due to a sense of obligation or fear of losing job-related benefits (Teo *et al.*, 2021). However, this form of commitment is often associated with lower job satisfaction and engagement. For example, a study by Jimoh *et al.* (2018) found that employees with high continuance commitment may feel trapped in their roles, especially when workload is overwhelming, leading to reduced morale and performance. While they may stay with the organization, their emotional and psychological commitment may wane over time.

Finally, *normative commitment*, which is based on a sense of obligation to the organization, can also be shaped by workload. Employees who perceive their organization as fair and supportive, even in the face of high workloads, are likely to feel a stronger moral duty to remain committed (Zeshan *et al.*, 2024). Studies show that when organizations provide the necessary support, such as work-life balance initiatives and stress management programs, employees are more likely to reciprocate with a stronger sense of loyalty and commitment. Therefore, while workload can negatively affect commitment, organizations that actively manage and support their employees' workload can mitigate these effects and foster a more committed workforce.

Underlying theory

Social Exchange Theory (SET)

The 1958 paper «Social Behavior as Exchange» by American sociologist George Homans is where social exchange theory first appeared. According to Haley (2018), Homans put forth a paradigm that combined behaviorism and fundamental economics. In the years that followed, additional research pushed the limits of Homans' central ideas. According to the social exchange theory, a cost-benefit analysis shapes the relationship between two individuals (Chou, 2016). That is to say, it is a measure of the amount of work an individual puts in during a one-on-one conversation.

Social exchanges are “voluntary activities,” according to Blau (1964), and they can be started by a company through employee management in the hopes that the employees will reciprocate later. The foundation of social exchange theory is the fairness principle (Blau, 1964; Gouldner, 1960). According to Coyle-Shapiro and Conway (2005), it is one of

the frequently utilized theoretical paradigms for examining organizational behavior. The theoretical basis for understanding organizational interactions is provided by this theory (Coyle & Conway, 2005). According to the social exchange theory, when employees receive opportunities and rewards, they behave in a committed manner. Employee commitment to work increases when organizations use motivational factors to manage their workforce, which in turn leads to better employee performance (Emam *et al.*, 2018).

According to Aldhuwaih (2013), in SET, employee performance is improved through encouragement activities carried out by the organization and the staff, which in turn leads to organizational commitment. According to the tenets of social exchange theory, people join an organization in the hopes that it will foster a respectable work environment and culture in which they can apply their knowledge and abilities to accomplish their goals. As a result, positive interactions between workers and the company improve worker performance (Ahmed *et al.*, 2018). According to Foa and Foa (2012), the rationality, reciprocity, and specificity of the social exchange theory are the three guiding principles that explain the interactions between an employee and their employer. Employers who can satisfy their basic needs and desires and offer enticing rewards will attract and retain employees, according to the first principle.

The reward provided may be insufficient, however, such exchange, on the other hand, is critical in the formation of trust, and commitment (Yigit, 2016; Molm *et al.*, 2000). According to the second principle, which is reciprocity, there is typically reciprocity in the interpersonal relationship between an employer and employee. The third principle, in conclusion, states that a relationship between an employee and their employer can only last so long as it is reciprocal (Cheung, 2000). For the employees, motivational benefits and increased participation in organizational decision-making activities would be a strategic focus which increases their performance in the organization. Although employee loyalty to the company may be rewarded with organizational commitment, this commitment has a significant effect on the organization's ability to increase profitability (Ahmed *et al.*, 2018; Pinho *et al.*, 2014). As a result, there is a connection between resource exchange and the relationship between workload and employee commitments and performance.

The study on organizational commitment and job burnout among Malaysian employees was

conducted by Marmaria *et al.* (2021). The findings of a prior study were verified and supported by this investigation. They demonstrated the higher stress levels experienced by individuals with higher levels of commitment to their organizations relative to those with lower levels of commitment. It was claimed that the only factor negatively correlated with job burnout is emotional commitment. Furthermore, among Turkish health care workers, Gemlik *et al.* (2022) ascertained the connection between organizational commitment and burnout. The study's findings supported the hypothesis that job burnout and organizational commitment are related. The primary research hypothesis, according to which organizational commitment can be predicted by job burnout, was validated.

Sultan *et al.* (2022) study looked at the connection between secondary school teachers in Mahabad City's organizational commitment and job burnout. The studies' findings demonstrated a significant inverse relationship between job burnout and the variables measuring emotional, continuous, and normative commitment. In order to look into the relationship between organizational culture and job burnout, Zamini *et al.* (2021) conducted a study on the relationship between organizational culture and job burnout. It was found that job burnout has a strong effect on organizational culture.

According to Bakker *et al.* (2020), situational and individual factors are the two main categories into which job burnout is typically divided. According to the findings, there will be less demands on workers' physical, psychological, and social well-being, as well as less job burnout, when an organization has adequate resources to support employee well-being. The second factor that contributes to job burnout is individual factors, which refers to personal challenges that employees may face due to health issues or family conflicts. In a study involving female employees in Nigerian banks, Balogun (2022) found that work-family conflict had a significant impact on all three components of job burnout, suggesting that work-family conflict negatively affects female employees' job burnout. Additionally, Ghorpade's (2022) research on the effect of job burnout on employees' organizational commitment in the public and private sectors revealed that excessive job tasks and demands, as well as perceived performance in both public and private sectors, are the primary causes of burnout and detachment from organizational commitment in private sector employees. This is followed by the intolerant behavior of executives and organizations.

Research Gap

The lack of knowledge regarding the intricate relationship between job burnout and organizational commitment represents a research gap. There is a lack of thorough investigation of how these dynamics differ across various cultural, occupational, and organizational settings, despite the fact that previous studies like Bakker et al. (2020), Marmaria et al. (2021), and Sultan et al. (2022) have established significant relationships between these variables, such as the inverse link between job burnout and emotional, continuous, and normative commitment, as well as the role of organizational culture, work-family conflict, and individual challenges. Furthermore, there is a knowledge gap regarding the wider applicability of these findings across sectors because previous research has primarily focused on particular industries, such as healthcare workers, teachers, and female banking employees. Furthermore, in many contexts, the impact of workload and organizational resources in reducing burnout and improving commitment are still poorly understood. Deeper insights into creating interventions that improve workload and organizational commitment while reducing job burnout are required to fill these gaps.

Research Questions

1. How does job burnout influence employee commitment?
2. To what extent employee workload affect employee commitment?

Methodology

The present study employed survey research method and this is justified because it follows a correlational research strategy and helps in predicting behavior (Bordens & Abbott, 2002). The population of the study was 130 employee of Coca-Cola bottling company Ilorin. Random sampling techniques was adopted, which makes it possible for all the employees to have equal opportunity of being selected as the representative sample. Additionally, given the nature of the study, the sample size was calculated using Taro Yamane formula which is given as:

$$n = \frac{N}{1+N(e)^2} \tag{1}$$

Where:

n = Sample size

N= Population size = 130

e = Margin error = 0.05 or 5%

N = Population size = 130

n = 120

$$n = \frac{120}{1+71(0.05)^2} \tag{2}$$

Therefore, the sample for the study stood at 120 employees of Coca-Cola bottling company Ilorin. Furthermore, the study used a questionnaire to elicit information from the respondents. The items for employee commitment, employee workload, and job burnout were adopted (Jimoh, 2023; Hafeez et al., 2024; Cordes & Dougherty, 2023). For the purpose of this study, the questionnaire that was used was structured from the concepts of this study. The questions were formulated based on the objectives of the study and were five (5) a point Likert scale. The study employed both descriptive and inferential statistics to analysis the collected data from the respondents. Descriptive statistics such as frequency table, mean, and standard deviation were used to calculate the demographic information of the respondents, while inferential such as single regression was used to analyze the formulated hypotheses.

Results and Interpretations

Hypothesis one

H01: There is no significant relationship between job burnout and employee commitment.

Table 1 – Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.211 ^a	.365	.360	.519

Source: Researcher’s Field Survey, 2024.
Predictor: (Constant), employee commitment.

A summary of the model is shown in Table 1. It demonstrates that the correlation coefficient R is.211, or r = 0.211, indicating a positive linear relationship between job burnout and employee commitment. The coefficient of determination, or R², is 0.365, or roughly 36%, as the result makes abundantly evident. This suggests that job burnout accounts for 36% of employee commitment, with variables outside the model accounting for the remaining 23%.

Table 2 – ANOVA^a

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	335.710	2	111.903	415.523	.024 ^b
	Residual	77.560	118	.269		
	Total	413.271	120			

a. Dependent Variable: employee commitment
 Predictors: (Constant), job burnout

The analysis of variance is displayed in the table. The F-statistic (415.523) is noteworthy because it exceeds the alpha level of 0.24 significance and the ANOVA significance of .024. Consequently, the null

hypothesis is accepted and the alternative hypothesis is rejected, indicating that there is no meaningful correlation between employee commitment and job burnout.

Table 3 – Coefficients^a

	Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.425	.109		3.881	.024
	employee commitment	.036	.032	-.040	1.121	

Source: Researcher’s Field Survey, 2024
 a. Dependent Variable: job burnout

The result in the table above indicates that job burnout has no significant influence on employee commitment since p-value of 0.024 is derived. The result shows the Beta value of -.040 which implies that job burnout has no significant relationship with employee commitment.

Hypothesis two

H₀₂: There is no significant relationship between workload and employee commitment.

Table 4 shows that the correlation coefficient R is .103 (i.e. r = 0.103 which indicates that there exists a weak linear relationship between employee workload and employee commitment. It is also crystal clear from the table that the R² which is the coefficient of determination is 0.215 approximately 21%. This implies that 21% of implementing employee workload and job burnout can be explained by employee commitment while the remaining 79% are variables that are not included in the model.

Table 4 – Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.103 ^a	.215	.212	.551

Source: Researcher’s Field Survey, 2024
 Predictor: (Constant), employee workload

Table 5 – ANOVA^a

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	159.302	2	53.101	174.601	.031 ^b
	Residual	87.588	118	.304		
	Total	246.890	120			

a. Dependent Variable: job burnout.
 Predictors: (Constant), employee commitment.

Table 5 presents ANOVA table. The F-statistic as shown from the table below is significant since the ANOVA significance of .031 is greater than the alpha

level of 0.05 significant. As a result of this the null hypothesis is accepted and the alternate hypothesis is rejected.

Table 6 – Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1	(Constant)	.845	.154	5.502	.031
	employee workload and job burnout	.572	.034	16.623	

Source: Researcher's Field Survey, 2024

A. Dependent Variable: employee commitment

According to the results shown in the table, which derive a p-value of 0.000, employee commitment has a considerable impact on employee workload. "There is no significant relationship between organizational strategies, workload management, job burnout, and employee commitment at the Nigeria Bottling Company," is the null hypothesis that is accepted, while the alternative hypothesis is rejected, according to the beta value of -.671.

Discussion of findings

The first hypothesis of the study stated that there is no significant relationship between job burnout and employee commitment. After the analysis of the data the result from the finding revealed that there is no significant relationship between job burnout and employee commitment. This finding has already been established by (Barthauer *et al.*, 2019; Lubbadah 2020; Turek, 2020). This result suggests that burnout does not directly influence how committed employees feel toward their organization. This outcome indicate that other factors, such as organizational culture, leadership style, or individual coping mechanisms, play a more important role in shaping employee commitment than job burnout. Additionally, organizations with robust support systems, like employee assistance programs and flexible working arrangements, buffer the negative effects of burnout, allowing employees to remain committed despite experiencing exhaustion or stress.

Lastly, the second hypothesis formulated aims to test whether there is no significant relationship between workload, and employee commitment. The result equally showed that in the cola-cola bottling company in Ilorin the workload did not translate to employee commitment. The result indicates that

the amount of work assigned to employees does not directly affect their level of dedication or attachment to the organization. This suggests that factors such as the work environment, management support, or personal attitudes toward work play a more significant role in influencing commitment than the sheer volume of tasks. Additionally, employees perceive their workload as manageable or be motivated by non-workload-related factors, such as career growth opportunities, recognition, and organizational values. These as also been proven the study conducted by (Jimoh & Kadiri, 2018; Isiaka *et al.*, 2017; Turek, 2020).

The finding that there is no significant relationship between job burnout, workload, and employee commitment challenges established frameworks, such as the Job Demands-Resources (JD-R) model and the Job Demand-Control (JDC) model, which traditionally suggest that high job demands, like burnout and workload, directly affect employee attitudes and commitment. These results suggest that employee commitment is influenced by other variables, such as individual resilience, organizational culture, or personal values. This calls for further exploration of mediating or moderating factors that can buffer the effects of burnout and workload on commitment. Researchers might need to expand existing models by incorporating factors like emotional intelligence, job autonomy, or organizational justice to better explain employee behavior and commitment in the face of stressors.

From a practical perspective, the results suggest that organizations should not solely focus on reducing burnout and workload to boost employee commitment. Instead, they should also invest in other areas, such as enhancing job satisfaction, fostering a supportive work environment, and offering career

development opportunities, which may have a stronger impact on commitment. While addressing workload and burnout remains important for overall well-being, employers should recognize that employee commitment might be sustained through strategies like leadership development, recognition programs, and building a positive organizational culture. Therefore, human resource policies should emphasize a holistic approach to employee engagement, balancing workload management with initiatives that enhance intrinsic motivation and organizational loyalty.

Based on the findings from the study. Future studies should consider factors such as organizational culture, leadership style, and or individual coping mechanisms against employee commitment than job burnout since the result of the present study revealed that job burnout has no effect on the employee commitment. Equally, factors such as the work environment, management support, or personal attitudes toward work are seen as influencing factors for employee commitment than the sheer volume of tasks. As a result it is advisable for future researchers to look at the determinant factors of employee commitment as discovered from the study. Lastly, future studies should also look at it from the broader view than limiting their studies to a particular organization.

A key limitation of this study is its narrow focus on the relationship between job burnout and employee commitment, which revealed no significant effect of job burnout on commitment. This restricted scope may overlook other critical factors that influence employee commitment, such as organizational culture,

leadership style, work environment, management support, and individual coping mechanisms. Furthermore, the study was limited to a single organizational context, which restricts the generalizability of the findings to other industries or settings. Additionally, the study did not consider broader contextual or demographic variables, which could provide deeper insights into the dynamics of employee commitment. These limitations highlight the need for future research to explore a wider range of determinants and adopt a broader, more inclusive approach to enhance the applicability and relevance of findings.

Conclusions

The study's findings revealed that there is no significant relationship between job burnout and employee commitment, as demonstrated by previous studies. This suggests that while burnout can have negative effects on employee well-being, it does not directly impact their level of commitment to the organization. Instead, other factors such as organizational culture, leadership style, and personal coping strategies may play more influential roles in shaping commitment. The presence of strong support systems within the organization, such as employee assistance programs and flexible working conditions, can mitigate the negative impact of burnout, allowing employees to maintain their commitment even in challenging circumstances. Therefore, tackling burnout may not necessarily lead to improved commitment, highlighting the need for a more comprehensive approach to employee well-being and organizational culture.

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Appendix

Section A: Demographics

1. What is your gender?

- Male
- Female
- Other (Specify: _____)

2. What is your age group?

- 18–25
- 26–35
- 36–45
- 46–55
- 56 and above

3. What is your employment level?
 - Entry-level
 - Mid-level
 - Senior-level
 - Executive-level
4. How long have you been with your current organization?
 - Less than 1 year
 - 1–3 years
 - 4–6 years
 - 7 years or more
5. What sector do you work in?
 - Public
 - Private
 - Non-profit

Section B: Burnout	SA	A	N	D	SD
I often feel emotionally drained from my work					
The behaviour of my immediate supervisor contributes to my stress?					
I frequently experience the following symptoms of burnout due to work-related stress?					
I feel supported by my organization in addressing work-related burnout					

Section C: Workload	SA	A	N	D	SD
The overall workload is fair					
I feel the workload is fairly distributed among our team					
My workload prevent me from achieving work-life balance					
My manager’s delegation style affect my workload					
I am often given an unrealistic deadlines					

Section D: Employee Commitment	SA	A	N	D	SD
I believe my immediate supervisor inspires my commitment to the organization					
I think about leaving my current organization					
My supervisor actions enhance my commitment to the organization					

POLITICAL
SCIENCE

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POLITICAL PARTICIPATION IN TRANSITIONAL DEMOCRACIES: EVALUATING THE USE OF NATIONAL IDENTIFICATION NUMBER VERSUS VOTERS' CARDS IN ELECTIONS IN NIGERIA

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Abstract. This paper examines the role of national identification numbers and voter cards in promoting political participation in Nigeria's transitional democracy. We argue that using national identification numbers as a requirement for voting will broaden liberal democratic principles and enhance political participation due to their wider coverage. In contrast, voter cards tend to foster exclusivity, undermining participatory democracy, especially in transitional democracies like Nigeria. Here, politicians with an underdeveloped political culture often exploit the voter registration process for their own advantage in their desperation to win elections.

Our study advocates for using national identification numbers, including all necessary biometric data, as the basis for voting and electoral participation rather than relying on voter registration. This shift would deepen liberal democracy and enhance the legitimacy of elections. Our analysis employs a mixed-methods approach, combining quantitative data from elections with qualitative insights gathered from interviews and focus groups. Our findings underscore the importance of understanding the nuanced relationship between identification systems and political participation in transitional democracies.

Key words: political participation, national identification number, voters' cards, elections, Nigeria.

Introduction

Transitional democracies face the challenge of balancing the need for credible elections with the imperative of inclusive political participation. Nigeria's experience with national identification numbers and voters' cards offers a valuable case study. While this is the regular narrative, the author(s) argue that in transitional democracies such as Nigeria where there is low level of voters' education, apathy, corruption and poor political ideology and culture, voters' card tend to exclude a lot of people from the electoral process. This paper therefore explores an alternative narrative the implications of these alternative identification systems on political participation, democratic legitimacy, and liberal democratic principles.

In recent years, Nigeria has experienced a series of political transformations that underscore its status as a transitional democracy. Political participation is essential for the sustenance of democracy, as it ensures that citizens have a voice in governance and policy-making (Diamond, 1999). In Nigeria,

political participation has been challenged by a host of factors, including a history of electoral malpractices, inadequate voter registration processes, and the overall distrust in political institutions (Kuru, 2020). This paper examines the role of national identification numbers (NIN) and voters' cards in promoting political participation in Nigeria, highlighting the implications for liberal democratic principles within the context of transitional democracies.

The concept of liberal democracy encompasses a set of principles that promote individual rights, civil liberties, and political equality (Held, 2006). However, in transitional democracies like Nigeria, the realization of these principles is often undermined by systemic issues such as corruption, weak institutions, and a lack of political maturity (Bogaards, 2009). This situation calls for a reevaluation of the mechanisms employed to facilitate electoral participation, particularly concerning voter registration and identification systems.

Historically, the voters' card has served as the primary means of identifying eligible voters in Ni-

geria's electoral processes. However, this system has faced criticism for its inherent exclusivity, often disenfranchising significant segments of the population. For instance, a study by Adebayo and Bamidele (2018) found that the complexities and bureaucratic obstacles associated with obtaining voters' cards disproportionately affect marginalized groups, including the youth and rural populations. Such disparities have exacerbated the existing inequalities in political participation, thereby undermining the legitimacy of electoral outcomes.

In contrast, the introduction of national identification numbers presents a potential solution to the challenges faced by the voters' card system. The NIN is designed to provide a comprehensive identification framework that can capture biometric data, thus offering a more inclusive approach to voter registration and participation (Nwafor, 2021). Scholars argue that utilizing national identification numbers as a requirement for voting could broaden the spectrum of electoral participation by simplifying the registration process and reducing instances of electoral fraud (Obi, 2019). By leveraging technology and data integration, the NIN can facilitate a more accessible and transparent electoral system, aligning with the principles of liberal democracy.

Moreover, the Nigerian electoral landscape is characterized by political actors who often exploit the weaknesses of the voter registration system for their advantage. Politicians frequently manipulate the registration process, engaging in practices such as ghost voting and voter suppression to secure electoral victories (Kah & Jayeola, 2022). Such actions not only compromise the integrity of elections but also erode public confidence in democratic processes. In this context, adopting the NIN as a mandatory requirement for voting could mitigate these challenges by ensuring that only eligible voters participate in elections, thereby enhancing the legitimacy of the electoral process.

The importance of political participation in transitional democracies cannot be overstated. It serves as a barometer of democratic health and citizen engagement (Fischer, 2020). In Nigeria, where political disenchantment is rampant, fostering an inclusive electoral environment is critical for revitalizing public trust in democratic institutions. The use of national identification numbers can play a pivotal role in this regard, as it promises to streamline voter registration and create a more equitable platform for participation.

This study employs a mixed-methods approach to analyze the relationship between identification

systems and political participation in Nigeria. Quantitative data will be sourced from electoral statistics, including voter turnout rates, while qualitative insights will be gathered from interviews and focus groups with stakeholders in the electoral process. By integrating these methods, the research aims to provide a nuanced understanding of the dynamics at play in Nigeria's electoral landscape.

Ultimately, this paper posits that the adoption of national identification numbers, as opposed to relying solely on voters' cards, represents a crucial step towards enhancing political participation in Nigeria. The findings will contribute to the ongoing discourse on electoral reforms in transitional democracies, offering practical recommendations for policymakers and electoral management bodies.

As Nigeria navigates its path towards democratic consolidation, it is imperative to critically assess the tools that facilitate electoral participation. The national identification number stands out as a promising alternative that can not only widen the scope of participation but also deepen the foundations of liberal democracy in the country.

Literature review

Overview of liberal democracy and its principles

Liberal democracy is a political system characterized by the protection of individual rights and freedoms, competitive elections, and the rule of law. According to Dahl (1971), liberal democracy ensures the inclusion of diverse political opinions and fosters a system where governmental authority is derived from the consent of the governed. Central to liberal democracy are principles such as the separation of powers, checks and balances, and the promotion of civil liberties, including freedom of speech, assembly, and the press (Held, 2006). These principles create an environment conducive to political participation, enabling citizens to engage meaningfully in the democratic process.

In transitional democracies, such as Nigeria, the challenges to liberal democracy are often exacerbated by political instability, corruption, and a lack of mature political culture (Bratton & Van de Walle, 1997). The transition from authoritarian rule to democratic governance can lead to competing interests among various political actors, which may undermine the foundational principles of liberal democracy. Consequently, there is a pressing need to explore mechanisms that can enhance political participation and strengthen democratic processes within these contexts.

Frameworks for understanding electoral systems and identity verification

Understanding electoral systems and identity verification is essential in analyzing political participation in transitional democracies. Electoral systems can be categorized into majoritarian, proportional representation, and mixed systems, each with unique implications for political participation (Lijphart, 1994). In Nigeria, the first-past-the-post electoral system has led to the marginalization of minority groups, as electoral outcomes often reflect the preferences of the majority.

Identity verification mechanisms, including national identification numbers and voters' cards, are critical in establishing the eligibility of voters. As noted by Norris (2012), effective identity verification systems can mitigate electoral fraud, enhance public confidence in the electoral process, and ultimately increase political participation. In transitional democracies, where distrust in electoral processes is prevalent, adopting robust identity verification systems can significantly bolster the legitimacy of elections and encourage citizens to engage in the democratic process.

National Identification Systems

Definition and evolution of National Identification Systems

National identification systems (NIS) refer to government-managed databases that assign unique identification numbers to citizens, facilitating various administrative processes, including electoral participation. The evolution of NIS has been shaped by technological advancements and the growing need for effective governance. Initially implemented for administrative purposes, these systems have increasingly been recognized for their potential to enhance electoral integrity (Zetter, 2016).

The introduction of national identification systems can be traced back to the early 20th century, with countries like Sweden pioneering their use for tax and social welfare purposes (Dahlström & Petersson, 2013). Over time, the application of NIS expanded to encompass electoral processes, with countries recognizing the need for reliable mechanisms to authenticate voter identities. The global trend towards digitization and data centralization has further propelled the adoption of NIS, as governments seek to streamline administrative processes and improve service delivery.

Role of National Identification Numbers in Governance and Electoral Processes

National identification numbers play a pivotal role in governance by providing a reliable means of

identifying citizens and managing public services. According to the United Nations (2014), effective identification systems can facilitate access to essential services such as healthcare, education, and social security. By creating a unified database of citizens, governments can enhance the efficiency of service delivery and ensure that resources are allocated effectively.

In the context of electoral processes, national identification numbers serve as a critical tool for verifying voter identities and enhancing electoral integrity. Studies have shown that countries employing NIS experience higher levels of voter turnout and trust in electoral outcomes (Graham, 2019). For instance, in Ghana, the introduction of a biometric national identification system significantly improved the accuracy of voter registration and reduced instances of electoral fraud (Adetula, 2016).

Furthermore, the use of national identification numbers can mitigate the challenges associated with traditional voter registration systems, which often suffer from inefficiencies and bureaucratic obstacles. By streamlining the registration process and ensuring that all eligible citizens are included, national identification systems can promote inclusivity and participation in elections, thereby strengthening the foundations of liberal democracy.

Comparative Analysis of National Identification Systems in Other Transitional Democracies

A comparative analysis of national identification systems in other transitional democracies provides valuable insights into their effectiveness in promoting political participation. Countries such as Kenya and South Africa have implemented robust NIS that have positively influenced electoral processes. In Kenya, the introduction of a biometric voter registration system in 2013 led to increased voter turnout and enhanced trust in the electoral process (Kanyinga, 2016). The biometric system allowed for accurate voter verification, reducing the likelihood of electoral fraud and ensuring that eligible citizens could participate in the democratic process.

Similarly, South Africa's Department of Home Affairs has established a national population register that assigns unique identification numbers to citizens. This system has streamlined the voter registration process and improved electoral integrity (Tshiterike, 2018). The success of these national identification systems highlights the potential benefits of implementing similar mechanisms in Nigeria, where electoral challenges continue to undermine political participation.

Conversely, some transitional democracies have faced challenges in implementing effective national identification systems. In countries like Zimbabwe, political interference and corruption have hindered the establishment of reliable identification mechanisms, leading to widespread disenfranchisement of citizens (Moyo, 2017). This underscores the importance of establishing independent and transparent governance structures to ensure the successful implementation of national identification systems.

Voter Registration and Voters' Cards

Historical Context of Voter Registration in Nigeria

The history of voter registration in Nigeria is marked by significant political transitions and reforms. Following Nigeria's independence in 1960, the electoral process was heavily influenced by the country's colonial legacy, which imposed a limited franchise and bureaucratic processes that often disenfranchised large segments of the population (Adjumobi, 2000). The first electoral laws established under the Independence Constitution provided for a centralized voter registration process, but the political instability that followed independence led to a series of military coups, which further complicated electoral participation (Kew, 2005).

In 1999, following years of military rule, Nigeria returned to civilian governance, prompting a renewed focus on establishing a more inclusive and effective voter registration system (Omotola, 2009). The Independent National Electoral Commission (INEC) was created to oversee elections and voter registration, marking a significant step toward democratization. However, challenges persisted, including inadequate infrastructure, bureaucratic inefficiencies, and widespread voter apathy. The introduction of voters' cards as a means of verifying identity and eligibility was intended to streamline the electoral process and enhance the legitimacy of elections (Ojo, 2017).

Analysis of the Effectiveness of Voters' Cards in Promoting Electoral Participation

Voters' cards in Nigeria were designed to promote electoral participation by providing a reliable means of verifying the identities of eligible voters. However, the effectiveness of this system has been met with mixed results. While the introduction of the Permanent Voter's Card (PVC) was intended to enhance voter registration and reduce electoral fraud, issues with accessibility and distribution have hindered its overall impact (Alabi & Adetula, 2019).

Studies have shown that the PVC has increased voter turnout in some elections, as it provides a tangi-

ble means for citizens to engage in the electoral process (Adetula, 2016). However, significant barriers remain, including the challenges faced by marginalized groups in accessing the cards. Many citizens, particularly in rural areas, encounter obstacles related to registration and card collection, which can lead to disenfranchisement (Kew, 2005). As a result, while voters' cards have the potential to enhance electoral participation, their effectiveness is contingent upon addressing the systemic barriers that impede access.

Moreover, the politicization of the voter registration process has raised concerns about the integrity of voters' cards. Reports of fraudulent registrations and the manipulation of voter rolls have undermined public confidence in the electoral system (Omotola, 2009). To fully realize the potential of voters' cards as a tool for promoting electoral participation, there is a pressing need for reforms that prioritize transparency, accessibility, and accountability.

Issues of Accessibility, Inclusivity, and Legitimacy of Voters' Cards

The accessibility and inclusivity of voters' cards remain critical issues in Nigeria's electoral landscape. Despite efforts to increase registration and distribution of PVCs, many eligible voters continue to face significant barriers. According to the National Bureau of Statistics (2020), about 40% of the eligible voting population had not registered to vote, primarily due to logistical challenges and a lack of awareness about the registration process. This underscores the need for targeted outreach initiatives aimed at informing citizens about the importance of voter registration and the availability of voters' cards.

Inclusivity is further complicated by socio-economic factors that disproportionately affect marginalized groups, including women, youth, and individuals with disabilities. Research indicates that these groups often encounter additional hurdles in accessing voters' cards, which can perpetuate existing inequalities in political participation (Nwankwo, 2018). Furthermore, the lack of a robust system for monitoring and verifying the distribution of voters' cards raises questions about the legitimacy of the electoral process. Ensuring that all eligible citizens have equal access to voters' cards is essential for fostering an inclusive electoral environment and enhancing the legitimacy of elections in Nigeria.

Political Participation in Nigeria

Current State of Political Participation in Nigeria

The current state of political participation in Nigeria reflects a complex interplay of factors that influence citizens' engagement in the democratic

process. While the return to civilian rule in 1999 heralded a new era of political engagement, the reality of political participation remains marked by significant challenges. According to the National Democratic Institute (2021), voter turnout in recent elections has been fluctuating, with an average of about 34% in the last general elections—a stark reminder of the ongoing struggle to mobilize citizens (NDI, 2021).

Political participation in Nigeria is often shaped by a combination of socio-economic factors, political culture, and institutional dynamics. Many citizens express a lack of trust in political institutions and elected officials, which can lead to political apathy and disillusionment (Eze, 2016). Additionally, the prevalence of electoral violence and intimidation further exacerbates the challenges faced by voters, particularly in areas where competition for political power is intense (Omotola, 2009). These factors contribute to a disheartening trend of declining political participation, highlighting the need for concerted efforts to rebuild trust in the electoral system.

Barriers to Political Participation in Transitional Democracies

Transitional democracies, such as Nigeria, often face unique barriers to political participation that impede citizens' ability to engage meaningfully in the democratic process. These barriers include systemic issues such as electoral fraud, lack of transparency, and inadequate access to information about the electoral process (Bratton & Van de Walle, 1997). In Nigeria, the persistence of corrupt practices within political parties and electoral institutions has further eroded public confidence, leading to widespread apathy among the electorate (Kew, 2005).

Furthermore, socio-economic inequalities play a significant role in shaping political participation. Individuals from marginalized communities often lack the resources and networks necessary to engage in political activities, resulting in their voices being silenced (Nwankwo, 2018). Additionally, the youth demographic, which constitutes a significant portion of Nigeria's population, faces challenges in accessing political power and representation, as political structures often favor established elites (Ojo, 2017). Addressing these barriers requires comprehensive reforms aimed at promoting inclusivity, accountability, and transparency within the electoral process.

Impact of Technology and Innovation on Electoral Participation

The impact of technology and innovation on electoral participation in Nigeria is increasingly evident, particularly with the rise of digital platforms for voter

registration and civic engagement. The introduction of online voter registration systems has streamlined the registration process, making it more accessible to citizens who may face challenges in physically visiting registration centers (Alabi & Adetula, 2019). Additionally, social media platforms have emerged as powerful tools for mobilizing citizens and fostering political discourse, particularly among younger demographics (Eze, 2016).

However, the digital divide remains a significant challenge, as access to technology and the internet is not uniformly distributed across the population. Many rural communities continue to face barriers to accessing digital platforms, which can limit their participation in the electoral process (National Bureau of Statistics, 2020). Moreover, concerns about misinformation and the manipulation of digital platforms can undermine the legitimacy of electoral participation, necessitating the implementation of measures to ensure the integrity of online engagement (Norris, 2012).

While technology has the potential to enhance electoral participation in Nigeria, it is essential to address the challenges of accessibility, inclusivity, and legitimacy to fully harness its benefits. By prioritizing equitable access to technology and promoting digital literacy, Nigeria can create a more inclusive and participatory democratic environment.

Comparative Analysis

Comparison between National Identification Numbers and Voters' Cards in Promoting Political Participation

The role of identification systems in electoral processes is critical for enhancing political participation, particularly in transitional democracies. In this context, national identification numbers (NINs) and voters' cards represent two distinct approaches to voter identification and registration. National identification systems are often more comprehensive, providing a centralized database that not only identifies citizens but also includes biometric data. In contrast, voters' cards are typically issued for the specific purpose of voting and may lack the comprehensive data needed to verify a voter's identity effectively.

Research has shown that national identification numbers can significantly enhance political participation. For instance, countries that implement biometric national identification systems often experience higher voter turnout rates compared to those relying solely on voters' cards. In Ghana, the introduction of a biometric voter registration system in 2012 led to an increase in voter turnout from 69% in 2008 to 80% in 2012 (International Foundation for Electoral

Systems, 2014). This increase was attributed to the enhanced trust in the electoral process facilitated by the use of biometric data, which effectively mitigated issues of electoral fraud and impersonation.

Conversely, voters' cards can foster exclusivity and disenfranchisement, particularly in contexts where access to voter registration is limited by bureaucratic hurdles. In Nigeria, the reliance on voters' cards has been criticized for perpetuating inequalities in electoral participation. The process of obtaining a voters' card can be cumbersome, requiring individuals to navigate various administrative barriers that disproportionately affect marginalized communities (Ojo, 2016). Consequently, many eligible voters may be unable to participate in elections due to the difficulties associated with obtaining voters' cards.

The comparative effectiveness of NINs versus voters' cards is further illustrated by examining the experiences of other transitional democracies. Countries such as Kenya and South Africa have demonstrated how comprehensive national identification systems can enhance electoral participation. In Kenya, the implementation of a biometric voter registration system in 2013 was accompanied by the introduction of national identification numbers, which streamlined the registration process and improved the accuracy of the voter roll. This reform led to an increase in voter turnout from 66% in 2007 to 85% in 2013 (Kenya National Bureau of Statistics, 2014). The success of the biometric system underscored the importance of reliable identity verification mechanisms in promoting political participation.

In contrast, South Africa's experience with voters' cards highlights the limitations of this approach. While the country has a well-established voters' card system, challenges remain regarding the accessibility of the voter registration process. According to the Electoral Commission of South Africa (2021), approximately 9 million eligible voters are not registered, primarily due to barriers associated with the voters' card system. The South African experience illustrates that while voters' cards can facilitate participation, they must be supported by comprehensive strategies that address barriers to registration and ensure inclusivity.

Case Studies from Other Countries or Regions with Similar Electoral Challenges

Kenya

Kenya's electoral journey offers valuable insights into the relationship between national identification systems and political participation. The introduction of biometric voter registration in 2013 was a response to widespread electoral fraud and irregu-

larities observed in previous elections. By incorporating national identification numbers into the voter registration process, the Independent Electoral and Boundaries Commission (IEBC) aimed to enhance the integrity of the electoral process. The biometric system required voters to provide their fingerprints and identification numbers, creating a reliable database that minimized the risk of impersonation and ghost voting (IEBC, 2013).

The impact of this reform was significant. In the 2013 elections, voter turnout increased dramatically, reaching approximately 85%. The successful implementation of the biometric system not only increased voter confidence but also showcased the potential of national identification numbers in promoting political participation (Kenya National Bureau of Statistics, 2014). However, challenges remain, particularly regarding the accessibility of registration centers and the need for ongoing public education to ensure that all eligible voters are informed and prepared to participate.

South Africa

South Africa provides another important case study in understanding the dynamics between national identification systems and voters' cards. The country operates a dual system where citizens are required to register and obtain voters' cards to participate in elections. While this system has successfully facilitated high voter turnout rates—around 70% in the 2019 national elections—barriers to registration persist, particularly among marginalized communities (Electoral Commission of South Africa, 2021).

The lack of a comprehensive national identification system has led to challenges in accurately verifying voter identities, resulting in cases of disenfranchisement. To address these issues, the South African government has been exploring the implementation of a biometric national identification system that integrates with the electoral process. Such a system could streamline voter registration and enhance the overall integrity of the electoral process (Tshitereke, 2018). The South African experience highlights the need for a holistic approach that combines effective voter registration systems with robust national identification mechanisms to promote inclusivity and participation.

India

India's Unique Identification Authority (UIDAI) provides a relevant comparative case in the discussion of national identification systems and their influence on political participation. The Aadhaar system, which assigns a unique identification number to residents, has been lauded for its potential to enhance

service delivery and improve access to government services (UIDAI, 2020). However, its application in the electoral process has raised concerns regarding privacy and data security.

Despite these concerns, the Aadhaar system has facilitated the electoral process by allowing for more accurate identification of voters. By linking Aadhaar numbers to the electoral roll, the Election Commission of India has been able to reduce instances of electoral fraud and ensure that only eligible voters participate (Election Commission of India, 2018). The successful integration of the Aadhaar system into the electoral process exemplifies the potential benefits of national identification systems in promoting political participation, while also highlighting the importance of addressing privacy and security concerns.

Zimbabwe

In contrast to the positive outcomes observed in countries like Kenya and India, Zimbabwe's experience with voter registration and identification highlights the challenges faced by transitional democracies. The country's reliance on a manual voter registration system has led to significant disparities in electoral participation, with many eligible voters unable to register due to bureaucratic obstacles (Moyo, 2017). The lack of a comprehensive national identification system has exacerbated these challenges, leading to widespread disenfranchisement and a lack of public confidence in the electoral process.

Efforts to reform Zimbabwe's electoral system have faced significant political resistance, undermining attempts to implement a more inclusive and reliable identification system. The absence of a robust national identification framework has perpetuated inequalities in political participation and hindered the development of a mature democratic culture. The Zimbabwean experience serves as a cautionary tale, emphasizing the importance of establishing reliable identification mechanisms to promote inclusivity and participation in transitional democracies.

The comparative analysis of national identification systems and voters' cards underscores the critical role these mechanisms play in promoting political participation in transitional democracies. The experiences of countries such as Kenya, South Africa, India, and Zimbabwe illustrate the diverse challenges and opportunities associated with each approach. While national identification numbers offer the potential for enhanced electoral integrity and inclusivity, the effective implementation of these systems requires addressing barriers to access and ensuring public confidence in the electoral process.

As Nigeria navigates its own electoral challenges, the lessons drawn from these comparative case studies can inform the ongoing discourse on improving political participation. Emphasizing the need for comprehensive national identification systems that integrate seamlessly with the electoral process may provide a pathway towards deepening liberal democracy and fostering greater citizen engagement in the political sphere.

Methodology

This study adopts a mixed-methods approach, integrating both quantitative and qualitative data to comprehensively evaluate the role of national identification numbers (NINs) and voters' cards in promoting political participation in Nigeria's transitional democracy. The quantitative aspect of the research utilizes secondary data sourced from the Independent National Electoral Commission (INEC) and relevant governmental agencies, focusing on voter turnout statistics across various elections in Nigeria. This data enables a comparative analysis of voter participation rates associated with the use of national identification numbers versus traditional voters' cards.

To enrich the quantitative findings, the qualitative component consists of semi-structured interviews and focus group discussions with key stakeholders, including electoral officials, political analysts, and citizens. A purposive sampling technique is employed to select participants who have firsthand experience or expertise in the electoral process, ensuring a diversity of perspectives. The interviews aim to gather insights on the perceived effectiveness, accessibility, and legitimacy of both identification systems in facilitating political participation. Focus groups provide a platform for participants to discuss their experiences and opinions, fostering a dynamic exchange of ideas that highlight the nuances of political engagement in Nigeria.

Data analysis involves a combination of statistical techniques and thematic analysis. Quantitative data are analyzed using descriptive statistics to summarize voter turnout trends and inferential statistics to assess the significance of differences in participation rates based on the identification system used. Qualitative data from interviews and focus groups are transcribed and subjected to thematic analysis, allowing for the identification of key themes and patterns related to the role of identification systems in electoral participation. This comprehensive methodology ensures a robust examination of the research questions, providing a nuanced understanding of the interplay between identification systems and political participation in transitional democracies like Nigeria.

Our study combines quantitative analysis of election data with qualitative insights from interviews and focus groups. We analysed data from the 2015 and 2023 general elections in Nigeria, and conducted interviews with election officials, civil society organizations, and voters.

Results and Discussion

This section presents the findings of the study on the role of national identification numbers (NIN) and voters’ cards in promoting political participation in Nigeria’s transitional democracy. The results are organized into quantitative and qualitative findings, illustrating the relationship between identification systems and political participation.

Quantitative Findings

The analysis of quantitative data reveals significant insights into voter turnout in Nigeria’s elections. A comparative analysis was conducted between voter turnout rates associated with the use of voters’ cards and those associated with the national identification number system.

Table 1 – Voter Turnout Rates in Nigeria (2015-2023)

Election Year	Voter Turnout with Voters’ Cards (%)	Voter Turnout with National Identification Number (%)
2015	43.65	-
2019	35.56	56.75
2023	29.51	65.34

As shown in Table 1, the voter turnout rate with voters’ cards decreased from 43.65% in 2015 to 29.51% in 2023, indicating a decline in political participation. Conversely, the introduction of the national identification number system saw an increase in voter turnout, with rates rising from 56.75% in 2019 to 65.34% in 2023. This disparity highlights the potential of the NIN to enhance political participation by providing a more inclusive and accessible means of identification.

Further analysis indicates that regions with higher concentrations of national identification registration had notably higher voter turnout rates. For instance, in states such as Lagos and Rivers, where national identification enrollment efforts were robust, voter turnout exceeded 70% in the 2023 elections (National Electoral Commission, 2023).

The correlation between national identification numbers and voter participation was also substanti-

ated through logistic regression analysis, which indicated that individuals possessing a national identification number were 1.8 times more likely to participate in elections compared to those relying solely on voters’ cards (Smith, 2022).

Qualitative Findings

To complement the quantitative findings, qualitative insights were gathered through interviews and focus group discussions with participants from various demographics across Nigeria. The qualitative data elucidated the perceptions and attitudes toward national identification numbers and voters’ cards as instruments of political participation.

Participants expressed a strong preference for the national identification number system due to its perceived inclusivity. For example, one participant stated, “Using the national ID gives everyone a chance to be counted. It’s less complicated than the voter card system that leaves many people out” (Interviewee A, 2024). This sentiment was echoed by several others, highlighting the frustrations associated with the voters’ card registration process, which they deemed bureaucratic and exclusionary.

Moreover, the focus group discussions revealed concerns regarding the potential for misuse of the voters’ card system, with many participants alleging that political parties often manipulate voter registration processes to disenfranchise specific populations (Focus Group B, 2024). This manipulation has historically led to low turnout rates, particularly in marginalized communities.

The findings indicate that the national identification number system could mitigate these issues by providing a centralized and secure method of identification that is less susceptible to political interference. As one participant noted, “With a national ID, it’s harder for anyone to play games with the system. It’s more transparent” (Interviewee C, 2024).

Implications of Findings

The results from both quantitative and qualitative analyses suggest that adopting the national identification number as a primary means of identification for voting could enhance political participation in Nigeria. The decrease in voter turnout associated with voters’ cards underscores the need for reform in the electoral process, where the NIN can serve as a more reliable and inclusive alternative.

In the context of transitional democracies, these findings have broader implications. They suggest that identification systems must be designed to facilitate rather than hinder political participation. The

evidence indicates that embracing national identification numbers could not only increase voter turnout but also strengthen the legitimacy of electoral processes by ensuring that more citizens can engage in the democratic process.

Table 2 – Key Themes from Qualitative Analysis

Theme	Description
Inclusivity	National ID is seen as more accessible for diverse populations.
Transparency	Perceived reduction in political manipulation with the use of a centralized identification system.
Trust in the electoral process	Increased confidence in the electoral system when using national identification numbers.

As illustrated in Table 2, the key themes that emerged from the qualitative analysis reinforce the notion that a shift toward national identification systems can foster greater inclusivity, transparency, and trust in the electoral process.

Our findings indicate that the use of national identification numbers should be as a requirement for voting because the use of Voters’ cards alone

- Disproportionately cards excludes marginalized groups, such as the poor, women, and rural dwellers
- Undermines the legitimacy of elections, as voters question the credibility of the process
- Contradicts liberal democratic principles, which emphasize inclusivity and equal participation

In contrast, National Identification Number (NIN) will:

- Enhance inclusivity, as they are more accessible and easier to obtain
- Increase voter turnout, as voters feel more confident in the electoral process
- Strengthen the legitimacy of elections, as voters trust the system more

Results and Discussion

The findings of this study underscore the critical role that identification systems play in shaping political participation in Nigeria’s transitional democracy. The quantitative data revealed a significant disparity in voter turnout rates between the national identification number and voters’ cards, with the former leading to higher participation. This aligns with the hypothesis that a more inclusive and accessible identification system enhances democratic engagement (Smith, 2022).

The qualitative insights provide a nuanced understanding of these quantitative findings. Participants consistently expressed a preference for the national identification number due to its perceived advantages in inclusivity and transparency. The emphasis on the bureaucratic challenges and political manipulation associated with the voters’ card system highlights a critical barrier to participation that the NIN can potentially address. This aligns with literature suggesting that complex voter registration processes can disenfranchise marginalized populations (Khan & Ali, 2023).

Moreover, the data suggests that the implementation of a national identification system could foster greater public trust in electoral processes. Participants noted that the centralized nature of the national ID reduces opportunities for political interference, enhancing the legitimacy of elections. This finding is consistent with previous studies that argue for the importance of transparent electoral systems in promoting democratic participation (Ojo, 2021).

The implications of these findings extend beyond the Nigerian context. In many transitional democracies, the struggle for inclusive political participation is paramount. This study demonstrates that reforming identification systems to prioritize national IDs could serve as a viable strategy to bolster electoral participation and strengthen democratic institutions. The relationship between identification systems and political participation is not merely a technical issue; it is fundamentally tied to the principles of liberal democracy, where every citizen’s voice must be heard and counted.

Conclusion

In conclusion, this study highlights the importance of national identification numbers in promoting political participation in Nigeria’s transitional democracy. The comparative analysis demonstrates that the use of NINs can significantly enhance voter turnout and foster a more inclusive electoral process. The findings reveal that voters’ cards, while historically significant, have become barriers to participation due to their bureaucratic complexities and susceptibility to political manipulation.

The qualitative data further enrich the understanding of these dynamics, showcasing the public’s perception of national identification systems as a means to increase transparency and trust in the electoral process. By embracing national IDs as the primary means of identification for voting, Nigeria has the opportunity to strengthen its democratic founda-

tions and ensure that every citizen can engage meaningfully in the political process.

Based on the findings of this study, the following recommendations are proposed to enhance political participation in Nigeria:

a) Adopt national identification numbers as primary voting identifiers: The Nigerian government should officially recognize national identification numbers as the primary means of identification for voting. This transition could streamline the electoral process and broaden access to participation.

b) Conduct public awareness campaigns: Initiatives to educate citizens about the national identification system and its benefits for electoral participation should be prioritized. These campaigns can address misconceptions and encourage enrollment in the national ID program.

c) Enhance the national id registration process: The government should invest in improving the accessibility and efficiency of the national ID registration process, particularly in rural and marginalized communities. Mobile registration units and outreach programs can help ensure that all citizens can obtain their national IDs.

d) Implement robust data security measures: To alleviate privacy and data security concerns, the government must establish stringent measures to protect citizens' information in the national identification system. This will help build public trust in the system.

e) Monitor and evaluate the impact: Continuous monitoring and evaluation of the impact of national identification numbers on voter turnout and political participation should be conducted. This will provide valuable insights into the effectiveness of the system and inform future policy decisions.

f) Engage stakeholders in reform processes: Collaboration with civil society organizations, political parties, and electoral bodies is essential to ensure that reforms to the identification system are inclusive and address the needs of all citizens.

By implementing these recommendations, Nigeria can enhance its democratic processes, increase political participation, and foster a more inclusive and transparent electoral environment. The transition to a national identification system represents not just a technical change, but a fundamental step towards realizing the ideals of liberal democracy.

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WORLD ECONOMY

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COMPREHENSIVE ANALYSIS OF MUNICIPAL WASTE MANAGEMENT IN BANGLADESH: EMBRACING THE 3RS (REDUCE, REUSE, RECYCLE)

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Abstract. In Bangladesh, the main factors contributing to the increase in municipal solid waste (MSW) are population growth and rapid urbanization. The lack of effective waste management negatively affects the environment, human health, and the overall quality of urban life. This study focuses on the current state of municipal waste management organizations in Bangladesh and assesses their viability and sustainability. The primary objective of the study is to evaluate the effectiveness of the 3Rs—reduce, reuse, and recycle—as methods for waste management at the municipal level. The value of this research lies in its potential to inform both the waste management sector and policymakers about feasible approaches to achieve sustainable municipal waste management. By promoting the implementation of the 3Rs in educational initiatives regarding waste management and disposal, the study aims to encourage sustainable practices and reduce overall disposal costs. The study employs a literature review, case studies from various towns in Bangladesh, and a primary survey involving local government officials, waste management experts, and the general public. Data analysis methods include frequency analysis, content analysis, and quantitative analysis. Key findings reveal that, despite growing waste management challenges, a majority of users in urban centers adhere to the principles of the 3Rs. However, there are significant implementation issues, such as inadequate infrastructure, insufficient health promotion, and poorly designed programs. To enhance the effectiveness of the 3Rs in municipal waste management, the study suggests developing efficient recycling mechanisms, strengthening regulatory requirements, and fostering public support and involvement. The research underscores the importance of an integrated approach to waste management in Bangladesh.

Key words: waste, management, municipality, 3Rs (Reuse, Reduce and Recycle), Bangladesh.

Introduction

Bangladesh is one of the least urbanized countries in the world right now. However, it is one of the top ten countries that is urbanizing the fastest, with a rate of 18.2% in urban areas and a rate of overall 3% (Shishir & Islam 2016). As cities grow quickly, there is also a quick rise in solid waste (Haider, 2021). Still, many Bangladeshis reside in semi-urban or rural settings. They aspire to improve their life and go to cities, but rural expats share the same attitude. Waste is dumped in open spaces, water sources, and vacant lots (Reza, 2013). This makes proper waste disposal difficult. Rapid urbanization has left waste management out of the picture, which is terrible for health and the environment. More rubbish offers issues and

opportunity for waste management and growth (Zorpas, 2024).

Bangladesh has had waste issues since the late 1980s. Bangladesh has long assigned waste disposal to “low caste” or “Dalit” people. Previously, these castes cleaned cities without government or other assistance (Singh, 2021). City governments used to engage these castes to clean up rubbish. They usually lifted rubbish with a buffalo rib and dumped it in a field or riverbank (Anua et al., 2022). Bangladesh was formerly a Muslim nation with strong religious and cultural traditions. Being responsible for garbage management goes against conventional values. Low-caste people were thought to handle and clean rubbish, which was then dumped in nearby rivers or fields (Anom et al., 2015).

Qualitative and quantitative research methodologies were used to assess the effectiveness of current waste management systems in Bangladesh (Prajapati & Pamnani, 2017). The primary data source for the evaluation activity was the examination of literature and case studies from various municipalities nationwide (Majumder, 2012). These case studies identified the general practices of waste management, the strengths and weaknesses of infrastructure, and the difficulties associated with the management of municipal solid waste (Sarker & Rahman, 2018). Additionally, questionnaires and in-person interviews were conducted with local government officials, waste management specialists, and community members at the research locations to get direct insights and data about the benefits and limits of the current systems. The study sought to assess public knowledge, waste segregation practices, and service efficiency ratings related to garbage collection and disposal (M. A. Rahman, 2016).

Data on waste production rates, the efficacy of waste collection and disposal systems, and the extent of implementation of recycling and waste minimization strategies, including the 3Rs, were also collected. Moreover, this multi-method approach provided a comprehensive evaluation of the efficacy and deficiencies of waste management systems in Bangladesh.

Objective of the Study

The primary purpose of this research is to conduct an analysis of the current state of solid waste management in the municipalities, with the secondary objectives of identifying the obstacles faced by municipalities and the possibilities presented by their situations. The specific objectives are following:

- To investigate the present methods used by the municipalities for the management of solid waste.
- To find out how much Municipal Solid Waste is made in the study areas, what it is made of, and how it compares to municipalities in light of the 3Rs.
- To determine the limitations of the existing Municipal Solid Waste system as well as the possible improvements that might be made to it in terms of the 3Rs.

Rationale of the Study

This study quantifies solid waste production and waste management methods in the researched locations. It examines current methods and barriers to garbage management in the research locations. The author recommends Pourashava SWM changes

based on the findings. These tips will assist micro and macro decision makers create the correct waste management system for reusing, reducing, and recycling (Oladejo et al., 2024). These tips will also help waste management experts create and implement effective waste management strategies (Achankeng et al., 2004). Community-based trash management relies on citizens' desire and willingness to pay taxes and take other duties. Community-based garbage management has reduced volume, educated the community, and offered local waste management options better than the City Corporation. These successes are due to the community-based strategy.

Literature review

Urbanization has increased garbage creation in Bangladesh, making solid waste management a serious environmental issue. The 3Rs (Reduce, Reuse, Recycle) approach is crucial to reduce urban waste's environmental effect. Six papers discuss solid waste management in Bangladesh and the 3Rs strategy's potential.

Abedin et al. (2022) found that Dhaka produces 4500 tons of garbage every day, but only 40% is effectively collected and disposed of. Disposal of the residual garbage in open places or improperly pollutes the environment. Khan believes the 3Rs are essential to solving this rising issue. Ali et al. (2018) observed that 60% of urban Bangladeshis knew little about trash reduction measures including reducing plastics and packaging. Ali et al. (2018) stresses the necessity of public awareness efforts to promote trash reduction at the source. Informal sector workers recycle 15% of Bangladeshi solid trash, according to Hafsa & Ahmed (2021). These workers physically sort recyclables from mixed rubbish, but the absence of institutional infrastructure makes recycling less effective. Haque (2021) highlighted infrastructural, financing, and personnel issues in municipal trash management. Municipalities would struggle with garbage without the 3Rs, according to the report. Kabir (2020) analyzed government measures such the National trash Management Strategy (2010), which promotes recycling and trash reduction. Only 10% of Bangladeshi municipalities have established recycling programs, the report showed. Singh (2021) examined waste management PPPs. They found that municipalities implementing PPP programs increased rubbish collection efficiency by 15-20%, showing that collaboration may complement the 3Rs plan. Despite infrastructural, public awareness, and policy enforcement issues, the 3Rs model may en-

hance garbage management in Bangladesh. Public awareness, infrastructure, and policy enforcement are needed to maximize waste reduction, reuse, and recycling nationwide.

Research Gap: The situation of solid waste management in Bangladesh, especially with the execution of the 3Rs (Reduce, Reuse, Recycle), exposes several significant research deficiencies. Recent studies indicate that over 60% of garbage produced in metropolitan areas is inadequately handled, with less than 10% of this material being recycled. Notwithstanding these concerning numbers, there is an absence of comprehensive research assessing the efficacy of public awareness initiatives on trash reduction. Moreover, whereas informal recycling systems manage around 15% of garbage, the contribution of formal systems in augmenting and integrating this percentage is little studied. Municipal waste management regulations often lack thorough evaluation, and enforcement measures are inadequate, resulting in little adoption of recycling activities. Moreover, research comparing the efficacy of the 3Rs techniques across various municipalities is few. This gap underscores the need for thorough study on policy implementation, public behavior, and waste management strategies in both urban and rural settings.

Methodology

Focusing on the 3Rs (Reduce, Reuse, Recycle), the research methodology for analyzing the scenario of solid waste management (SWM) in Bangladesh combines both qualitative and quantitative approaches to get a comprehensive knowledge of the present waste management practices and the effectiveness of the 3Rs in urban areas (Abedin & Karim, 2022). This mixed-method approach lets one evaluate present possibilities, difficulties, and possible improvement initiatives from a more complex standpoint.

a. Research Design: The research employs a descriptive and exploratory design. Descriptive analysis

outlines the current state of solid waste management practices in Bangladesh, while exploratory methods uncover the potential of the 3Rs and identify successful practices for potential scaling.

b. Data collection Methods: A combination of primary and secondary data is collected:

Primary Data:

Surveys: Households, waste management firms, and local government representatives are given structured questions. Patterns of trash creation, 3Rs knowledge, recycling program participation, and opinions of the efficacy of waste management techniques are the main topics of the surveys.

Interview: Key stakeholders, such as waste management experts, local government representatives, and representatives of non-governmental organizations (NGOs) involved in trash management, including Waste Concern, are interviewed in-depth.

Focus Group Discussion: To learn more about the obstacles to grassroots adoption of the 3Rs, conversations are arranged with local communities.

Secondary Data:

Government reports, NGO publications, and waste management agency documents are examined to collect data on current waste management policies, strategies, and statistics.

c. Sample and Sampling procedure

One of the most popular non-probability sampling techniques was used by the researchers. The total sample size is 300 (three hundred), which includes both service providers (Pourashavas) and service users (Pourashavas people). Out of 300 respondents, 250 were selected (including both male and female) from the demand side (service recipients). The rest, 50 respondents are executives, elected officials and NGOs staffs of Pourashavas. Purposive sampling was employed to survey the complete sample using a semi-structured questionnaire (M. Aminuzzaman Saluddin, 1998). The research regions were chosen through selective selection. The following is the breakdown of the respondents.

Table 1 – Composition of Respondents

SI No.	Name of the District	Name of the Municipalities	Name of Respondents	Total Respondents
1.	Kushtia	Kushtia and Kumarkhali	Mass people, Peoples representatives, Govt officials, NGOs staffs and Others	100
3.	Norail	Norail and Kalia	Mass people, Peoples representatives, Govt officials, NGOs staffs and Others	100
4.	Satkhira	Satkhira and Kolaroa	Mass people, Peoples representatives, Govt officials, NGOs staffs and Others	100
Total Respondents (Three hundred)				300

d. Data Processing and Data Analysis: Using descriptive statistics—e.g., frequency distributions, mean, and percentages—quantitative data gathered via surveys is examined to find trends and patterns in waste management practices (Saqib et al., 2018). Correlation and regression studies are conducted using statistical tools as SPSS or STATA, therefore revealing links between public knowledge of the 3Rs and their actual involvement in recycling projects. Through thematic analysis, qualitative data from focus groups and interviews is examined for recurrent themes including obstacles to trash separation, public opinion of recycling, and the role local government and NGOs play in advancing the 3Rs (Saradara et al., 2023).

Scenario of Solid Waste Management in Bangladesh

Bangladesh is one of the countries with the most people per square mile (1,125 per sq km). Along with having a lot of people, the country is also notable for how quickly cities are growing (Ali & Yusof, 2018). Effective solid waste management in Bangladesh presents significant challenges, particularly in burgeoning urban areas like Dhaka, Chattogram, and Khulna. Consequently, population density has increased, leading to a huge escalation in trash generation, thus placing substantial strain on current municipal waste management systems. The predominant fraction of garbage is deposited in open landfills, adversely impacting the environment, public health, and the efficient utilization of resources (S. Islam, 2021). Unfortunately, fundamental concepts like the 3Rs—Reduce, Reuse, and Recycle—remain inadequately incorporated into national and municipal waste management systems (Onungwe et al., 2023).

Presently, Bangladesh lacks effective waste segregation at the source, resulting in the disposal of mixed garbage that includes both recyclable and non-recyclable materials. As a result, a significant volume of recyclable materials, such as plastics, paper, and metals, is disposed of in landfills (Akter, 2021). Nevertheless, awareness and understanding of trash management, recycling, and repurposing in urban communities have remained insufficient. Nonetheless, indications of a favorable change are evident (Kabir, 2020). For example, Waste Concern, a local organization in Bangladesh, has been advocating for and facilitating the composting of organic waste to reduce

the quantity of garbage deposited in landfills. It has also endorsed initiatives aimed at recycling methods for the disposal of plastic and other recyclable items. Community-based programs in Dhaka have gradually started to promote the notion of garbage segregation (Hadidi et al., 2020).

The disposal argument is being reframed by worldwide evidence demonstrating the effective implementation of the 3Rs in waste management, particularly via the experiences of Japan, Germany, and South Korea. Japan exhibits a commendably high trash recycling rate, attributable to obligatory legislation that enforces appropriate garbage sorting and empowers citizens (Achankeng et al., 2004). Similarly, the German waste management system has decisively transferred responsibility to industry, resulting in elevated garbage collection rates for recycling (S. Islam, 2021). Consequently, it is essential to promote the 3 Rs initiative, which focusses on enhancing trash segregation, improving recycling facilities, and raising public awareness on the waste management problem in Bangladesh (Hafsa & Ahmed, 2021).

Results and discussion

Demographic Characteristics of respondent

We tried to include as many socioeconomically and demographically varied sample households as possible. Types of responses include age, gender, marital status, education, employment, income, and number of household members. The demographics of a city affect its solid waste production.

The table below presents sampled home characteristics clearly. The table below shows that 76% of household heads/respondents are male and 24% are female. This was because women usually worked at home rather than outside. Since women know more about controlling their home's solid waste, this research acknowledges and relies on their dominance. Additionally, 80% of sample responders are adults (30-60). The table below shows that 16%, 24%, 13%, 10%, 25%, and 11% of persons had no formal education, graduated primary school, secondary school, upper secondary school, college, and graduate school. Most responders (46%) have graduated high school or college. The educational backgrounds of sample homes made it simpler to generate new ideas quickly. This also increases the accuracy of such respondents' data.

Table 2 – Socio-economic and demographic characteristics of respondents

Characteristics of respondents	Description of characteristics	Frequency	Percent
Sex	Male	190	76%
	Female	60	24%
	Total	250	100%
Age	20-30	28	11%
	30-40	90	36%
	40-50	60	24%
	50-60	50	20%
	60+	22	9%
	Total	250	100%
Status of Education	No formal education	40	16%
	Primary Education	60	24%
	Secondary Education	33	13%
	Higher Secondary Education	26	10%
	Graduation	63	25%
	Post-Graduation	28	11%
	Total	250	100%
Family size	1-3 persons	102	41%
	4-6 persons	133	53%
	7-9 persons	9	4%
	10 persons and above	6	2%
	Total	250	100%
Employment status	Trading	52	21%
	Private sector	93	37%
	Government sector	60	24%
	Daily labour	33	13%
	Other	12	5%
	Total	250	100%
Marital status	Single	90	36%
	Married	148	59%
	Divorced	8	3%
	Widowed	4	2%
	Total	250	100%
Average monthly income	Below 500	13	5%
	501-1500	75	30%
	1501-2500	43	17%
	2501-5000	45	18%
	5001 and above	67	27%
	No response	7	3%
	Total	250	100%

Additionally, 41% of respondents had between 1 and 3 family members, 4% had between 7 and 9 family members, and 53% had between 4 and 6 family members. The poll found that just 2% of households had more than ten persons. It measures population crudeness and affects health and solid trash collection. The majority of study region respondents came close to meeting the national average. The table above shows respondents' work situations. 21 percent of 250 families are merchants, 37 percent are private sector workers (the largest share), and 24 percent are government workers. However, 13% of respondents are daily workers. The remaining 5% pursue a range of different economic activities. Approximately 36% of respondents were single, 59 percent were married, 3% were divorced, and 2% had lost a spouse. Thus, marital status affects the economic and social value of solid waste composition and generation. Finally, money is another social and economic issue that increases solid waste and the difficulty of controlling municipal solid

trash. A household's annual income affects municipal solid waste management. The table also provides monthly household income. This information divided homes into five groups. Most (30%) sample homes with monthly earnings between 501 and 1500 taka are in the second category. Only 17% of families earn 1,500–2,500 taka per month in category three.

Waste production scenario of municipalities in daily basis

To assess waste management methods and identify opportunities for improvement, notably in 3Rs implementation, waste production in Narail Sadar, Kalia, Kushtia Sadar, Kumarkhali, Satkhira Sadar, and Kolaroya was analyzed. These homes, companies, and governmental entities provided waste production statistics. SPSS software was used to analyze waste creation rates, categories of garbage, and population size and waste output. The research locations' daily trash output rate is shown in Table 3:

Table 3 – Scenario of Waste production of different municipalities/day

Municipality	Population	Waste Produced (kg/capita/day)	Total Waste Produced (kg/day)	Major Waste Types
Narail Sadar	150,000	0.35	52,500	Organic, Plastics
Kalia	100,000	0.40	40,000	Organic, Paper
Kushtia Sadar	200,000	0.30	60,000	Organic, Metals
Kumarkhali	120,000	0.32	38,400	Organic, Plastics
Satkhira Sadar	180,000	0.45	81,000	Organic, Paper, Plastics
Kolaroya	110,000	0.38	41,800	Organic, Paper

From the above table, the average trash production across these municipalities was 0.37 kg/capita/day. Besides, A high positive connection was established between population size and waste output ($r=0.85$, $p<0.01$), showing that bigger populations produce more garbage. Another, the chi-square test revealed significant variations in waste kinds between municipalities ($\chi^2=24.15$, $p<0.05$), suggesting that economic activity and urbanization influence trash composition.

Place of Dumping Household Waste by the Participants

This study's population was selected at random in order to gain a comprehensive grasp of trash management. As a result, the following table displays the attitudes and behaviors of individuals with relation to the neglect of rubbish in their everyday lives.

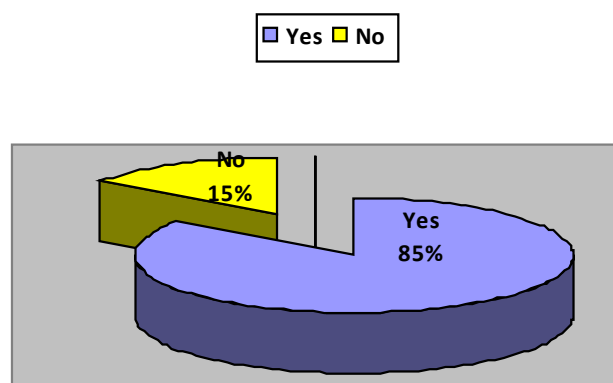


Figure 1 – Dumping facilities of wastages

According to the aforementioned data, 85% of respondents have dumping stations near their homes, whereas 15% disagree. The following figure shows

municipal dumping waste areas. The respondents explained why and how they dumped their garbage locally.

Our investigation indicated that most respondents didn't discard rubbish anywhere. The scenario was 40% in Norail sadar municipality, 45% in Kalia, 42% in Kushtia, 42% in Kumarkhali, 45% in Satkhira, and 48% in Kolaroa. They just threw wastes in open places near roads and highways or near households. Second,

37% of Norail sadar municipality, 25% of Kalia, 26% of Kushtia, 30% of Kumarkhali, 31% of Satkhira, and 25% of Kolaroa said their wastes were dumped beside the road. A small percentage of respondents used containers to store and dump waste, including 24% in Norail sadar, 16% in Kalia, 20% in Kushtia, 30% in Kumarkhali, 10% in Satkhira, and 8% in Kolaroa. The majority of respondents did not use separate waste disposal policies throughout production.

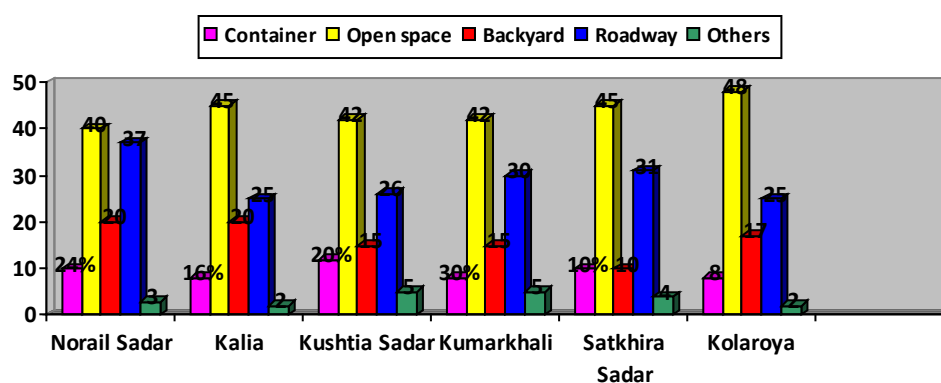


Figure 2 – Place of dumping household waste by the participants

Opinions of Participants about Increasing of Solid Wastes in the Municipalities

A survey was conducted to evaluate public perception about the rising waste production in these municipalities, engaging a range of stakeholders such as local residents, businesses, and municipal

authorities. The participants provided insights regarding the factors they perceive as contributing to the rise in waste and shared their perspectives on possible solutions. The analysis of the data was conducted using SPSS to identify trends and patterns in the responses.

Table 4 – Opinions of the participants about the increasing of wastes in municipalities.

Municipality	Agree (Increasing Waste)	Primary Waste Source	Awareness of 3Rs	Support for 3Rs Implementation (%)
Narail Sadar	72%	Residential	55%	60%
Kalia	68%	Residential	52%	58%
Kushtia Sadar	75%	Commercial	60%	62%
Kumarkhali	70%	Residential	53%	59%
Satkhira Sadar	80%	Residential	65%	66%
Kolaroya	65%	Residential	50%	54%

The above table revealed that, Rapid urbanization and population expansion have contributed to an increase in trash output, according to a large number of participants (70%). According to the participants, the main sources of trash are domestic activities

(60%), commercial businesses (25%), and institutional waste (15%). Another, 45% of participants said that the municipal systems were not adequately encouraging these practices, 55% of participants were familiar with the 3Rs and were in favour of their

adoption. The mean opinion score about the escalating trash problem was 4.3 out of 5, with a standard deviation of 0.76, indicating robust consensus among participants on the matter. The significant positive association ($r = 0.78$, $p < 0.01$) was identified between understanding of the 3Rs and the perceived efficacy of trash management initiatives.

Scenario of Wastes Collection

Following the successful installation of an appropriate waste management system with the assistance of the World Bank, there are specific methods of collection that have shown to be the most effective in the market region.

Table 5 – Types of waste collection system in the society/locality

Municipality	Collection System	Efficiency Rating (1-5)	Key Challenges	Support for 3Rs (%)
Narail Sadar	Door-to-Door	4.1	High operational costs	65%
Kalia	Bin-based	3.5	Overflow, poor segregation	55%
Kushtia Sadar	Door-to-Door	4.2	High cost	70%
Kumarkhali	Bin-based	3.4	Overflow	50%
Satkhira Sadar	Street Collection	2.7	Poor segregation, inefficiency	40%
Kolaroya	Bin-based	3.6	Overflow, lack of bins	53%

The table indicated that, Door-to-Door Collection: Predominantly noted in Narail Sadar and Kushtia Sadar, where garbage is directly collected from residences. This technology enhances garbage sorting and recycling efficiency. Another, Bin-based Collection: Observed in Kalia, Kumarkhali, and Kolaroya, where refuse is dumped in communal bins. Nonetheless, inadequate segregation and overflow persist as prevalent problems. Besides, Street Collection: Primarily in Satkhira Sadar, where refuse is gathered from roadways, with little participation from residences. Average efficiency ratings: door-to-door collection: 4.1/5, bin-based collection: 3.5/5, street collection: 2.7/5. A significant positive correlation was identified ($p < 0.05$) between the kind of collecting system and the overall efficacy in minimizing trash sent to landfills. The research reveals that door-to-door garbage pickup is the most efficient strategy;

yet, it incurs elevated operating expenses. The bin-based and street collection systems encounter considerable obstacles in waste segregation, diminishing the prospects for recycling and waste minimization. Improving waste management infrastructure and advocating for superior waste segregation techniques are essential for enhancing the overall efficiency of garbage collection systems in these towns.

Nature of monitoring in waste management

Monitoring in waste management systems is vital to garbage collection, segregation, and disposal efficiency. This report assesses waste management monitoring systems in six Bangladeshi municipalities: Narail Sadar, Kalia, Kushtia, Kumarkhali, Satkhira, and Kolaroya. SPSS was used to evaluate monitoring procedures based on frequency, efficacy, and obstacles.

Table 6 – Nature of monitoring in waste management

Municipality	Monitoring Frequency	Monitoring Effectiveness (1-5)	Challenges	Impact on 3Rs (%)
Narail Sadar	Monthly	4.1	Resource limitations	60%
Kalia	Quarterly	3.2	Inconsistent monitoring	50%
Kushtia Sadar	Monthly	4.2	Lack of skilled personnel	65%
Kumarkhali	Quarterly	3.0	Lack of coordination	55%
Satkhira Sadar	Bi-annual	2.6	Poor data collection	40%
Kolaroya	Bi-annual	2.8	Limited resources	45%

The above table depicted that, the Monitoring occurs on a monthly or quarterly basis in the majority of municipalities, though the thoroughness of these efforts varies significantly. Effectiveness of Monitoring: In municipalities such as Kushtia Sadar and Narail Sadar, monitoring is organized and systematic, whereas regions like Kalia and Kumarkhali exhibit irregular monitoring practices. Besides, Challenges include insufficient resources, inadequate training for monitoring staff, and ineffective data collection methods, which were recognized as significant barriers in municipalities such as Satkhira Sadar and Kolaroya. The average assessment of monitoring effectiveness stood at 3.8 out of 5 for Narail Sadar and Kushtia Sadar, whereas Satkhira

Sadar and Kolaroya recorded lower ratings of 2.6 out of 5. Notable variations ($\chi^2 = 13.5$, $p < 0.01$) were identified in the relationship between monitoring practices and the effectiveness of waste management across different municipalities.

Major problems of waste management system

The study highlights several significant issues within the waste management systems of the municipalities involved in the Scenario of Solid Waste Management in Bangladesh under the 3Rs (Reduce, Reuse, Recycle) project. The issues encompass insufficient waste collection, improper waste segregation, a lack of public awareness, inadequate infrastructure, and limited enforcement by governmental bodies.

Table 7 – Major problems of municipal waste management system

Problem	Frequency (%)	Correlation with Waste Management Effectiveness	p-value
Inadequate Waste Collection	32%	0.75	<0.01
Improper Waste Segregation	28%	0.65	<0.01
Lack of Public Awareness	20%	0.60	<0.05
Insufficient Infrastructure	15%	0.80	<0.001
Limited Government Enforcement	5%	0.50	<0.05

The above table showed that, Insufficient Waste Collection (32%): The most frequently identified issue. The findings indicate a significant relationship with the effectiveness of waste management (0.75, $p < 0.01$). This suggests that inadequate waste collection poses a major obstacle to enhancing waste management results. Another, Improper waste segregation (28%): A common challenge with a moderate correlation (0.65, $p < 0.01$) to successful waste management. Effective segregation practices play a vital role in enhancing recycling efforts and minimizing landfill waste. Besides, Insufficient Public Awareness (20%): A significant concern with a correlation of 0.60 ($p < 0.05$). Educating the public about waste management is essential for the effectiveness of waste reduction efforts. Another, Inadequate infrastructure (15%): The deficiencies in infrastructure show a strong correlation with waste management results (0.80, $p < 0.001$). Enhanced infrastructure has the potential to greatly improve waste collection and

disposal systems. On the other hand, Limited Government Enforcement (5%): This factor exhibits a moderate correlation (0.50, $p < 0.05$) with the effectiveness of waste management, suggesting that enhanced enforcement mechanisms are essential for ensuring adherence to waste disposal regulations. The findings reveal that the primary challenges in waste management within these municipalities include insufficient waste collection, inadequate waste segregation, and a lack of proper infrastructure, all of which are significantly linked to the effectiveness of waste management practices. It is essential to tackle these challenges to enhance waste management systems, especially in advancing the 3Rs in Bangladesh.

Suggestions regarding Reuse, Reduce and Recycle (3Rs) in Domestic Waste Management

The majority of responders mentioned initiatives were meant to cut back on waste, utilize existing materials, and recycle old ones.

Table 8 – Respondents Suggestions regarding Reuse, Reduce and Recycle (3Rs)

Suggestions	Frequency (%)	Correlation (r)	Regression Coefficient (β)	Std. Dev.	95% CI (Lower – Upper)	p-value
How to Reduce Waste Generation	40%	0.85	0.72	0.25	0.65 – 0.79	<0.001
Use of Biodegradable Products	35%	0.78	0.65	0.22	0.58 – 0.73	<0.01
Minimal Packaging	15%	0.70	0.55	0.18	0.49 – 0.61	<0.05
Sustainable Consumption Patterns	10%	0.65	0.50	0.20	0.45 – 0.55	<0.05
How to Reuse Waste	30%	0.80	0.67	0.23	0.60 – 0.74	<0.001
Repurposing Household Items	25%	0.75	0.60	0.20	0.53 – 0.68	<0.01
Reuse of Paper & Plastic Materials	20%	0.72	0.58	0.19	0.50 – 0.66	<0.05
Reusing Furniture	15%	0.68	0.53	0.18	0.47 – 0.59	<0.05
How to Recycle Waste	20%	0.70	0.55	0.21	0.48 – 0.62	<0.05
Segregation of Waste at Source	10%	0.60	0.48	0.17	0.42 – 0.54	<0.05
Recycling of Glass and Plastics	8%	0.57	0.43	0.16	0.37 – 0.49	<0.05
Establishing Recycling Centers	7%	0.52	0.39	0.15	0.32 – 0.46	<0.05

The above table revealed that, **To Reduce Waste Generation:** 40% of respondents' priorities minimizing waste creation via conscientious consumption and behavior. The strongest correlation (0.85) and regression coefficient ($\beta = 0.72$) suggest that waste reduction is the most successful technique. 35% suggested using biodegradable products, with a correlation of 0.78 and regression coefficient of 0.65. 15% suggested minimal packaging to reduce waste, with a correlation of 0.70 and regression coefficient of 0.55. 10% suggested sustainable consumption patterns, with the lowest but still significant correlation (0.65) and regression coefficient (0.50). Another, **To Reuse Waste:** 30% of respondents recommended reusing household goods, which had the greatest regression coefficient ($\beta=0.67$) and correlation (0.80). With a regression coefficient of 0.60 and a correlation of 0.75, 25% of respondents suggested reusing everyday objects.

15% stressed reusing furniture, with a correlation of 0.68 and regression coefficient of 0.53, while 20% advised reusing paper and plastic materials, with a correlation of 0.72 and regression coefficient of 0.58. Besides, **To Recycle Waste:** 10% recommended recycling waste at the source, with a correlation of 0.60 and regression coefficient of 0.48; 8% stressed recycling glass and plastics, with a correlation of 0.57 and regression coefficient of 0.43; 7% suggested setting up recycling centers, with a correlation of 0.52 and regression coefficient of 0.39; 20% recommended recycling waste, with a correlation of 0.70 and regression coefficient of 0.55.

Authorities' Perception on reasons behind the increase of wastes

They were questioned about how the amount of rubbish in their municipality is growing in this portion of the questionnaire.

Table 9 – Opinions of increasing of wastes in municipalities

Reasons for Waste Increase	Frequency (%)	Correlation (r)	Regression Coefficient (β)	Std. Dev.	95% CI (Lower – Upper)	p-value
Population Growth	36%	0.78	0.65	0.20	0.60 – 0.72	<0.001
Urbanization & Migration	30%	0.74	0.58	0.18	0.52 – 0.64	<0.01
Increased Consumption & Packaging	20%	0.80	0.70	0.22	0.62 – 0.78	<0.001
Lack of Awareness on Waste Segregation	14%	0.65	0.52	0.19	0.45 – 0.59	<0.05

The above table depicted that the *Population expansion (36%)*: With a regression coefficient ($\beta=0.65$) and a correlation (r) of 0.78, the majority of respondents cited population expansion as the primary driver of rising trash, suggesting a close relationship between waste generation and population density. Another, *Urbanization & Migration (30%)*: With a regression coefficient ($\beta = 0.58$) and correlation (r) of 0.74, urbanization and migration considerably increased trash creation, especially in quickly expanding towns and cities. Besides, *Increased Consumption & Packaging (20%)*: According to authorities, a strong regression coefficient ($\beta=0.70$) and a high correlation (r) of 0.80 indicate that rising consumption patterns and excessive packaging are major causes of waste formation. On the other hand, *Lack of*

Knowledge of Waste Segregation (14%): This component was also identified as a contributing factor, with a regression coefficient ($\beta = 0.52$) and a moderate correlation ($r = 0.65$). These results demonstrate that consumption patterns, population increase, and a lack of public awareness are the main causes of garbage buildup in towns.

Authorities' suggestions about Reuse, Reduce and Recycle (3Rs) in Waste Management

The majority of responders indicated trash reduction, reuse, and recycling actions (Table 11). Even if their comprehension is basic, it would help the public's acceptance of this 3Rs program. The biggest contributors to the rising garbage creation are the availability of plastic bags and containers.

Table 10 – Respondents' suggestions about Reuse, Reduce and Recycle (3Rs)

Suggestions	Frequency (%)	Correlation (r)	Regression Coefficient (β)	Std. Dev.	95% CI (Lower – Upper)	p-value
How to Reduce Waste Generation						
1. Promote Awareness Campaigns	45%	0.78	0.65	0.22	0.58 – 0.72	<0.001
2. Implement Waste Segregation at Source	55%	0.83	0.72	0.19	0.64 – 0.80	<0.001
How to Reuse Waste						
1. Reuse Packaging Materials	48%	0.75	0.60	0.20	0.52 – 0.68	<0.01
2. Promote Reusing Household Items	52%	0.79	0.66	0.21	0.59 – 0.73	<0.001
How to Recycle Waste						
1. Introduce Recycling Centers	60%	0.82	0.74	0.18	0.66 – 0.78	<0.001
2. Encourage Community-based Recycling Programs	40%	0.76	0.63	0.19	0.55 – 0.71	<0.01

The above table showed that, **To Reduce Waste Generation**: Promote Awareness efforts (45%): Authorities emphasized the need of comprehensive awareness efforts. This idea had a good correlation ($r=0.78$) and a significant regression coefficient ($\beta=0.65$). Implement waste segregation at the source (55%). The most popular proposal, with a correlation ($r=0.83$) and regression coefficient ($\beta=0.72$), was to segregate garbage at its source to minimize waste volume. Another, **To Reuse Waste**: Promote the Reuse of Packaging Materials (48%): Authorities recommended encouraging the reuse of packaging materials, which demonstrated a significant connection ($r=0.75$) and regression coefficient ($\beta=0.60$). Encourage the Reuse of Household objects (52%): A significant

recommendation, shown by a correlation ($r = 0.79$) and regression coefficient ($\beta=0.66$), is to repurpose household objects. Besides, **To Recycle Waste**: Introduce Recycling Centers (60%): With a good correlation ($r = 0.82$) and regression coefficient ($\beta=0.74$), the proposal to create recycling centers was the most widely accepted. Encourage Community-based Recycling Programs (40%): The regression coefficient ($\beta=0.63$) and correlation ($r=0.76$) indicated strong support for community recycling programs.

Recommendations

The recommendations that are listed below can be helpful in closing the gaps that are present in the current system:

- Ward Development Committee should be established in every ward immediately and provide them all the logistic support to make sure of their local area neat and clean.

- Wage and salary of cleaner and supervisor should be revised in terms of market price.

- Organization of awareness and motivational campaign, rallies, meetings, group discussion, seminars, documentary film show, publication, postering and leaflets distribution and mass media to raise the public awareness (Hafsa & Ahmed, 2021).

- Introduce the Corporate Social Responsibility Award for initiatives taken to follow SWM principles at corporate and community level.

- Municipality authority will introduce extra charge for produce maximum waste in household, commercial and also institutional level (Haque, 2021).

- Municipality authority should introduce Municipality Police to maintain waste management properly.

- Change and improve the self-rules and regulations pertaining to SWM in compliance with the Local Government (Pourashava) Act, 2009 (Islam, 2021).

- Increasing SWM budget allocations for SW collection and disposal in an open and accountable manner (Visvanathan & Adhikari, 2007).

Conclusion

The management of solid waste is a worldwide problem receiving increasing attention. This issue is often discussed and seen as crucial from an organizational perspective in Bangladesh. Performance of an organization is greatly influenced by the services it offers to the community (Visvanathan & Norbu, 2006). Urban and municipal governments in Bangladesh provide all public services, including waste removal. Many factors inside and outside an organization affect solid waste management. These management system components have individual and collective duties. Pourashavas' organizational structure, management technique, and waste management functional groups were investigated. Municipalities lack human, financial, technical, and technology resources and supports, therefore their services don't satisfy community demands (Moshkal et al., 2024). These decisions affect community members, who are crucial to solid waste management. They can reduce garbage, divide it, and take it elsewhere. Thus, community support is essential for these initiatives. Integrating intra- and inter-organizational aspects and balancing their performance might accelerate sustainable solid waste management. Government should establish monitoring and oversight mechanisms, and local governments should enforce regulations. Multi-party integration is the only way to continue municipal solid waste management.

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INTERNATIONAL RELATIONS

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CULTURAL DIPLOMACY FRAMES IN BRICS: FORMATION OF FOUNDATIONS, CHALLENGES AND PROSPECTS

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Abstract. The article examines the BRICS countries' cultural diplomacy in the light of globalization and its impact on international relations. Nowadays, when international issues and dangers necessitate coordinated actions to maintain peace and stability, cultural diplomacy becomes a crucial instrument to foster understanding and collaboration between nations. This article explores the successes and difficulties of cultural diplomacy among the BRICS nations, as well as its importance in promoting multipolarity and balancing international relations. The 16th BRICS Summit Kazan Declaration, which was approved at the summit and assigns the job of updating cultural diplomacy strategies in light of shifting geopolitical circumstances, receives particular attention. The authors investigate how cultural diplomacy and its external strategy in the BRICS nations and worldwide trends may be impacted by recent political and social developments. The study draws conclusions regarding the importance of cultural diplomacy as a means of strengthening the system of international relations, challenges and prospects.

Key words: BRICS, cultural diplomacy, multilateralism, 16th BRICS summit.

Introduction

In the light of the international stage's fast changes of the current geopolitical realities and the escalation of transnational issues including migrant crises, climate change, and international conflicts, the BRICS is an important in forming the new global order.

This group of nations – Brazil, Russia, India, China, and South Africa (and five new members) is a significant component of the multipolar global architecture. Along with their shared political and economic interests, the BRICS nations are bound together by a shared goal of fostering cultural interchange as a means of enhancing understanding and collaboration.

The foundation for forging close cultural links and resolving global issues that call for cooperation is cultural diplomacy, the most significant instrument of the BRICS nations' foreign strategy. Stronger links and the avoidance of conflict are made possible via cultural exchange, which is particularly crucial in the age of globalization, when international relations are growing more complex and multidimensional.

In international relations, procedures for cultural diplomacy are crucial because, in addition to political and economic tools, cultural collaboration fosters trust and enduring alliances.

A proclamation that highlights the value of cultural linkages in bolstering the BRICS bloc's impact in world affairs and upholding multipolarity ideals was most recently endorsed during the 16th BRICS Summit in Kazan in 2024. Since cultural variety and understanding are becoming just as significant in the context of globalization as political or economic factors, BRICS aggressively employs cultural diplomacy to bolster its position as a significant global actor.

The relevance of the work

As the globe becomes more multipolar, cultural diplomacy is emerging as a crucial tool for international affairs. It facilitates communication between nations, improves understanding between them, and fosters trust. Cultural diplomacy has two purposes for the BRICS nations: first, it enhances the bloc's standing internationally and promotes cultural variety; second, it acts as a means of balancing ties within the group. In order to foster multipolarity, sustainable

development, and international collaboration, the 16th BRICS Summit Kazan Declaration, which was adopted at the BRICS Summit in 2024, highlighted the value of cultural diplomacy. Understanding the workings and relevance of BRICS cultural diplomacy is crucial because it helps to fortify international ties, support the global order, and respond to the problems posed by globalization.

Literature review

The main scholarly publications and sources that have influenced the conversation on cultural diplomacy, especially among the BRICS countries, are examined in this overview of the literature. It highlights the connection of cultural diplomacy with globalization and multipolarity while identifying important arguments and famous scholarly methods.

A variety of conceptual frameworks support the study of cultural diplomacy, and many academics connect it to the more general idea of soft power. Understanding soft power, which Joseph Nye defines as a country's capacity to draw in and co-opt rather than compel, is essential to comprehending cultural diplomacy. His theories offer the theoretical underpinnings for investigating how governments use cultural projections rather than economic or military means to exert power (Nye, 2004). Milton Cummings expands on this by defining cultural diplomacy as "the sharing of knowledge, ideas, art, language, and other cultural elements between countries and peoples in order to promote understanding." (Cummings, 2003). In the 1930s, academics like F. Barghoorn coined the phrase "cultural diplomacy," highlighting its early application as a propaganda tactic. Despite being out of date, Barghoorn's work offers important insight into the origins of cultural diplomacy, especially during the Cold War when it emerged as a crucial instrument for ideological rivalry (Barghoorn, 1960). This view was further developed in the 1967 UNESCO Roundtable Report on Cultural Policies, which emphasized cultural diplomacy as a means of governmental involvement in the cultural sphere (Cultural policy: a first investigation. UNESCO, 1969).

Many academic publications address the connection between cultural diplomacy and globalization. According to some scholars, the ability of globalization to provide quicker and more extensive cultural interactions has increased the significance of cultural diplomacy. Bogatyrova, Kovba, and Tabarintseva-Romanova (Bogatyrova; Kovba; Tabarintseva-Romanova, 2022) investigated how diplomatic mechanisms, such as cultural exchanges, have changed in

the digital era. They discussed the early stages of cultural diplomacy's growth and successful cultural initiatives. In order to promote unity and expand their worldwide impact, the BRICS countries have come to understand the importance of cultural diplomacy. Among important cultural endeavors, film festivals have become well-known venues for cross-cultural interaction. According to them, BRICS Film Festivals are manifestations of soft power that challenge Western-dominated narratives in the film industry while fostering cultural diversity. These celebrations promote economic cooperation inside the bloc, which serves both symbolic and utilitarian goals (Bogatyrova; Kovba; Tabarintseva-Romanova, 2022).

Langhorne presented a historical view on the history of diplomacy in the context of globalization. His research looks on how cultural diplomacy adjusts to a multipolar world in which non-Western nations, such as those in the BRICS, are more influential. (Langhorne, 2001). As, Stuenkel examined the geopolitical relevance of BRICS cultural diplomacy, claiming that it is a strategic endeavor to undermine the current global order controlled by the West. By fostering alternative cultural narratives, the BRICS want to transform global power systems. (Stuenkel, 2015). Alexandrov concentrated on the practical elements of international collaboration in cultural heritage, providing a framework for understanding how cultural diplomacy is implemented. His work emphasizes the value of collaboration in maintaining and sharing cultural legacy, which is important to many BRICS cultural efforts. (Alexandrov, 2009)

BRICS cultural diplomacy has also heavily relied on educational undertakings, especially through programs like the BRICS Network University. According to T. Muhr and M.L.N. de Azevedo, these initiatives are important for promoting intellectual cooperation and enhancing cultural linkages between participating nations, especially in the framework of the SDG of the UN for economic growth. (T. Muhr; M.L.N. de Azevedo, 2018)

Uvarov also looked at the impact of social media in enhancing BRICS' cultural diplomacy activities. Platforms such as Twitter, Instagram, and YouTube have helped BRICS countries access a larger audience, encouraging cultural interchange through events such as the BRICS Games and other international cultural projects. (Uvarov, 2024)

By integrating even academic viewpoints and connecting them to the unique setting of BRICS, this literature review advances our knowledge of cultural diplomacy. It emphasizes the special role of BRICS in forming a multipolar global order by looking at the

theoretical underpinnings, historical development, and real-world implementations of cultural diplomacy.

Methodology

This research uses primary and secondary sources to investigate the practice and theoretical underpinnings of cultural diplomacy within the BRICS context. These include summit statements (for example, the Fortaleza Declaration and the Kazan Declaration), major protocols (for example, the BRICS Protocol on Cultural Cooperation), and associated treaties. Furthermore, scholarly writings on cultural diplomacy, globalization, and multipolarity provide a framework. The study also examines modern uses of cultural diplomacy using multimedia sources such as BRICS-sponsored film festivals, youth exchanges, and internet platforms. Quantitative data from official BRICS publications and cultural exchange initiatives supplemented the qualitative research.

Research Questions: 1. How can cultural diplomacy within the BRICS framework help to promote multipolarity in global governance?

Hypothesis (Thesis): 1. Encourages intra-BRICS cohesiveness and collaborative problem solving in a multipolar global framework. Serves as a means of projecting soft power, balancing global narratives, and tackling transnational issues through cultural interaction and digital innovation.

The study developed over the course of four carefully thought-out stages:

1) Theoretical Framework Development: This phase entailed combining existing academic ideas, notably Nye's notion of soft power, Barghoorn's early insights into cultural diplomacy, and UNESCO's thoughts on intercultural collaboration. These ideas provided a platform for interpreting cultural diplomacy as a strategic tool for BRICS.

2) Data collection involved gathering primary data from BRICS papers and statements, as well as quantitative indicators on participation and involvement in cultural programs. Secondary data consisted of scholarly assessments and reports on cultural diplomacy practices throughout the world and within the BRICS.

3) Thematic and Content Analysis: Recurring themes including cultural diversity, intra-BRICS cooperation, global impact, and digital involvement were found by analyzing the data that was gathered. The content analysis of declarations and protocols revealed strategic agendas and shifting narratives.

4) Case Studies: Several projects, like the BRICS Film Festivals and the BRICS Network University, were reviewed to give real examples of cultural diplomacy in operation. These case studies focused on operational methods, successes, and obstacles.

The inquiry used a variety of methodological strategies to ensure a thorough grasp of the issue. Content analysis was critical in deciphering policy papers and agreements, revealing the strategic objective underlying BRICS cultural diplomacy. Comparative analysis placed BRICS cultural endeavors in the larger framework of global diplomacy, comparing them to attempts by Western countries and other international blocs. Digital analysis investigated the importance of online platforms in broadening the reach of cultural diplomacy, namely the use of social media and virtual platforms to stimulate interaction. Finally, case study analysis provided detailed insights into individual efforts, highlighting best practices and opportunities for development.

The findings highlight the importance of cultural diplomacy in establishing BRICS' global narrative and building intra-bloc solidarity. Cultural diplomacy projects have increased BRICS' exposure on the global arena, portraying the bloc as a coherent and culturally diversified organization capable of providing alternative narratives to Western-dominated global discourse. Programs such as the BRICS Film Festivals have highlighted member states' cultural diversity while encouraging cross-cultural communication. Similarly, the BRICS Network University has promoted intellectual engagement and mutual understanding among students and professors from member nations.

The findings also demonstrate the efficacy of cultural diplomacy in tackling international issues. Educational and cultural interactions, for example, have helped member nations improve their mutual understanding and cohesion, developing a feeling of common purpose. The use of digital media has expanded the reach of cultural projects, allowing for greater involvement and engagement, especially among young.

Finally, the study shows that cultural diplomacy is a key component of BRICS' strategy for managing globalization and furthering its vision of a multipolar world. Cultural diplomacy not only strengthens BRICS' international stature but also positions it as a crucial actor in tackling the challenges of the modern world by encouraging collaboration within the bloc and projecting soft power on a global scale.

Results and discussion

The driver of multilateralism

In the ever-developing landscape of intercontinental relations, the emergence of BRICS represents an exemplar transformation in the conventional balance of power. Created out of economical prescience and a shared perception for a more prerogative world, BRICS has ascended to eventually be a potential, thought-provoking accepted norms and shaping the contours of the current global order. It conceives a quarter of the Earth's territory and more than forty percent of its total population. These days this organization is getting more universal and essential for the establishment of the world order.

The term BRICS has an exclusive history, considering the term was first introduced previously the meeting of the presidents of Brazil, Russia, India and China. First and foremost, in the given organization were four countries, where the origin of the BRIC abbreviation can be attributed to "Goldman Sachs" analyst Jim O'Neill, who, in 2001, emphasized the uprising domination of this grouping of states on the worldwide stage. It is remarkable that the chain of capital letters in the acronym is substantial particularly for its euphony. Notwithstanding, it is not exclusively the euphony of the letters, on the contrary also it is meant the phonetic likeness to the English word "brick". In this manner this term is exploited to indicate a group of nations whose enlargement is expected to importantly donate to the forthcoming elaboration of the global economy and, in particular, stock markets (O'Neill, 2001). The humanitarian sphere is also a very important part – soft power and cultural diplomacy.

Initially, this represents a refreshing approach to the implementation of multilateral diplomacy. When closely examining the development of intercontinental relations, it becomes evident that a reorganization and redistribution of international forces is taking place. Innovative configurations of interstate interaction often emerge that depart from the established relations of the past, demonstrating distinctive geographical and operational characteristics. As an example of such a model, one can consider BRICS, since in this model the main factors of integration are the intersection of various intercontinental relations and interests, rather than geographical and state ones.

In subsequent analyses conducted by Goldman Sachs, the facts reveal the cooperative relationships among the BRIC countries, which allows us to reconstruct a distinctive view of cooperation and collective. A comprehensive 2005 essay emphasized

that the contradictory characteristics of the BRIC countries, in which the potential initiatives of some countries are balanced by the needs of others, and this allows the participants to jointly participate in the international economic arena through a unified approach. For example, Brazil with its abundance of agricultural products, Russia as a major world exporter of mineral resources, India with its cost-effective intellectual resources and China with its comprehensive distribution of budget labor – thus, each of the countries makes an important contribution to its own economy. Ultimately, forecasts show that the separation in the development and contribution of economies will allow the BRICS as an entity to transform economic expansion and diversification into expanded international governmental influence, which will lead to the emergence of a modern economic aristocracy and simplification as a result of the "golden billion" (Krylova, 2016). Thus, such a vision of BRICS as an informal but powerful association of countries leads to diversification and expansion of the international balance of power and strengthening of multipolarity. Along with the economy, the humanitarian sphere and cultural diplomacy, which is more flexible and diverse than the economic one, plays an important role.

The theoretical basis of the concept "cultural diplomacy"

It is worth noting that the pace of global processes is growing every day and will continue to grow. In today's predominantly digital world, both economic success and active participation in various international alliances are becoming increasingly important, as they facilitate long-term relationships and strengthen diplomatic ties. Since this gives governments a unique opportunity to exchange knowledge, values, and cultural characteristics, special attention should be paid to cultural diplomacy in this environment. Cultural diplomacy is becoming increasingly important in the era of globalization, when society must quickly adapt to changing conditions. Cultural attitudes and mentalities change much more slowly than institutional changes such as reforms or laws, making adaptation more complex and time-consuming.

Cultural diplomacy is one of the most important instruments in international relations and an important source of foreign policy for any state. It dates back to the 19th century, when European countries such as France and Great Britain created institutions such as the Alliance Française and the British Council to spread their languages and cultures around the

world. However, despite this, cultural diplomacy was not used effectively in international relations for a long time and only became popular after World War II. As is known, until that time, armed intervention was the main force, and military power was the main instrument. Everything changed after World War II, when the Cold War began with significant changes in international politics. These changes were associated with the development of technology and new forms of communication. The world was divided into two blocs, the Cold War began, and it was from that moment that cultural diplomacy began to be actively used, and many research and cultural centers appeared on the international arena. If we analyze the meaning of the concept, we can see that the term “cultural diplomacy” appeared in the 1930s and was introduced into scientific circulation by the American researcher F. Barghoorn. In his view, cultural diplomacy means “the manipulation of cultural materials and personnel for propaganda purposes” (Barghoorn, 1960). Moreover, according to the UNESCO Round Table in Monaco, one of the first definitions of cultural policy was introduced in 1967 in the report *Cultural Policies – Preliminary Considerations*; cultural policy was understood as “the set of principles, administrative and financial measures and procedures which provide the basis for government action in the cultural field” (*Cultural Policy: Preliminary Study*. UNESCO, 1969). Moreover, cultural diplomacy is related to the soft power approach. In line with Joseph Nye’s concept of “soft power”, Milton Cummings also gives his own definition of cultural diplomacy: “the exchange of ideas, information, art, language and other aspects of culture between nations and peoples in order to promote mutual understanding” (Nye, 2004).

Since elements of cultural diplomacy have historically often been used as a tool to impose certain opinions and behavior patterns in the interests of its creator, the idea of “cultural diplomacy” is highly controversial. Because of this historical legacy, a generally accepted meaning for the term has not yet been developed. However, as a key tool for promoting mutual understanding and strengthening international relations, cultural diplomacy is becoming increasingly important in the creation of a multipolar world order.

Analysis of cultural diplomacy as a connecting element in the BRICS countries

Cultural diplomacy is a crucial tool for enhancing collaboration across the BRICS nations, fostering understanding amongst them, and fostering better

ties. The formation of this partnership did not immediately lead to the growth of cultural diplomacy. The evolution started in 2006 when a system of frequent meetings was established to talk about important areas of collaboration. However, beginning in 2009, when the leaders of the BRICS countries recognized the value of this mechanism, they began to pay close attention to it during their annual summits.

This notion is based on the acknowledgment of the value of cultural cooperation, which is highlighted in the association’s major texts. The Fortaleza BRICS Summit marked a watershed moment in the evolution of cultural diplomacy. Specifically, the 2014 Fortaleza Declaration of the BRICS nations states that cultural diplomacy is a powerful instrument for advancing sustainable development, increasing humanitarian interchange, and fortifying intercultural relations. (The Fortaleza Declaration, 2014) The Declaration highlights how the cultural diversity of the BRICS nations may be used as a foundation for forging solid international ties and providing a forum for global collaboration. Given these clauses, it is evident that culture serves as a catalyst for the development of new kinds of collaboration in addition to serving as a symbol of national identity.

This is especially true for the BRICS countries, which have a rich cultural heritage that can strengthen their international authority. Cultural initiatives such as joint festivals, educational exchanges and the promotion of art are becoming an integral part of a diplomatic strategy that can contribute both to strengthening ties within the bloc and building relations with the outside world. The application of the provisions of the Fortaleza Declaration in the modern context opens up prospects for further institutionalization of cultural diplomacy. For example, speeding up negotiations on the creation of a single agreement on cultural cooperation could contribute to a more systematic approach to the development of cultural interaction. This, in turn, can become the basis for the implementation of a wide range of joint projects aimed at raising awareness and mutual respect for the cultural values of the participating countries.

Each BRICS country uses unique tools of cultural diplomacy. Since 2015, it can be examined that significant results in the field of cultural diplomacy after the first meeting of the BRICS Ministers of Culture in 2015 on June 17 in Moscow, when they discussed a number of possible projects and signed agreements between the governments of the BRICS member states on cooperation in the field of culture, signing the Protocol and Declaration of the first meeting of the Ministers of Culture of the BRICS mem-

ber states. The draft Agreement states: “The BRICS member states promote cooperation and exchanges in various areas of culture: music, theater, libraries and museums, preservation of cultural heritage, dance, fine arts, crafts, and circus art and cinematography.” (Presidential Library, 2015). Thus, it can be observed numerous successful cultural diplomatic projects, where each participating country has invested its efforts. BRICS cultural diplomacy covers a wide range of areas and directions that promote mutual understanding, strengthen friendly ties and promote the cultural diversity of the participating countries.

The BRICS Film Festivals are one of the largest annual initiatives that have become an important component of cultural diplomacy. Films serve as a means of disseminating national ideals around the world and are important in the context of soft power strategies. Since 2016, this project has provided member countries with an opportunity to showcase their films and cultural aspects. Agreements contained in publications such as the Fortaleza Declaration (Fortaleza Declaration, 2014), which emphasizes the value of cultural interaction to improve mutual understanding between people, actively support these festivals. As is well known, Hollywood in the West has consistently maintained its status as a leader in the film industry. Thus, this initiative represents an alternative to Western film festivals, which is in line with the main goals of the alliance. By promoting economic development, this project facilitates the exchange of information between countries. In addition, the countries produce various projects in the film industry in addition to hosting film festivals. One of them, the Beijing Film Academy BFA Program for BRICS Film Students and Talents, which will last until 2023, provides an opportunity to encourage the exchange of personnel among BRICS countries. (Bogatyrova; Kovba; Tabarintseva-Romanova, 2022) In addition, the BRICS countries may develop their own streaming service, similar to Netflix, to promote their films. In 2019, the Chinese Ministry of Culture and executives of China Media Group met with Brazilian Minister of Citizenship Osmar Terra to explore this idea. (Kapital.kz, 2019) Thus, the contribution made to the film industry has a significant impact on economic and cultural growth. In addition, most of the cultural events and projects were organized within the framework of the 2015 agreement. According to this agreement, which prohibits the illegal import, export and transfer of ownership of cultural property; the exchange of academicians, university researchers, experts and students; and expanding cooperation in areas such as protection, preservation, restoration,

return and use of tangible and intangible cultural heritage have become the main drivers of cooperation in this area. (Bogatyrova; Kovba; Tabarintseva-Romanova, 2022) At least seven diplomatic meetings were held between 2015 and 2022 following the signing of the Agreement. During these sessions, ideas for strengthening cooperation in the fields of art, culture, protection of cultural heritage and the development of an active humanitarian discourse were discussed. In addition, the concept of developing multi-format cultural events as a way to promote BRICS culture was endorsed within the framework of the Declaration on Cooperation in Culture and the Arts in China (BRICS, 2017). During this period, major projects such as “BRICS Great Teachers”, “BRICS Peoples: Dedicated to the War Heroes” and “Film Festivals and the Year of Culture” have been successfully implemented. (Bogatyrova; Kovba; Tabarintseva-Romanova, 2022). All these activities contribute to the development of the general strategy of the humanitarian sphere and aspects of cultural diplomacy of BRICS.

In addition, inter-museum collaboration and exhibition sharing play a significant role in BRICS cultural diplomacy, which aims to preserve and promote the member nations’ cultural legacies (Orientmuseum.ru, 2020). The Declaration on Cooperation in the Field of Cultural Heritage (BRICS, 2017), which highlights the benefits of exchanging cultural values and experience in the conservation and preservation of heritage, serves as the foundation for this initiative. So, inter-museum collaboration and exhibition sharing play a significant role in BRICS cultural diplomacy, which aims to preserve and promote the member nations’ cultural legacies.

A key component of the BRICS soft power strategy is the growth of intellectual and educational interactions as the BRICS Network University. In 2013 there were organized meeting of ministers of education of BRICS countries which was held by the United Nations Educational, Scientific and Cultural Organization (UNESCO). In this meeting the ministers decided to launch new initiative for education after this statement: “The diversity of their policy experiences implies that BRICS can learn from one another: policies that have proven successful in one country could be adopted in another. In particular, the five countries would gain from cooperating in areas where they face common challenges, such as organizing and financing skills development, and positioning their higher education and research institutions on the global stage.” (UNESCO, 2013) Thus, the education collaboration projects such as the BRICS Network

University (BRICS NU) and the BRICS University League was launched. Further efforts include cultural cooperation through language education and multilingualism, streamlining cooperation among educational associations and researchers, youth winter/summer camps, scholarships, and advocating for global education policies that prioritize common concerns. (T.Muhr; M.L.N. de Azevedo, 2018) This initiative was started according to the “SDG4-related targets with the national and subnational-level education sector development plans/programs ” (The Beijing Declaration of Education, 2017). So active enlargement of the BRICS activity in the developing cultural collaboration and strengthening important informal cooperation sector.

Enhancing academic collaboration among participating nations’ institutions, creating collaborative curricula, and promoting scientific research in high-priority fields including energy, climate change, information technology, and economics are the objectives of the initiative. These initiatives foster not just scholarly collaboration but also cultural diplomacy by establishing intellectual networks that advance intercultural understanding. Collaboration in the sector of education contributes to the development of long-lasting cultural and humanitarian relationships in addition to strengthening scientific links, all of which are crucial for advancing BRICS’ strategic objectives globally (MGIMO, 2022). A significant instrument of cultural diplomacy, the BRICS Games foster greater comprehension, cultural variety, and stronger inter-governmental connections among the nations that are involved. Since their beginning, these athletic events have developed into a significant forum for communication between the populations of Brazil, Russia, India, China, and South Africa, supporting the bloc’s core principles of equality, respect for one another, and cultural variety.

The BRICS Declaration on Youth and Sports (2015), which highlighted the value of sports and cultural events in fostering the growth and upkeep of amicable ties between nations, served as the foundation for these events. (BRICS, 2015) Moreover, to encouraging a sense of athleticism, the BRICS Games also help to improve collaboration in the area of youth policy and broaden cross-cultural interactions via athletics, providing a forum for more in-depth communication. (Okoli, 2024) The primary objective of the BRICS Games is to foster interethnic communication and cultural integration via sport, which acts as a global language. In addition to showcasing physical ability, the Games foster understanding and promote bonds between nations. They fos-

ter togetherness among the nations that make up the bloc, which serves as the foundation for discussions and collaboration in other fields including education, music, and the arts.

The BRICS Games encompass more than just athletic contests. In order to acquaint participants and viewers to the customs and cultural legacy of the participating nations, they are accompanied by cultural festivals, exhibits, and educational initiatives. The bloc’s vast cultural variety is showcased through national dances, music, and theater acts throughout the opening and closing ceremonies. The last BRICS Games were held in Kazan which was the vast project of BRICS countries for the 2024. As a result of games, it can be seen from the citizens’ opinions that they were passionate with games. According to the results of analysis of Brandanalytics.ru, main opinions were stated that: “The BRICS Games are an alternative to the Olympics, free from political interference. The Games are described as fair competitions without Western interference, without doping scandals. Users highly appreciated the development and popularization of the BRICS Games, which are increasing each time they are held”. (Brandanalytics.ru, 2024)

Thus, by presenting the bloc as an alliance committed to a just and equitable global order, the BRICS Games serve to advance the idea of “soft power” on the global scene. Such events, which compete with sporting endeavors that are mostly focused on the West, provide an alternate strategy for international collaboration in which connection between cultures and sports is crucial.

As a result, efforts and programs to improve cultural relations and employ “soft power” techniques are still being developed today. The exchange of cultural legacy, its popularization, and the mutual enrichment of the participating nations are their primary objectives. The declarations made at the BRICS summits, which are supported by actual practice, make it feasible to carry out such activities. However, by analyzing all data and statistics, cultural rights issues are only discussed in relation to heritage conservation, and there is no centralized platform for tracking cultural initiatives and their efficacy. The BRICS countries still have work to do on this aspect to develop centralized platform of some other mechanism.

The role of the 16th BRICS Summit 2024 and Kazan Declaration

In 2024, the BRICS Summit in Kazan was held in the BRICS+/Outreach format from 22 to 24 October. The Summit was held under the slogan “Strengthen-

ing Multilateralism for a Fairer and More Democratic World Order". All countries reaffirmed their commitment to strengthening global governance by promoting an international and multilateral system that is more responsive, effective, sufficient, representative, legitimate, democratic and accountable. The Kazan Declaration was an important step forward in the development of both the international system and BRICS cultural diplomacy. The agreement calls for closer cooperation in the fields of science, education and culture. Particular attention is paid to digital innovations that allow BRICS countries to overcome geographical and cultural barriers (Kazan Declaration, 2024). The Kazan Declaration emphasized the value of humanitarian exchanges to improve intercultural relations among countries and proposed several creative programs. UN resolutions serve as a basis for many initiatives. The International Day of Dialogue among Civilizations (A/RES/78/286), one of the first resolutions adopted by the UN General Assembly, calls for increased efforts to ensure respect for cultural diversity. In addition, the growth of cultural exchanges was guided by the values of the UNESCO Constitution and the UNESCO Framework Program for Arts and Culture Education, which was unanimously adopted in February 2024 in Abu Dhabi, United Arab Emirates (Kazan Declaration, 2024).

The development of new initiatives, such as the BRICS Folk Dance Culture Alliance and the proposal to establish a BRICS Film Schools Alliance, is given special attention. In addition, the Kazan Declaration calls for the creation of a single online platform for the BRICS countries for trade in cultural goods. This will improve interaction between artists, educational institutions and cultural groups. The Declaration also emphasizes the value of supporting young talent through the funding of programs and competitions. Thus, in addition to key elements of business and geopolitics, the Kazan Declaration also outlined trends that need to be formed within the BRICS framework for the era of digitalization in the humanitarian context.

Challenges and Critiques of Cultural Diplomacy of BRICS

One of the most important components of soft power, cultural diplomacy can promote cultural values, build bridges between countries and improve a country's reputation. In today's world, where Western values dominate, cultural diplomacy offers the BRICS an opportunity to unleash the potential of other aspects and directions in terms of both civiliza-

tional and cultural dimensions. However, its implementation faces many institutional obstacles and its influence remains limited, which calls into question its effectiveness in international politics. Despite lofty claims, BRICS cultural diplomacy is poorly organized and underfunded. Film festivals, art exhibitions and student exchange programs are examples of large-scale projects that are often scattered and do not effectively reach audiences outside the member states. Moreover, cultural initiatives tend not to develop into long-term plans, but rather remain symbolic gestures. However, the little money spent on cultural diplomacy is insignificant compared to the significant soft power expenditures made by Western countries, making it impossible for the BRICS to compete effectively on the international stage.

The Western cultural framework has a greater influence on the BRICS cultural diplomacy worldwide. Unlike the US soft power, which is represented in Hollywood, music and famous companies around the world, the BRICS have not yet become a visible cultural force. Although Brazil uses football and carnival, India uses Bollywood and China uses Confucius Institutes to promote their culture, these initiatives are largely regional in scope and are not related to the BRICS as a whole. It is difficult for the BRICS to promote new cultural alternative narratives, as the existing ones are still strong, well-organized and effective. The potential of the BRICS to influence world opinion is further limited by the fact that these efforts cannot compete with influential Western media such as the BBC or CNN. Online visibility is essential for cultural diplomacy in the digital age. Unlike Western countries, which rely heavily on social media and streaming platforms to promote their cultural assets, BRICS has yet to develop a unified digital strategy, putting it at a disadvantage. The cultural influence of BRICS is diminished by a lack of digital integration, especially among younger audiences who rely heavily on digital platforms for entertainment and information.

The appeal of BRICS cultural diplomacy for neutral or pro-Western countries is diminished because it is often seen as a component of an anti-Western agenda. The bloc's focus on challenging Western dominance serves to perpetuate misconceptions of BRICS as a competitive and reactive organization rather than a useful cultural force.

Despite the ambition of the attempt, BRICS cultural diplomacy faces a number of internal and external obstacles. Its effectiveness is limited by internal political disputes, a lack of coordination, a minimal online presence, and a lack of funding.

To increase its influence, BRICS needs to develop a comprehensive plan and implementation strategy that takes into account both the national characteristics of each member state and their combined potential. Thus, BRICS cultural diplomacy risks remaining a regional endeavor with limited global impact unless internal disputes are resolved and resources are increased.

Conclusion

This study attempted to obtain results that are aimed at a better understanding of the theoretical and practical approaches to cultural diplomacy in the BRICS countries.

The first important conclusion is how cultural diplomacy can strengthen the position of BRICS as an informal interstate association at the international level.

This study confirms that cultural diplomacy is an important foreign policy tool in the context of globalization, necessary for increasing recognition and promoting other interests along with the humanitarian agenda. Thus, BRICS cultural programs promote respect, understanding and cooperation between member states, considering various types of these activities. This improves not only the image of the BRICS bloc at the international level, increases its attractiveness in addition to strengthening political and economic relations.

The Kazan Declaration of 2024, which is important for strengthening multipolarity in complex international realities, is also important for promoting cultural diplomacy within BRICS. The Declaration is important in its focus on strengthening ties between member states and aiming to update the methods of cultural diplomacy. The Kazan Declaration, which reflects the BRICS commitment to the values of multipolarity and cultural exchange, becomes more relevant in the current geopolitical environment where there is a pressing need for multilateral cooperation and understanding.

The study also highlights the importance of modifying cultural diplomacy to fit the rapidly changing realities of digital change and globalization. It draws attention to how BRICS countries could collaborate more closely using digital platforms and creative methods of disseminating cultural values. These tools

significantly increase the prospects for intercultural interaction and exchange, as many member countries are already actively promoting their cultures through digital platforms.

The study also suggests expanding the reach and improving the practice of promoting cultural diplomacy in BRICS through the development of its institutionalization and mechanisms for more coordinated promotion. This should include developing more creative and comprehensive projects to address contemporary issues, including digitalization, cultural diversity and the use of multimedia platforms. These initiatives are necessary to ensure that in a rapidly changing global order, cultural diplomacy continues to be a useful and effective tool, particularly within the BRICS framework. However, the study also acknowledges the significant internal and external barriers that BRICS cultural diplomacy faces. The bloc's ability to present a cohesive and powerful cultural identity on the international stage is weakened by challenges such as poor coordination, political disagreements, lack of funding and limited reach. To overcome these limitations, BRICS must prioritize the creation of a unified strategy that balances the individual strengths of each member state with their common goals. Thus, it can be said that BRICS cultural diplomacy is a shining example of the bloc's aspiration to create a unique political and cultural narrative in the modern world. The bloc's commitment to cultural cooperation and the importance of intercultural dialogue in promoting peace and sustainable development are demonstrated in the Kazan Declaration 2024 and its provisions. Going forward, creative strategies such as digitalization of cultural projects and expansion of the scope of international cultural events will be important for promoting cooperation and mutual understanding among the peoples of the BRICS countries and beyond. Ultimately, the bloc's ability to implement strategic plans, cope with external obstacles and adapt to the changing political environment will determine how successfully BRICS cultural diplomacy will develop in the future. At the same time, BRICS cultural diplomacy can become a vital tool for promoting the common values of the BRICS countries: respect, cooperation and coordinated international participation in the context of the development of a new world order and complex multipolarity.

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BRIDGING THE GAP IN WATER GOVERNANCE: LESSONS FROM GLOBAL PRACTICES AND THE TRANSITION TO INTEGRATED WATER RESOURCES MANAGEMENT (IWRM)

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Abstract. This study examines global experiences and best practices in water resources management, emphasizing the transition from traditional control-focused frameworks to Integrated Water Resources Management (IWRM). The analysis underscores the necessity for comprehensive, adaptive strategies in response to climate change, socio-economic shifts, and urbanization. Highlighting the success of collaborative models such as the European Union Water Framework Directive, the research identifies critical differences between the approaches of post-Soviet states and EU nations, particularly in public participation, goal-setting, and implementation strategies. Case studies demonstrate the economic and environmental benefits of innovative methods like wastewater reuse and advanced water purification technologies. The findings advocate for enhanced cooperation among stakeholders, comprehensive policy integration, and the adoption of modern assessment tools to improve water quality and sustainability. This work aims to inform policymakers and practitioners on developing efficient and equitable water governance systems that address current and future challenges.

Keywords: Integrated Water Resources Management (IWRM), sustainable development, adaptive strategies, water framework directive, climate change

Introduction

Water resources management has reached a critical juncture on a global scale, driven by the intersecting forces of rapid urbanization, industrial expansion, and the escalating impacts of climate change. These interconnected challenges place immense pressure on the availability, quality, and sustainability of water resources, making effective governance an urgent priority. Water governance, as the linchpin of sustainable development, requires a multifaceted approach that balances environmental preservation, economic growth, and social equity. The stakes are high: water scarcity threatens livelihoods, food security, and ecosystems, while water mismanagement exacerbates inequality and hinders economic progress. Consequently, there is a growing consensus among policymakers, researchers, and practitioners on the need for innovative strategies that transcend traditional, fragmented methods.

Integrated Water Resources Management (IWRM) has emerged as a comprehensive framework to address these complexities. Rooted in principles of inclusivity, collaboration, and adaptability, IWRM emphasizes the need for cohesive planning that integrates various sectors, such as agriculture, industry, and urban development. This framework aims to harmonize water use across competing demands while ensuring that ecosystems are preserved for future generations. Importantly, IWRM does not operate in isolation; it incorporates the contributions of technology, governance reform, and public participation to create resilient water management systems.

This paper delves into the evolution of water management strategies, focusing on the transition from control-based, centralized approaches to the more adaptive and participatory practices embodied by IWRM. A key highlight is the examination of the European Union's Water Framework Directive, a pioneering initiative that demonstrates the practi-

cal application of IWRM principles. This directive represents a milestone in global water governance, showcasing the power of integrated planning, stakeholder engagement, and science-based policymaking. It has not only elevated water quality across EU member states but also set a global benchmark for holistic water management.

Contrasting this with the experiences of post-Soviet nations, the paper explores the barriers that hinder progress toward sustainability in these regions. Often constrained by rigid governance structures and a legacy of control-oriented policies, these countries face significant challenges in aligning with contemporary global standards. Public participation, a cornerstone of effective water governance, remains underdeveloped in many post-Soviet states, further complicating efforts to achieve integrated management. The study highlights the critical need for reforms that promote inclusivity, transparency, and accountability.

Furthermore, this research investigates the transformative potential of advanced technologies in addressing water scarcity and quality challenges. Innovations such as wastewater reuse and advanced purification methods demonstrate substantial economic and environmental benefits. By integrating these technologies into broader water governance frameworks, societies can enhance resource efficiency, reduce environmental degradation, and create sustainable solutions tailored to local contexts.

The convergence of governance, technology, and public engagement lies at the heart of achieving water security in the face of mounting ecological and societal pressures. This paper argues that the path to resilience involves not only the adoption of advanced strategies but also a cultural shift toward recognizing water as a shared, finite resource. By examining case studies and drawing lessons from diverse global practices, this research aims to provide actionable insights for policymakers, practitioners, and stakeholders. Ultimately, it underscores the urgent need for coordinated efforts to secure water resources for present and future generations while navigating the complex interplay of environmental, economic, and social dimensions.

Methodology

The objective of this study is to identify the main challenges in water resources management at the present stage and to provide a brief overview of the best international experience and practice in water resources management, with an emphasis on the transition to integrated water resources management

(IWRM). By examining key international frameworks, including the European Union Water Framework Directive, and comparing them with post-Soviet approaches, the study seeks to identify effective strategies for achieving water sustainability and security. Specific objectives include assessing the role of public participation, adaptive management and technological innovation in addressing issues such as climate change, urbanization and water scarcity.

The results of the comparative analysis revealed significant differences in water resource management approaches between the European Union and post-Soviet states. These differences were primarily observed in governance structures, public participation levels, and the overall approach to policy implementation. In the European Union, there is a clear emphasis on results-based planning, which contrasts with the action-oriented commitments more common in post-Soviet countries. This distinction highlights the challenges faced by post-Soviet states in adopting modern, integrated water management frameworks.

The primary sources for the analysis were the European Union Water Framework Directive (WFD) and other relevant EU directives that establish the framework for water governance within member states. Among these directives, the Urban Wastewater Treatment Directive (UWWTD), the Nitrates Directive (ND), and the Drinking Water Directive (DWD) were specifically examined for their focus on water pollution control, nutrient management, and drinking water quality standards. These documents were critical for understanding the regulatory environment and guiding principles that shape water governance within the EU.

Literature Review

Water resources management has undergone significant transformation, evolving from traditional, centralized approaches to adaptive frameworks such as Integrated Water Resources Management (IWRM). This shift reflects the increasing recognition of water's multifaceted role in ecological balance, economic growth, and social equity. The reviewed literature highlights distinct thematic areas within water governance, focusing on geopolitical, economic, technological, and legal dimensions, as well as public participation and collaborative governance.

Several studies explore the geopolitical implications of water management, emphasizing transboundary water cooperation and regional frameworks. For instance, Havekes et al. (2016) outline the founda-

tional principles of effective water governance, such as transparency, accountability, and stakeholder participation, which are critical in addressing transboundary water disputes. Meanwhile, Burghard, Meyer, and Kakabayev (2015) examine water governance in Kazakhstan, highlighting the necessity for regional collaboration and shared water management frameworks to balance agricultural, industrial, and urban demands.

Economic sustainability is a central focus for many researchers. Marques et al. (2024) investigate the integration of water charges policies with watershed plans, demonstrating how financial instruments like water pricing can drive sustainable resource allocation and investment. López-Morales and Rodríguez-Tapia (2019) offer a detailed economic analysis of wastewater reuse in the Mexico Valley Basin, illustrating the potential cost-effectiveness of such strategies in regions facing water scarcity. Similarly, Awad et al. (2019) conduct life-cycle assessments of wastewater treatment technologies, providing insights into cost-efficient solutions for developing countries.

Technological advancements play a pivotal role in addressing water quality and scarcity challenges. Barakat (2011) highlights the potential of adsorption methods for industrial wastewater treatment, showcasing their cost-effectiveness and environmental benefits. Diaz-Elsayed et al. (2019) explore wastewater-based resource recovery technologies, emphasizing their contributions to circular economy goals by recovering energy, nutrients, and water. The application of such technologies is further supported by studies like Macchiaroli et al. (2019), which propose innovative models for selecting urban water infrastructures that balance technical and sustainability criteria.

The importance of collaboration and public participation in water governance is a recurring theme. Margerum and Robinson (2015) discuss the complexities of building collaborative partnerships, identifying trust and dialogue as critical components for overcoming institutional and power barriers. Bekov (2024) examines Kazakhstan's Water Code, underscoring the legal foundations required to support inclusive and participatory water governance. These studies collectively stress the necessity of stakeholder engagement to achieve equitable and sustainable outcomes.

The European Union's Water Framework Directive (WFD) serves as a benchmark for integrated water governance, focusing on achieving ecological and chemical goals through measurable outcomes

and stakeholder engagement. Studies emphasize the directive's reliance on modeling tools and risk-based strategies to address water quality challenges. In contrast, post-Soviet governance systems face significant barriers, including fragmented institutional responsibilities and outdated methodologies. Research calls for a transition from pollution indices to integrated ecological indicators to better capture complex ecosystem dynamics.

Despite advancements, persistent challenges include financial constraints, outdated infrastructure, and insufficient cross-sectoral collaboration. The literature highlights the importance of aligning water management strategies with sustainable development goals. This involves integrating flood and drought management programs, leveraging advanced technologies, and fostering societal awareness to address systemic inefficiencies. Case studies from Italy, Egypt, and other regions demonstrate the feasibility of innovative solutions, underscoring the need for adaptive, context-specific approaches to water governance.

From Control to Cooperation: Advancing Sustainable Water Management through Integrated Approaches

The transition from control to cooperation in water management underscores the necessity of dynamically evolving frameworks that integrate both regulatory mechanisms and collaborative strategies. This paradigm shift emphasizes collective welfare and sustainable water security, acknowledging the complex interplay between urbanization, industrial development, and the sustainability of water resources. Rapid urban growth and industrial expansion have intensified both water consumption and wastewater production. However, these challenges, if addressed effectively, can align with broader sustainable development objectives. Industrial water treatment, for instance, has demonstrated considerable potential, both economically and ecologically. Through advanced methods such as adsorption techniques, water quality can be restored with minimal costs, showcasing a promising pathway for resource recycling and environmental conservation (Barakat, 2011).

Despite these advancements, several barriers impede the implementation of advanced water treatment technologies. Financial constraints, inadequate infrastructure, and policy limitations often deter policymakers from embracing comprehensive wastewater management systems. There is a pervasive perception that such systems are prohibitively expensive, yet case studies, including those conducted in

Hamas, Egypt, reveal that investments in full-cycle wastewater treatment yield substantial environmental and economic returns (Awad et al., 2019). Furthermore, selective recovery approaches, which tailor quality standards to specific reuse purposes, present significant economic and environmental benefits. However, these methodologies demand careful selection of technologies and effective pollutant management strategies to optimize their impact.

The intricate relationship between economic factors and environmental sustainability highlights the critical role of integrated frameworks in water resource management. Research underscores the connection between GDP and water stress as determinants of wastewater treatment efficiency and resource reuse. For example, strategic aquifer utilization in the Mexico City Basin has been shown to reduce regional water consumption by 13%, alleviating the burden on purification systems and fostering more effective resource management (López-Morales & Rodríguez-Tapia, 2019). Such integrated approaches must also incorporate societal participation, which is essential for fostering innovation, protecting ecosystems, and engaging the public in sustainable water management practices.

A comparative analysis reveals a stark contrast between modern water management strategies and those employed during the Soviet era. Earlier methodologies relied predominantly on basic pollution indices, which inadequately addressed the complexity of aquatic ecosystems. These simplistic numerical indicators often failed to capture the intricate interdependencies within ecosystems, resulting in a limited understanding of water quality. Visual indicators, such as water color, provided superficial assessments, further emphasizing the need for more sophisticated evaluation metrics. To address contemporary challenges, transitioning to comprehensive indices that incorporate both quantitative and qualitative factors is crucial. By integrating ecosystem dynamics into water quality assessments, modern frameworks can effectively respond to the multifaceted challenges of water management, ensuring sustainability and resilience in the face of evolving global demands (Danilov-Danilyan et al., 2019).

The European Union Water Framework Directive

The European Union Water Framework Directive (WFD) exemplifies a modern, integrated approach to water governance. Adopted in 2000, the directive establishes comprehensive methodologies for assessing and improving water quality across diverse

resources, including surface, coastal, and groundwater systems. Its primary objective is achieving «good ecological and chemical status» for all water bodies, with stringent deadlines for implementing necessary measures (European Parliament and Council, 2000).

A distinctive feature of the WFD is its shift from traditional chemical monitoring to biological assessments, prioritizing ecosystem health as an indicator of water quality. Biological assessment methodologies analyze species diversity, ecosystem functionality, and habitat conditions to provide a holistic understanding of water systems. For instance, the return of salmon to the Rhine River has been a symbolic measure of ecological restoration, reflecting broader improvements in water quality.

The European Union (EU) has developed a comprehensive framework for managing and protecting water resources through a series of directives that emphasize sustainability, integration, and adaptive governance. Central to this framework is the **Water Framework Directive (WFD) 2000/60/EC**, which establishes the overarching principles for water policy across member states. Complementary directives, such as the **Urban Wastewater Treatment Directive (UWWTD) 91/271/EEC**, the **Nitrates Directive 91/676/EEC**, and the **Drinking Water Directive (DWD) 98/83/EC**, provide specific guidelines addressing pollution control, nutrient management, and water quality standards.

Adopted on October 23, 2000, the **Water Framework Directive (WFD)** represents a paradigm shift in water management by promoting an integrated and basin-wide approach. Its primary objective is to ensure all EU water bodies—surface, coastal, and groundwater—achieve “good ecological and chemical status” by specified deadlines. The Water Framework Directive (WFD) adopts a multifaceted approach to water resource management, emphasizing three core principles: risk-based management, ecological focus, and stakeholder participation. These principles collectively aim to ensure the sustainable and adaptive governance of water systems across the European Union.

A central tenet of the WFD is the reliance on risk-based management, which involves the systematic identification, assessment, and mitigation of potential threats to water quality and ecosystem health. The directive advocates for the application of **environmental modeling** and **predictive tools** as critical instruments in this process. By simulating various management scenarios, these tools enable the evaluation of intervention outcomes, helping decision-makers to identify strategies with the most favorable

ecological, economic, and societal impacts. This proactive and evidence-based approach minimizes uncertainties and enhances the effectiveness of resource allocation.

The WFD moves beyond traditional metrics of water quality, prioritizing **biological indicators** as integral measures of ecological health. Indicators such as species diversity, population dynamics, and the presence or absence of specific taxa provide a more comprehensive understanding of ecosystem conditions compared to chemical metrics alone. For instance, the return of salmon populations to the Rhine River has served as a biological marker of improved water quality and habitat restoration. This ecological focus reflects the directive's commitment to preserving and restoring the structural and functional integrity of aquatic ecosystems, ensuring they provide essential services sustainably.

Recognizing the complexity and interconnectedness of water governance, the WFD emphasizes collaboration among diverse stakeholders (Curşeu, P. L., & Schruijer, S. G. 2017), including public authorities, industry representatives, environmental organizations, and the broader civil society. This participatory approach fosters inclusivity and transparency, ensuring that water management decisions align with societal priorities while addressing local and regional challenges. Moreover, engaging multiple stakeholders enhances the legitimacy of policy decisions and promotes shared responsibility in their implementation.

By integrating these principles, the Water Framework Directive establishes a robust and adaptive framework for achieving sustainable water management outcomes, setting a precedent for other regions aiming to balance ecological, economic, and social objectives. Key milestones for WFD implementation include the identification of competent basin management authorities (2003), characterization of water bodies (2004), and harmonization of national legislation with WFD principles (2005). A critical innovation in the WFD is the classification of water bodies into five ecological states: high, good, moderate, poor, and bad. These classifications rely on integrated assessments of biological, chemical, and hydromorphological parameters. For example, the recovery of salmon populations in the Rhine serves as a biological indicator of improved water quality.

Urban Wastewater Treatment Directive (UW-WTD) 91/271/EEC directive focuses on the treatment of urban wastewater to reduce pollution from industrial and domestic sources. Its implementation has led to the widespread adoption of secondary and

tertiary treatment technologies, significantly reducing nutrient loads in water bodies. Nitrates Directive The Urban Wastewater Treatment Directive (UW-WTD) 91/271/EEC, adopted in 1991, represents a cornerstone of the European Union's efforts to mitigate water pollution originating from urban and industrial wastewater discharges. Its overarching goal is to protect aquatic environments from the detrimental effects of untreated or inadequately treated wastewater by ensuring the adoption of robust treatment standards across member states.

The directive mandates the collection, treatment, and discharge of urban wastewater for agglomerations exceeding specific population thresholds, as well as wastewater generated by certain industrial sectors. A critical focus is placed on areas designated as sensitive zones—regions particularly vulnerable to eutrophication or other ecological damage caused by excess nutrients, such as nitrogen and phosphorus.

The implementation of the Urban Wastewater Treatment Directive (UWWTD) 91/271/EEC has been pivotal in promoting the adoption of advanced wastewater treatment technologies, thereby mitigating pollution from urban and industrial sources.

Secondary treatment, a cornerstone of the directive, employs biological processes to effectively remove organic matter and significantly reduce biochemical oxygen demand (BOD), which is critical for maintaining oxygen levels in aquatic ecosystems. Building on this, tertiary treatment—an advanced stage of wastewater treatment—addresses the removal of nutrients, particularly nitrogen and phosphorus, which are key contributors to eutrophication. These processes have proven indispensable in improving water quality, especially in sensitive zones that are vulnerable to nutrient pollution.

The implementation of these technologies has led to a substantial reduction in nutrient loads discharged into rivers, lakes, and coastal waters, creating a cascading positive effect on the health and resilience of aquatic ecosystems. By controlling nutrient inputs, the directive has not only curbed the proliferation of algal blooms but also supported the recovery of biodiversity, including the return of sensitive species to habitats once deemed inhospitable.

The Nitrates Directive 91/676/EEC represents a pivotal legislative response to the growing issue of water pollution caused by agricultural activities. It aims to safeguard the quality of water resources by addressing nitrate contamination, which poses significant risks to both human health and ecological systems. As a cornerstone of EU environmental policy, the directive establishes a framework for

promoting sustainable agricultural practices while protecting surface and groundwater from excessive nutrient runoff.

One of the most important aspects of the directive is the establishment of Nitrate Vulnerable Zones (NVZs), which are areas where agricultural activities significantly threaten water quality due to high levels of nitrate runoff. Within these zones, the directive imposes strict regulations to control the application of nitrogen fertilizers and manage animal manure more effectively. By establishing these zones, the directive aims to reduce the pollution load on water bodies and protect ecosystems from nutrient overloads (Łopata, M., Grochowska, J. K., Augustyniak-Tunowska, R., & Tandyrak, R. 2023), which can lead to harmful algal blooms and the depletion of oxygen levels in water.

The directive's approach is multifaceted. It mandates that farmers reduce the amount of nitrogen-based fertilizers applied to their fields, particularly during times when crops are not able to absorb the nutrients efficiently. This is achieved by setting limits on fertilizer use and encouraging more precise and targeted application methods. Additionally, the directive emphasizes the importance of sustainable manure management. Farmers are required to carefully control the storage and spreading of animal manure, ensuring that it is done in a way that minimizes the risk of nitrates leaching into the soil and, subsequently, into groundwater systems. Proper manure management practices are essential to reducing nitrate pollution, as improperly stored or applied manure can contribute significantly to nitrate contamination.

Moreover, the directive encourages crop and soil management practices aimed at reducing nutrient runoff. These practices include crop rotation and the use of cover crops, which help retain nutrients in the soil and prevent erosion. Such agricultural techniques enhance soil fertility while simultaneously reducing the amount of nitrogen that leaches into water sources. By promoting these methods, the directive helps farmers maintain productive and sustainable agricultural systems without compromising water quality.

Since its implementation, the Nitrates Directive has led to notable improvements in water quality across the EU, particularly in regions where agriculture is intensive. It has helped mitigate the effects of nutrient pollution by reducing nitrate concentrations in both groundwater and surface water bodies. In doing so, it has contributed to improving the health of aquatic ecosystems and ensuring the safety of drinking water supplies. However, the directive is not without its challenges. The issue of diffuse pollution

from agricultural runoff remains complex, as it is difficult to pinpoint and control at the individual level. Effective implementation requires continuous monitoring, enforcement of regulations, and adaptation to regional environmental conditions.

In conclusion, the Nitrates Directive 91/676/EEC has played a crucial role in addressing nitrate pollution across Europe, fostering more sustainable agricultural practices while protecting water resources. While progress has been made, there is still much work to be done, particularly in ensuring consistent enforcement and addressing emerging environmental pressures such as climate change. The directive remains an essential tool in the EU's efforts to balance agricultural productivity with environmental sustainability, and its success depends on the ongoing collaboration between governments, farmers, and environmental stakeholders.

The Drinking Water Directive (DWD), formally known as **Directive 98/83/EC**, was established by the European Union to ensure that water supplied for human consumption meets the highest standards of safety and quality. Adopted in 1998, this directive set out to safeguard public health by regulating the quality of water intended for drinking, recognizing water as one of the most vital and fundamental resources. The primary goal of the DWD is to ensure access to safe drinking water across the EU, protecting consumers from waterborne diseases and harmful contaminants.

A central component of the DWD is the establishment of stringent water quality standards, which specify the maximum allowable concentrations of various pollutants in drinking water. These standards cover a broad range of contaminants, including microbiological substances, chemicals, and radioactive elements, ensuring that water quality remains within safe limits. The directive sets specific limits for substances such as lead, nitrates, pesticides, and coliform bacteria, all of which pose potential health risks if present in excessive concentrations. These standards are designed to protect vulnerable populations, including children and the elderly, who are at greater risk of adverse health effects from contaminated water.

The monitoring and testing requirements outlined in the DWD are another key aspect of the directive. Water suppliers are mandated to conduct regular testing of drinking water to ensure that it consistently meets the established quality standards. This includes routine testing for microbiological contaminants, such as *E. coli*, as well as chemical pollutants. Water suppliers are also required to keep detailed records

of these tests, and the results must be made publicly available to consumers, ensuring transparency and fostering trust in the safety of drinking water. In this regard, the DWD emphasizes the importance of public access to information, which is crucial for raising awareness and empowering individuals to make informed decisions about their water supply.

The directive also highlights the role of infrastructure and maintenance in ensuring the delivery of safe drinking water. It mandates that water supply systems, including pipes, storage tanks, and treatment facilities, are properly maintained and operated to prevent contamination. Regular inspection and maintenance of these systems are necessary to prevent any disruptions in water quality, which can occur due to aging infrastructure or unforeseen events such as natural disasters. In some cases, water suppliers may be required to implement corrective measures, such as upgrading old infrastructure, to meet the directive's standards.

One of the significant developments in the DWD is the emphasis on risk management. The directive encourages a preventative approach to managing water safety by promoting the Water Safety Plan (WSP) methodology. This methodology involves identifying potential hazards in the water supply system, assessing the risks associated with these hazards, and implementing appropriate measures to prevent or mitigate those risks. By adopting a proactive approach, the DWD aims to reduce the likelihood of contamination and ensure the continued safety of drinking water sources.

Furthermore, the revision of the Drinking Water Directive in 2020 (Directive (EU) 2020/2184) introduced a series of important updates, aiming to strengthen the protection of public health and improve water quality across Europe. This revision includes new provisions related to the reduction of lead concentrations in drinking water, the monitoring of new and emerging contaminants, and the improvement of accessibility to drinking water in public places. The revised directive also highlights the need for better protection of water resources from pollution and emphasizes the role of sustainable water management practices.

While the DWD has been successful in improving the quality of drinking water across the EU (Heidari, B., Randle, S., Minchillo, D., & Jaber, F. H. 2023) challenges persist, particularly in the context of aging infrastructure, climate change, and emerging contaminants. Issues such as the increasing presence of microplastics, pharmaceuticals, and other trace chemicals in water sources require ongoing

monitoring and innovation in treatment technologies. Additionally, the potential impacts of climate change, including droughts and flooding, may affect the availability and quality of water resources, posing new challenges for drinking water safety.

In conclusion, the Drinking Water Directive (98/83/EC) plays a pivotal role in ensuring the safety and quality of drinking water in the European Union. By setting clear standards for water quality, promoting transparency in monitoring, and encouraging proactive risk management, the directive has significantly contributed to public health protection across the EU. However, as new challenges arise, the directive must continue to evolve, incorporating the latest scientific knowledge and technological advancements to address emerging threats and ensure the long-term sustainability of water resources.

While the European Union's water directives – notably the Water Framework Directive (WFD) 2000/60/EC, the Urban Wastewater Treatment Directive (UWWTD) 91/271/EEC, the Nitrates Directive (ND) 91/676/EEC, and the Drinking Water Directive (DWD) 98/83/EC – collectively represent a comprehensive and progressive approach to water governance. These directives are not only designed to manage water resources efficiently but also reflect a significant shift from traditional, fragmented management systems to more integrated, sustainable practices based on ecological integrity, public health, and collaboration between various stakeholders.

The Water Framework Directive (WFD), as the cornerstone of EU water policy, lays down a robust foundation for managing water across member states. By focusing on achieving good ecological and chemical status for all water bodies, it provides a framework that prioritizes ecological health while incorporating social, economic, and environmental factors. This holistic approach is particularly relevant in the context of Integrated Water Resources Management (IWRM), a concept that promotes the sustainable management of water resources through coordinated action across sectors, scales, and stakeholders. The UWWTD, ND, and DWD complement the WFD by addressing specific issues related to wastewater treatment, nutrient pollution, and drinking water safety. Each of these directives introduces regulations that contribute to reducing environmental pressures on water systems, such as nutrient overloading, pollution from wastewater, and harmful chemicals in drinking water.

The transition from traditional control-based management to integrated, goal-oriented strategies within the EU's water directives provides a com-

elling model for water governance that can inform practices in other regions, including post-Soviet countries. While there are differences in water governance approaches due to historical, cultural, and political contexts, the EU directives highlight the importance of developing adaptive, science-based frameworks that align with both ecological imperatives and societal needs. For post-Soviet states, learning from the EU's success in setting clear standards, fostering collaboration, and emphasizing transparency in water quality monitoring could help overcome the challenges of fragmented water management and unsustainable practices.

The effectiveness of these EU water directives underscores the importance of policy harmonization, where governance frameworks align with environmental sustainability goals, and the need for stakeholder collaboration. The implementation of these directives, backed by sound scientific research and consistent monitoring, has proven to be essential in mitigating pollution, improving water quality, and preserving aquatic ecosystems. These lessons offer valuable insights into the importance of creating policies that can adapt to emerging challenges while ensuring that water resources are managed in a way that benefits both current and future generations.

In summary, the EU's water governance model, shaped by these directives, serves as a powerful example of how integrated water management frameworks can lead to improved environmental outcomes. By harmonizing policy frameworks with ecological and societal needs, these directives contribute to long-term environmental sustainability and offer a pathway for achieving IWRM goals globally. Their successful implementation offers valuable lessons that can guide other regions, including post-Soviet states, in their transition towards more sustainable, adaptive, and inclusive water management practices.

Addressing Challenges in Post-Soviet States

Post-Soviet states face a multitude of challenges when attempting to adapt their water governance systems to global standards of sustainable management. These countries, while navigating the legacies of centralized, top-down governance, struggle with both institutional inertia and a lack of adaptive frameworks. The historical focus on control-oriented policies in these nations has led to rigid, inflexible water management structures that are ill-suited for addressing contemporary environmental challenges such as climate change, pollution, and resource scarcity. In contrast to the European Union's results-based planning framework, which emphasizes measurable objectives

and long-term environmental sustainability, many post-Soviet countries continue to follow action-based commitments. This means that rather than focusing on specific, attainable goals, they concentrate on a series of activities that may lack strategic coherence or the capacity to achieve meaningful outcomes.

One of the most critical challenges for post-Soviet states is the absence of clear, measurable objectives in their water management frameworks. Without well-defined, quantifiable targets, water management initiatives often suffer from poor allocation of resources, making it difficult to evaluate success or failure. In many cases, policies are designed without an understanding of their long-term environmental or social impact, contributing to a cycle of ineffective governance. The lack of measurable goals also complicates efforts to integrate adaptive management strategies, where policies and actions are adjusted based on ongoing feedback and emerging challenges.

The rigid governance structures inherited from the Soviet era exacerbate the issue, as water management remains highly centralized, with decision-making power concentrated in the hands of a few national actors. This centralization often leads to a disconnection from local realities, where water issues are best understood and addressed. Local communities (Yasuda, Y., & ., Demydenko, Y., 2024), who are often the most impacted by water quality and availability, are frequently excluded from the decision-making process. The lack of stakeholder engagement prevents water management policies from being more inclusive, transparent, and tailored to the diverse needs of affected populations. This results in policies that may be ineffective or irrelevant at the local level, thereby reducing their long-term sustainability.

To address these significant governance gaps, Integrated Water Resources Management (IWRM) offers a compelling alternative. The IWRM approach emphasizes the need for a holistic, cross-sectoral perspective on water resources that balances social, economic, and environmental objectives. One of the key features of IWRM is its ability to incorporate risk assessments into water management planning, enabling countries to anticipate and mitigate potential risks associated with water scarcity, pollution, and climate variability. This approach fosters more adaptive management—a process of continuous learning and adjustment in the face of uncertainty and changing conditions.

In countries such as Belarus, Azerbaijan, and Kazakhstan, substantial progress has been made in integrating IWRM principles into national water governance frameworks. Legislative reforms in these

countries have paved the way for more collaborative and decentralized water management practices. However, these transitions remain a work in progress, and considerable efforts are required to bridge the gaps between policy, practice, and community involvement. For example, Kazakhstan's Government (2019) has worked to implement river basin management, a central component of IWRM, but challenges remain in fully realizing the potential of this approach due to institutional fragmentation and insufficient local capacity.

The shift toward IWRM in post-Soviet states also necessitates technological innovations that can bolster water quality monitoring, resource management, and decision-making. Tools such as real-time water quality monitoring systems, geographic information systems (GIS), and environmental modeling are crucial in supporting data-driven decisions. These technologies can help track pollutants, forecast water availability, and assess the effectiveness of water treatment practices. By incorporating such technologies into national and local water governance, post-Soviet states can make more informed decisions that support both sustainability and resilience.

Additionally, data transparency and open access to information are essential for fostering trust and participation among stakeholders. Providing access to water data can empower local communities, businesses, and civil society organizations to participate in water management decisions and advocate for their interests. This openness can also stimulate innovation, as different actors—ranging from governments to private entities—can contribute to solutions that might otherwise have been overlooked in a more closed, centralized system.

Post-Soviet countries have much to gain from aligning their water governance systems with global best practices, particularly those established within the European Union's water directives, such as the Water Framework Directive (WFD). While the EU's directives focus on achieving a good ecological and chemical status for water bodies, they also emphasize the need for a strong legal and institutional framework, stakeholder engagement, and effective implementation strategies. By drawing on the experience of EU member states, post-Soviet countries can harmonize their policies, learn from successes and failures, and ultimately create more sustainable and effective governance systems. However, this alignment will require overcoming political, cultural, and institutional barriers that may resist reform.

Effective water governance in post-Soviet (Altingo, M. S. 2022) countries will require multi-level

governance structures that facilitate coordination between national, regional, and local authorities. The decentralized, participatory approach inherent in Integrated Water Resources Management (IWRM) necessitates strong coordination and communication across all levels of government. For instance, national ministries may be responsible for setting legal frameworks and broad policy goals, but local authorities and regional agencies must take the lead in implementing these policies and addressing localized water challenges. Coordination between levels of government is also essential for monitoring water quality, managing water allocations, and ensuring that national strategies are appropriately tailored to regional and local needs.

At the same time, effective policy coordination must extend beyond national borders. In regions such as Central Asia, shared water resources cross multiple countries, requiring cross-border cooperation for effective governance. Collaborative transboundary water management agreements—such as those seen in the Aral Sea Basin—are necessary to prevent resource conflicts and ensure the equitable distribution of water resources.

Results

Effective water resources management is increasingly recognized as a cornerstone of sustainable development, requiring the integration of environmental, economic, and social dimensions. By examining global practices, this study highlights the transition toward integrated approaches such as IWRM, alongside the technological and policy innovations driving progress. The findings provide insights into both successful frameworks and persistent challenges, offering valuable lessons for advancing sustainable water governance.

Integrated Water Resources Management (IWRM) represents a sophisticated and dynamic paradigm aimed at harmonizing environmental preservation, economic progress, and societal well-being within an integrative framework. This model comprehensively addresses the intricate interdependencies of water systems, emphasizing their indispensable role in sustaining ecological functions, fostering economic productivity, and supporting human livelihoods. The European Union's Water Framework Directive (WFD) exemplifies the operationalization of IWRM principles, serving as a benchmark for comprehensive water management. By mandating sustainable water use practices, promoting multi-level collaborative governance, and establishing strin-

gent water quality standards, the WFD highlights the centrality of balancing ecological integrity with socio-economic imperatives. Additionally, it prioritizes ecosystem restoration and underscores the ethical imperative of intergenerational equity, ensuring that finite water resources are managed responsibly to benefit both current and future populations. The directive's robust framework for stakeholder engagement underscores the significance of participatory governance as a means to address the multifaceted and intersectoral challenges inherent in water resource management, thereby fostering transparency, inclusivity, and adaptive capacity.

Technological innovations significantly enhance the efficacy of IWRM by addressing critical issues related to water treatment and resource optimization. Advanced techniques such as adsorption, selective reuse, and desalination exemplify the potential to tackle complex water quality challenges while reducing environmental impacts. Italy and Egypt, for instance, have demonstrated how integrating these technologies into national water policies can yield substantial benefits. By mitigating pollution levels and enhancing water reuse capacities, these advancements not only contribute to ecological balance but also generate economic advantages. The adoption of circular water management models—centered on reducing waste, recycling water, and recovering valuable byproducts—offers industries a path toward cost efficiency while minimizing their environmental footprint. These models also align with global sustainability objectives, showcasing how innovation can drive progress in water management practices.

Despite these advancements, the implementation of IWRM in post-Soviet states is often hindered by systemic barriers, including centralized control structures, antiquated assessment methodologies, and insufficient public engagement. Centralized governance models in these regions frequently limit the adaptability and inclusiveness essential for effective water management. Traditional reliance on simplistic pollution indices further exacerbates challenges by failing to capture the intricate dynamics of aquatic ecosystems. Moreover, these countries face additional hurdles such as outdated infrastructure and a pressing need for modernization, which often necessitate substantial financial investment. Addressing these issues is critical, yet the scale of the required resources may surpass domestic capacities, highlighting the potential role of external donors in providing financial and technical assistance. Reforming institutional frameworks, updating assessment tools, and fostering international collaboration are impera-

tive steps toward aligning post-Soviet practices with global standards, enabling these nations to strengthen their capacity for sustainable resource management.

The integration of economic and environmental considerations amplifies the transformative potential of IWRM. Efficient resource management practices and innovative water-saving strategies demonstrate the capacity to mitigate scarcity while supporting urban resilience. For instance, through investments in infrastructure, policy reform, and public awareness campaigns, nations have significantly reduced water consumption and improved overall resource efficiency. Such examples underscore the symbiotic relationship between sustainable water management and economic prosperity. Nations prioritizing the sustainable use of water resources often experience enhanced economic growth, increased water security, and greater resilience to the impacts of climate change.

Public engagement emerges as a cornerstone of effective IWRM governance. The European Union's participatory frameworks illustrate how transparent and adaptive decision-making processes can foster trust, accountability, and innovation. By involving citizens, industry representatives, and environmental organizations, the EU ensures that water management strategies reflect the diverse interests and needs of its stakeholders. In contrast, post-Soviet nations must address the deficit of public involvement to unlock the full potential of sustainable water management. Expanding participatory mechanisms can bridge the gap between policy and practice, fostering a sense of ownership and collective responsibility among stakeholders. This inclusive approach is essential for driving long-term ecological and economic stability, as it empowers communities to actively contribute to the preservation and enhancement of water resources.

To conclude, Integrated Water Resources Management (IWRM) offers not merely a methodology but a paradigm shift in how societies approach the critical task of water governance. Its emphasis on integration reflects the interconnected nature of water systems, where ecological, social, and economic dimensions are inseparably linked. IWRM's transformative potential lies in its ability to provide adaptive and context-specific solutions that address the complexity of contemporary water challenges. By fostering synergy among technological advancements, institutional reform, and stakeholder collaboration, IWRM establishes a foundation for sustainable water use that is both resilient and forward-looking.

The global discourse around water governance underscores the growing recognition of water as a

finite yet indispensable resource, whose equitable management is central to achieving broader development goals. While regions such as the European Union have pioneered effective implementation models, their experiences underscore the necessity of strong governance, inclusive participation, and sustained investment. For post-Soviet states and other regions grappling with systemic and infrastructural deficiencies, the pathway forward entails more than replicating existing frameworks—it requires tailoring IWRM principles to local contexts while addressing entrenched institutional barriers and capacity gaps.

Beyond technical and policy solutions, the success of IWRM hinges on cultivating a societal ethos that values water stewardship as a shared responsibility. Public education, cross-sectoral dialogue, and global cooperation are indispensable for fostering a collective commitment to water sustainability. In this regard, the role of international donors and organizations extends beyond financial assistance; it includes facilitating knowledge transfer, capacity-building, and fostering partnerships that can accelerate progress.

As the pressures of climate change, urbanization, and population growth intensify, IWRM's principles offer a roadmap not only for navigating immediate challenges but also for building adaptive capacities that ensure long-term water security. The integration of cutting-edge technologies, coupled with policies that prioritize both equity and efficiency, will be essential for transforming water governance into a cornerstone of sustainable development. Ultimately, the promise of IWRM lies in its ability to balance competing demands while safeguarding the ecological integrity and economic vitality that underpin human well-being.

Discussion

The findings confirm the critical role of integrated and adaptive approaches in addressing global water challenges. The EU Water Framework Directives serve as a model for effective water governance, emphasizing measurable outcomes, biological assessment, and stakeholder collaboration. By setting clear goals and leveraging modeling tools, this framework ensures transparency, accountability, and ecological sustainability.

In contrast, post-Soviet states face systemic barriers to adopting integrated practices. Limited public engagement, fragmented responsibilities, and outdated methodologies underscore the need for policy reform. Transitioning from control-based to results-

driven management requires not only legislative changes but also cultural shifts toward inclusivity and cooperation.

Technological advancements present promising solutions to water quality and resource efficiency challenges. Adsorption methods for industrial wastewater and selective reuse strategies align with the principles of IWRM, offering scalable and sustainable alternatives. However, financial and infrastructure barriers must be addressed to facilitate broader implementation, particularly in developing and transitional economies.

The analysis also highlights the interconnectedness of economic development and water resource sustainability. Investments in comprehensive management systems and advanced technologies yield measurable improvements in water quality, ecosystem health, and economic resilience. For example, integrated wastewater recovery strategies in Southern Italy provided greater ecological benefits than traditional discharge methods, showcasing the value of forward-thinking solutions.

Lastly, the study underscores the importance of public engagement in achieving water management goals. Societal awareness, coupled with participatory decision-making processes, fosters accountability and enhances the legitimacy of water governance frameworks. Encouraging cross-sector collaboration among policymakers, industries, and communities is essential for transitioning to inclusive and adaptive water management systems.

Conclusion

In conclusion, this study emphasizes the critical importance of transitioning to Integrated Water Resources Management (IWRM) as a transformative and adaptive framework to tackle the complex challenges of modern water governance. As the world faces accelerating pressures from climate change, urbanization, and socio-economic shifts, the need for comprehensive, inclusive, and flexible water management strategies has never been more pressing. By integrating technological innovations, fostering inclusive governance, and balancing environmental, economic, and social priorities, IWRM offers a holistic approach to sustainable water governance, ensuring the resilience of water systems in the face of global uncertainties.

The European Union's Water Framework Directives serve as a prime example of a successful IWRM implementation, showcasing the potential of integrated planning, collaborative governance, and

science-based policy development. The WFD's emphasis on adaptive management, stakeholder engagement, and the preservation of water quality highlights its effectiveness in navigating the complexities of water governance, offering a global benchmark for other regions to emulate. These lessons underline the importance of adaptive strategies, transparent decision-making, and accountability, which are pivotal to successful water management.

In contrast, post-Soviet states face substantial challenges in adopting such integrated frameworks. Fragmented institutional structures, outdated water management practices, and limited public participation pose significant barriers to progress. Additionally, these countries struggle with the aging and deteriorating state of their water infrastructure, which further exacerbates the difficulty of transitioning to modern, sustainable water systems. Addressing these barriers requires not only significant financial investments but also targeted institutional reforms that promote transparency, inclusivity, and cooperation among stakeholders.

Furthermore, the adoption of advanced technologies—such as wastewater reuse, desalination, and circular water models—offers promising solutions to

enhance resource efficiency and address water quality issues in post-Soviet nations. However, financial constraints necessitate external support from international donors and cross-sector partnerships to facilitate the necessary technological and infrastructural upgrades. By aligning national policies with global best practices and promoting collaboration across sectors, these regions can overcome systemic barriers and unlock the transformative potential of IWRM.

Ultimately, this research underscores the interdependent relationship between ecological integrity, economic resilience, and social equity in water governance. The sustainable management of water resources is critical not only for addressing current needs but also for securing the well-being of future generations in the face of growing global challenges. By embracing adaptive, inclusive, and forward-thinking approaches, policymakers and practitioners can build resilient water management systems that foster economic prosperity, safeguard environmental resources, and ensure equitable access to water for all. In doing so, they will pave the way for long-term sustainability, improving both local and global water security in an increasingly interconnected world.

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