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Lingering Failure of Sanitation and Growing City Pollutions in the Urban Areas of Nigeria: An Assessment Study of Major Cities of South-western Nigeria

By

Apata O.M., Apata, T.G., and Ogunrewo, O.
Department of Agricultural Economics and Extension Services, University of Ado-Ekiti, Ekiti State, Nigeria.
e-mail: simboapata@yahoo.com

Abstracts

This study examines lingering failure of access to safe and sanitation control in some of the high populated cities in Southwest Nigeria. The study analyzes three types of data to gather information relevant to sanitation control, waste generated and attitude of the indigent against waste disposal among others. Data for this study come from 350 valid respondents that were identified through simple random sampling techniques. In addition, secondary data were sourced from National Core Welfare Indicator Questionnaire (CWIQ) Survey. The study uses regression analysis to examine the characteristics that best explain variation in the measures of attitudes of the indigent access to safe water and waste management and factors that influences it. The study also decomposes various measures of sanitation control by the government and people in charge to assess the relative importance of sanitation control and waste management. Result suggests that perceptions of healthy environment decisions are strongly affected by educational status, locations and access to waste management facilities among others. Households with many members but no access to waste management services are more likely to have multiple wastes littered around. The paper recommended among others mass campaign orientation and sensitization programme on the benefits of living in a hygienic environment

Keywords: Sanitation measures, Core welfare Indicator, Waste management, indigent attitudes, sensitization programme,

Introduction

There are more than one billion people who lack access to a steady supply of clean water and also, there are 2.4 billion people — more than a third of the world's population who do not have access to proper sanitation, mostly in developing countries (Hutton *et al*, 2007; Fewtrell *et al*, 2005; and Pruss *et al*, 2004).. There are records that each year about 6,000 children die every day from diseases that can be prevented by improved water and sanitation services. It was also recorded that over 250 million people suffer from such diseases every year. Access to water and sanitation facilities that is so crucial for human well-being and development has now become a priority concern for the international community (United Nations, 2006).

Water and Sanitation is one of the primary drivers of public health, which means that once we can secure access to clean water and to adequate sanitation facilities for all people, irrespective of the difference in their living conditions, a huge battle against all kinds of diseases will be won (Lee, 2007). Several studies have revealed the cause of human endemic and tragedy all over the world as a result of poor access to safe water and ineffective ways waste that are generated being managed (Toubkiss, 2006;Metha *et al*, 2007). According to World Bank report in 2002, more than 500 million school-age children lived in families without access to improved sanitation and 230 million were without an improved water supply (World Bank, 2005). In addition, inadequate drinking water that prompt women of hauling water from distant sources is often shared by her young daughters, leaving them with neither the time nor the energy for schooling. The implication is that the search for sanitation services have robs poor families of opportunities to improve their livelihoods.

In Sub-Saharan Africa alone, 769 000 children under 5 years of age died annually from diarrhea diseases in 2000–2003.That is more than 2000 children's lives lost every day, in a region where just less than 36% of the population have access to hygienic means of sanitation. Studies have also revealed that hundreds of millions of African, Asian and Latin American families are paying every day in lost income for their lack of access to satisfactory drinking water and sanitation services. Sick people cannot work, while the hours of drudgery collecting buckets of water from distant sources means sapped energy and lost productivity for so many of the world's poor (WSP, 2005).

Past studies have revealed that in the high populated cities of developing countries sanitation services are very poor (Lenton *et al*, 2006, Waterkeyn and Caircross, 2005; Pruss *et al*, 2004). This becomes evidence in some of the high populated cities in Nigeria like, Ibadan, Oshodi, Ogbomosho in Southwest Nigeria have all reported at one time or the other the outbreak of diseases due to poor management of the waste generated and attitude of indigent towards managing waste. As a result of the outbreak of diseases and its poor handling; it has cause the government several billions of money to bring it under control and to treat those that are involved. This money spent could have been put into developmental projects if a cognitive sanitation measures are put in place. What most people do not know is that safe hygiene practices and access to sanitation are crucial for combating the main health threats to children under five, in particular diarrhoea.

Moreover, the government of Nigeria had several times tried to bring the situation under control by designing several measures; providing at the strategic places disposal cans where people can drop their waste, providing disposable nylons and baggage to people in their various homes to tidy their waste, mandatory sanitation days in the home, in the market and other public places. With all these measures, sanitation has failed; often times the carelessness of people to keep to all these rules and regulations have rendered these measures useless. Consequently, this study takes a critical look, why it has a failed, also look at factors influencing poor sanitation; in addition, what is the attitude of the indigent and policy makers towards sanitation services for healthy environment.

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Methodology.
Area of Study
Nigeria is one of the Sub-Saharan Africa (SSA) nations located in the western part of Africa. The country has 36 states plus the Federal Capital Territory (FCT)-Abuja. Nigeria shares its boundary with the Republic of Benin to the west, the Niger republic to the north, the republic of Cameroon and Chad republic to the east, and the Atlantic Oceans forms a coastline of about 92, 377,000 hectares, out of which about 91,077,000 hectares are solid land area. The National Population Commission (NPC) putting the population at 88.5 million in 1991. About 140 Million people live in Nigeria in 2006 with population growth declining to 3.2 percent (FRN, 2007). The selected areas are Oshodi in Lagos, Ibadan and Ogbomosho in Oyo states. Oshodi area was selected based on the population decomposition as the most populous city in Lagos state, likewise Ibadan city in Oyo state. However, the selection of Ogbomosho also in Oyo state was based on the recorded outbreak of cholera in 2004 due largely to poor sanitation control.

Data and Methods
The study administered questionnaire on 350 valid respondents in the area of study and held Focus Group Discussions (FGDs) in each community visited. Also, interviews were held with indigent and local government officials and other stakeholders in the management of waste and sanitation. The study uses regression analysis to examine the characteristics that best explain variation in the measures of attitudes of the indigent in waste management and factors that influences it. In addition, the study decomposes various measures of sanitation control by the government and people in charge to assess the relative importance of sanitation control on waste management.

Analytical approaches
The Logit model adopted in this study is for the identification of those variables that best characterized poor waste management control of the households and factors that influence it.   The basic Logit model is given by

$$Pi (Di = 1) = \frac{1}{1+ e^{ii}} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.. (1)$$

Where Ii is a linear combination of the explanatory variable of interest in this study (X_1 to X_{23}). Therefore,

$$Ii = ß_0 + ß_1 X_1 + ß_2 + X_2 +, \dots, + ß_{23} X_{23} \dots\dots\dots\dots\dots\dots\dots ....(2)$$

However,

$$Pi (Di = 0) = 1- Pi (Di = 1) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots........... (3)$$

$$1 - Pi (Di = 1) = \frac{e^{-z}}{1+ e^{-z}} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots \dots......(4)$$

Dividing equation (11), the probability expressions can be transformed to determine the log-odds in favour of being poor or not. This manipulation results into:

$$\frac{Pi (Di = 1)}{[1 - Pi (Di = 1]} = \frac{1}{e^{-Ii}} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots...(5)$$

But

$$\frac{1}{e^{-Ii}} = e^{-Ii}$$

Therefore;

$$\frac{Pi (Di = 1)}{[1 - Pi (Di = 1]} = e^{-Ii} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.................(6)$$

$$In; \frac{[Pi (Di = 1)]}{[1 - Pi (Di = 1)]} = {}^{-Ii} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots......... (7)$$

In the context of equation (7), the left hand side is the odd ratio of the probability of being poor in managed of waste generated to the probability of properly managed waste.

The estimating logarithmic equation is

$$Ii = ß_0 + ß_1 In_1 X_1+ ß_2 In_2 2X_2 +, \dots, + ß_{17} In_{17}X_{17} \dots\dots\dots\dots...........(8)$$

The dummy variable (Y) is Di = 1 poor waste management control and Di = 0, otherwise.

The use of the Logit model in this study borrows from the works of Rodriquez and Smiths, (1994) and Ghazouani and Goaied (2001). The explanatory variables used in the Logit Models and hypothesized as determinants of households poor waste management status are: Poor managed waste generated status (POVSMA), if poor = 1, otherwise = 0, washing hands with soap after toileting (SOTOI) (X_1), Household size (HHSIZE) (X_2) number, Level of education (EDUCAT) (X_3) in years, Age (AGE) (X_4) in years, Occupational experience (X_5) in Naira, Locations and access to waste management services (LAWSE) (X_6), access to potable drinking water (WATER) (X_7), access to toilet facilities (TOIL) (X_8), maintain good drainage (DRAIN) (X_9), sweeping compound regularly (SWEEP) (X_{10}), Dwelling has window/door net (DONET) (X_{11}), housing unit type (HOUSE) (X_{12}), materials of the floor of the house (FLOOR) (X_{13}), number of rooms per person (PERSON) (X_{14}), owns the dwelling residence (OWNDW) (X_{15}), access to extension facilities (ACEXT) (X_{16}) Dummy, if access = 1, otherwise = 0, access to credit facilities (ACCRE) (X_{17}), and Sex (X_{18})

Descriptive statistics of households' socio-economic characteristics
Table 1 shows the percentage distribution of household heads sex and their marital status across the selected cities in

south-western, Nigeria. The table shows that the percentage of male headed households is greater than that of the female headed households. Monogamy is practiced by the majority of the population with Ibadan city practiced the highest monogamy. On other hand, polygamy and loose union/informal association is highest in Oshodi Lagos. This finding tends to confirm Lagos as the most cosmopolitan city in Nigeria

Table 2 shows the percentage distribution of house heads educational status across the cities. The educational status has been divided into six groups – no education, some primary education, completed primary, some secondary, completed secondary and post-secondary. The largest proportion of the population of household heads who did not have education falls in Ogbomoso, while those with higher educational status are in Oshodi in Lagos State. This further confirms Lagos State as sophisticated town, as this could help in understanding and appreciating the need for good sanitation and hygiene.

The overall mean age of 49.87 years with a variability of 33.19 percent. Ogbomoso has the highest mean age of 53 percent and a variability index 32.85 percent. Oshodi in Lagos State has the lowest mean age of 46.7 years with a variability index of 32.90 percent (Table 3).

Table 4 shows the percentage distribution of house heads occupational level across the cities. It shows that 51.75 percent of house heads in Ibadan are largely engaged in agriculture, while Oshodi in Lagos State recorded the lowest house heads that is engaged in agriculture (13.37 percent)

Table 1: Percentage distributions of house heads' sex and marital status across the selected cities in south-western

City	Sex		Total	Marital Status				
	Male	Female		Single	Mono-gamous	Poly-gamous	Informal or loose union	Widowed/ Seperated
Oshodi	7,915	1,538	9,453	6.3830	62.3100	16.4134	4.5630	10.3306
Ibadan	10,316	3,185	13,501	9.3545	59.7921	14.5514	0.2188	16.0832
Ogbomoso	4,188	2,510	6,698	6.1280	46.8906	24.3305	0.1816	22.4694
Total			**29652**					

Source: Author's computation from the 2006 National Core Welfare Indicator Questionnaire (CWIQ) Survey

Table 2: Percentage distributions of house heads' educational status across the selected cities in south-western

City	None	Some primary	Completed primary	Some secondary	Completed secondary	Post secondary
Oshodi	28.5714	1.8237	24.3161	4.2553	27.0517	13.9818
Ibadan	55.9081	2.5164	18.2166	3.7199	12.0350	7.6039
Ogbomoso	43.8947	3.4044	18.1117	4.6300	17.5216	12.4376

Table 3: Descriptive statistics of households' size and household head ages across the selected cities in south-western

City	Age			Household size		
	Mean	Std. Deviation	Coefficient of variation	Mean	Std. Deviation	Coefficient of variation
Oshodi	46.6930	15.3607	32.8972	4.4802	2.2740	50.7567
Ibadan	49.9672	16.8975	33.8172	3.9923	2.4216	60.6568
Ogbomoso	52.9605	17.3974	32.8498	4.0563	2.5787	63.5727

Table 4: Percentage distributions of occupational status across the selected cities in south-western Nigeria.

City	None	Public	Private formal	Private informal	Self agric.	Self others	Jobless	Others
Oshodi	2.1277	17.6292	6.3830	1.2158	13.3739	46.8085	1.2158	11.2462
Ibadan	3.0088	5.1422	1.7505	2.6805	51.7505	28.6652	0.7112	6.2910
Ogbomoso	2.9051	7.2628	2.4058	1.9973	37.5851	36.3595	0.4993	10.9850

Source: Author's computation from the 2006 National Core Welfare Indicator Questionnaire (CWIQ) Survey.

Contributions of Sanitation/Hygiene indicators decomposition to welfare of the households in the selected cities

Table 5 shows the absolute and relative contributions of each of the attributes of sanitation/hygiene to multidimensional poor sanitation/hygiene. The results shows that; material of the floor of the house (0.0089 and 2.37) having problem with supply of drinking water (0.0097, 2.54), main source of drinking water (0.0083, 2.20) type of toilet facility (0.0083, 2.20) and time to nearest health clinic or hospital (0.0095 2.51) are the main attributes influencing the overall multidimensional poor sanitation/hygiene index in selected cities in Nigeria.

The result of the analysis from Table 6 shows that washing hands with soap after toileting, household size, level of education, access to waste management services, access to potable drinking water, access to toilet facilities, maintain good drainage, sweeping compound regularly, dwelling has window/ door net, materials of the floor of the house, number of rooms per person and sex as the factors influencing good sanitation control.

The results indicated that household size; materials of the floor and number of rooms were significant but negative effect on management of waste and good sanitation control. This result suggests that the larger the household size, the poorer the

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sanitation measures of the household becomes. The results also revealed that washing hands with soap after toileting, level of education, access to waste management services, access to potable water; access to toilet; maintain good drainage; sweeping of compound regularly; dwelling has window/door net and sex all had significant and positive effect on good management control and hygiene (Table 6). In other words, the more resources, time allocated to it and commitment to these variables the better the sanitation and hygiene of the households.

On the perception of healthy environment decisions and good sanitation control were determined using an index to determine the number of households who practiced these measures. The following were observed as perception of healthy environment decisions/good sanitation control: Locations and access to waste management services: Access to potable drinking water: Access to toilet facilities:Maintain good drainage: Sweeping compound regularly: Washing hands with soap after toileting

The result from Table 7 presents sanitation control measures as adopted by the household heads and other members of household. The results indicated that control measures were not really practiced by all the households in the selected cities as all the measures recorded a very poor participation. Further decomposition revealed that washing hands with soap after toileting were only practiced in Oshodi (Lagos State) with 72 percent of the households practiced it. On the other hand, Ibadan and Ogbomoso recorded a very low participation (Table 7). All the selected cities recorded a very poor drainage; keeping of the compound regularly; access to potable drinking water and access to toilet facilities.

Table 6 and Table 8 indicated that regression analysis and cross tabulation using the household survey data suggest that perception of healthy environment decisions are strongly affected by educational status, locations and access to waste management authority among others. Households with many members but no access to waste management services are more likely to have multiple wastes littered around. Good access to waste management services facilitates good sanitation control. In addition household head with high and moderate educational status exhibits good sanitation control. Every forms of sanitation control instituted by government for proper waste control and management have not really helped improve sanitation. Part of the problems as the study found out was that population explosion in most of the cities surveyed and lackadaisical on the part of the waste management authority. In addition to not well- designed dump sites and poor waste recycling plants that are non existence.

Table 5: Multidimensional sanitation and hygiene decomposition across the indicators in the selected cities

Indicators / Characteristic	Absolute contribution	Relative contribution
Material of the floor of the house	0.008987	2.367656
Housing unit type	0.002903	0.764666
Number of rooms per person	0.008078	2.128075
Main source of drinking water	0.008342	2.197689
Problems with supply of drinking water	0.009674	2.548624
Water treated before drinking	0.002836	0.747263
Type of toilet facility	0.008334	2.195450
Type of refuse collection	0.006016	1.584861
Maintain good drainage	0.000596	0.156960
Maintain good sanitation	0.002031	0.535192
Dwelling house has window/door net	0.001146	0.301988
Owns the dwelling	0.006544	1.724076
Access to refuse dump or refuse collectors	0.007026	1.850959
Members perceived household to be poor	0.007107	1.872287
Educational level of head of household	0.006009	1.582940
Use bed net to prevent malaria	0.003494	0.920551
Distance to collect drinking water	0.004484	1.181386
Time to nearest health clinic or hospital	0.009543	2.514131

Source: Author's computation from the 2006 National Core Welfare Indicator Questionnaire (CWIQ) Survey

Table 6: Logit Regression Estimates of Poverty Determinants

Variable	Estimate	t-value
Washing hands with soap after toileting, Household size	.090E-02	4.324***
Level of education	-.308E-01	-2.8923**
Age	.4211	3.421***
Occupational experience	-.161E-01	-.3461
Access to waste management services	-.8851	-.2883
Access to potable drinking water	.6272	2.7061**
Access to toilet facilities	.5783	2.7412**
Maintain good drainage	.22E-05	2.1371*
Sweeping compound regularly	933E-06	2.122*
Dwelling has window/door net	. .717	2.762**
Housing unit type	.827E-07	2.1262*
Materials of the floor of the house	. 923E-01	1.4262
Number of rooms per person	-.135E+11	-4.4262***
Owns the dwelling residence	-.5196E-04	-2.5931*
Access to extension facilities	-.1162	-.1201
Access to credit facilities (ACCRE) (X_{17}).	.2364	.3472
Sex	.3681	2.7272**

Source: Computer Printout of Logit Regression Analysis *** = Significant at p<0.001, ** = Significant at p<0.005, * Significant at p<0.001, Log-likelihood function: -198.86, Significance level: .7951 Constant = 0.6292

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Table 7: Percentage of Household heads who practiced sanitation control across the selected cities

Control measures	Oshodi	Ibadan	Ogbomoso
Locations and access to waste management services	0.62	0.21	0.29
Access to potable drinking water	0.31	0.15	0.38
Access to toilet facilities	0.45	0.27	0.51
Maintain good drainage	0.22	0.17	0.32
Sweeping compound regularly	0.35	0.28	0.45
Washing hands with soap after toileting	0.72	0.25	0.15

Source: Computation from CWIQ 2006.

Table 8: Cross tabulation of control measures and some important indicators index that influence good sanitation measures (measure by percentage).

Control measures	Household size	Educational Status	Perception indicators
Locations and access to waste management services	0.24	0.78	0.85
Access to potable drinking water	0.21	0.69	0.91
Access to toilet facilities	0.15	0.82	0.51
Maintain good drainage	0.41	0.77	0.92
Sweeping compound regularly	0.55	0.68	0.65
Washing hands with soap after toileting	0.18	0.72	0.85

Source: Author's calculation.

Results of the Interview with the Indigent Households

The results of the interviews through Focus Group Discussions (FGDs) with the indigent in the selected cities are presented. FGDs covered 320 households which rank 'saving time' as 11th out of 20 reasons, with an importance rating of 3.53 out of 4. Given the need to make several visits per day to a toilet or open defecation site outside the home (especially for women), an assumption was made of 30 minutes saved per person per day, from latrines in the home or compound, giving 182.5 hours per person per year saved. Valuation of time savings due to better access to water and sanitation is recognized as a tricky issue. 60 per cent of the population had access to an improved water source. At the household level, it is the transmission of faecal-oral diseases that is most closely associated with water supply, sanitation and hygiene. Moreover, water-borne and water-washed diseases are responsible for the greatest proportion of the direct-effect water and sanitation-related.

All focus group discussants lacked an understanding of the linkages between hygiene practices and water-related diseases. While the people agreed that excreta are 'bad', none of them made the link between contaminated water and disease. Latrines and hygiene practices were also subject to local taboos and traditions. People discussed, for example, a practice of making children drink the water that the whole family has used for washing their hands. This is said to make children stronger. Some of the discussants felt that entering a latrine was like entering a house – and, indeed one that was smelly and, as such, rather unpleasant to be in. Being in an enclosed space was regarded as an inappropriate environment for defecating.There was a strong notion in all discussions that the decision to invest in and to construct a latrine falls within the male domain. As such, even if a woman wanted a latrine, she would still be dependent on her husband. *'The man takes the decision: he indicates the location, digs the hole and pays for the materials. However, men do not generally see latrines as a priority,'*

Some discussants associated latrines positively with urban life and as 'a white man's affair' which they wanted to imitate. This was particularly the case where members of a family had migrated to the town and invested in a latrine upon their return. In addition, sanitation policies and programmes are decided solely by the government without the input of the local people. As indicated this is why most government policies are not effective. To be effective, as suggested by the people, it must be community demand driven and local people must also be regarded as a stakeholder too in proper sanitation control and management of their waste.

Another important constraint that discussants brought up was the lack of financial resources. Several persons stated that they do not have enough money to buy soap. Others said that they do not have the resources to pay for someone to dig a hole and to buy the necessary materials such as cement or a slab. People also reported that the sandy soil in Ibadan and Ogbomoso made latrine construction difficult, while the discussants in Oshodi had the opposite problem: rocky and granite soils. Because technical expertise is lacking to overcome these constraints, there was a general feeling that it was not worth bothering to try. On the other hand, the discussants also identified a number of factors that encourage the construction of latrines. The general reason given for diarrhoea, for example, was malaria. So, what exactly stands in the way of improved hygiene and sanitation in these selected cities and how can the status quo be improved? At which stage is the sector currently and what are the main barriers and supportive factors for its future development? For this, the study turn to the institutional and policy context that governs the sanitation/environmental sub-sector in Nigeria.

The findings revealed that in the selected areas and Nigeria at large, sanitation and hygiene are still at an infant stage. Although there have been a National environmental days and sanitation strategy since 1984 and a legal framework since 1998, it has remained largely underdeveloped until now. This also goes for hygiene promotion: a hygiene code and policy was adopted only recently, during 1998–2006.In addition to the national sanitation strategy of 1998, the Federal capital territory and some parts

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of Lagos Island have developed their specific sanitation plans in conjunction with a World Bank project restructuring urban water and wastewater management. This means that the city of Federal Capital Territory Abuja and some parts in Lagos are the only areas with a sanitation action plan, structure and financing mechanisms in place. The rural areas and small and medium towns, on the contrary, have been completely neglected until recently with no clear strategy, no budget and no delivery mechanisms to cater for these areas.

Conclusions

In Nigeria, sanitation coverage is very poor. The government estimates that, in rural areas, the percentage of sanitation facilities meeting national standards is below 1 per cent – in other words, virtually non-existent .This study has examined barriers and supporting factors towards improving the sanitation situation in Nigeria. In doing so, particular attention must be paid to increasing latrine coverage and hygiene promotion in rural areas, which relate most closely to Accedes' areas of intervention and which are most relevant for achieving the Millennium Development Goals (MDGs) in Nigeria. The study also found out that most households' lack the financial means for latrine construction and have no access to technical expertise. Latrine adoption is thus a low-priority area. On the other hand, urban sprawl and its influence on rural areas has made people aware of the benefits of latrines, such as privacy and safety, while the growth of rural settlements and disappearance of vegetation cover makes open defecation more problematic. Results of the FGDs revealed that people had taken the initiative to encourage latrine adoption. It thus seems that encouraging the adoption of basic sanitation practices and safe hygiene behaviour as a priority action for poor households is the key. This must however, go with provision of financial and/or technical support. But what can rural dwellers expect from the government in this regard?

While there is agreement on the urgent need to improve water management, there are policy differences regarding how best to do this. Some contend that access to clean drinking water and sanitation is a human right for which governments are obligated to provide services. Others maintain that water is an economic good that should be provided in the most cost-effective way, including market driven schemes and privatization of certain components of water delivery as options. Many governments have pursued a hybrid approach. Countries that have concentrated efforts on improving access to water and sanitation have made progress. In South Africa, for example, 14 million people out of a total population of 42 million lacked access to clean drinking water in 1994. In seven years, South Africa has halved the number of people who lack access to safe water — ahead of schedule. If the present targets are met, South Africa aims to provide everyone with clean drinking water and sanitation by 2008. Nigerians government must learn from these initiatives and take action now.

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