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Research Article

Climate Change Perception and Awareness among Students of Kaduna State University, Nigeria

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ABSTRACT

The need for this study was prompted by the activities of the program "Keep KASU Green". The program encourages the planting of trees on Campus with the intention to create a micro-climate to mitigate the effect of heat on campus. Climate Change Awareness is crucial to promoting sustainable behavior and mitigation strategies. Therefore, the study assessed Climate Change Awareness among Students of Kaduna State University (KASU). In particular, the study assessed students' level of awareness, Sources of Information about climate change, their perception of the Causes, and Mitigation Strategies. Based on the consideration of students' availability at the time of research, a sample size of 200 was purposively determined. Accordingly, simple random sampling was used to administer 200 questionnaires among 400-100 level Students from different Departments and 197 questionnaires were successfully recovered. Descriptive statistics were used in assessing and presenting the findings. The result indicates that about 87.8% of the respondents affirmed that they have basic knowledge of Climate Change, against about 9% who did not have such knowledge. Findings also revealed that a significant level of knowledge of Climate Change amongst Students was obtained mostly from social media (about 38%) and television (about 25%). The students have a fair knowledge of the causes of climate change, including an act of God (31%), human actions (22%), and carbon dioxide emissions (20%). It was determined that the students adequately understood across all levels of the students. However, there is a need to improve the scope of knowledge of Climate Change among the students and people in the immediate environment. Thus, the study recommends the need to integrate climate change education across all academic disciplines, encourage faith and cultural leaders in climate change literacy, and

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1 Introduction

Over the last few decades, climate change has been identified as a major threat to sustainable ecosystems, particularly in tropical sub-Saharan Africa (Bosma & Hein, 2023). According to Pittock (2009), climate change refers to changes in global atmospheric parameters. The effects of climate change could threaten human populations and ecosystem sustainability, thereby presenting challenges to the attainment of some Sustainable Development Goals in the near future (Bojer et al., 2025). Abdussalam (2025), for instance, holds that climate change stands as one of the greatest existential threats of the 21st century, influencing every aspect of life on Earth, ranging from the stability of ecosystems and the productivity of economies to the health and well-being of individuals and communities. The landscape and flora of the environment are primarily determined by climate acting over long time intervals, as climate change is taking place. The change could also bring positive or negative effects on the health and well-being of people in the communities.

These changes are hard to detect and see without numerical measurements, making it difficult for people to believe that Climate Change is taking place. The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, posited an increase in global temperature by 0.6–0.8 °C over the last century, figures significantly higher than what was obtainable over the last millennia (Liu, 2012; Boonwichai, 2019). Understanding human abilities to combat and adapt to global climate change is a persistent social strategy that calls for understanding across all spheres of humanity, making it a critical area of research for social scientists.

The perception of climate and its risk is often reliant upon an individual's view, values, and experience. The personal experiences and observations of the direct impact of climate change have been found to shape the Climate Risk Perception theory, resulting in a varied and multidimensional understanding of climate change in countries and communities around the world. This theory was strengthened by Bulkeley (2014), who observed that Climate change is everywhere; not only are the physical climates of the world everywhere changing, but just as importantly, the ideas of climate change are now found active across the full parade of human activities, institutions, practices, and stories.

The purpose of this research was to assess university students' perception and awareness of climate change, especially among students of Kaduna State University, North-Western Nigeria. In particular, the study seeks to determine the level of students' awareness of climate

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change, their sources of information about climate change, as well as their perception of the effects on education and mitigation strategies. The study aims to provide information to the stakeholders on the effective design of instruments that allow better adaptation and mitigation by society, based on the younger generations' perception of climate change. This, perhaps, is the first study conducted within Kaduna State University. The resultant context should have a meaningful implication for national, regional, and international future climate change policies and university curriculum adaptation to student perception and awareness.

2 Materials and Methods

2.1 Study Area

The current study was conducted in Kaduna State University, which is situated within Kaduna Metropolis. The university is located between latitude Latitudes 10°22′N and 10°40′N and longitudes 07°20′E and 07°28′E (Dogo et al., 2019). The climate is tropical and is characterized by two seasons: the dry season and the wet season. Vegetation is largely a blend between the Guinea and Sudan Savannahs.

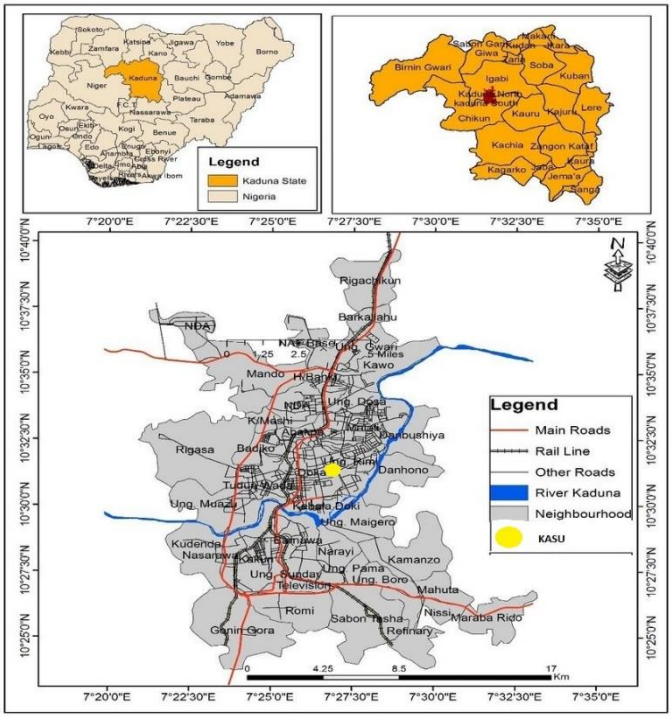

Fig. 1: Kaduna Metropolis
Source: Modified after Abubakar et al. (2019)

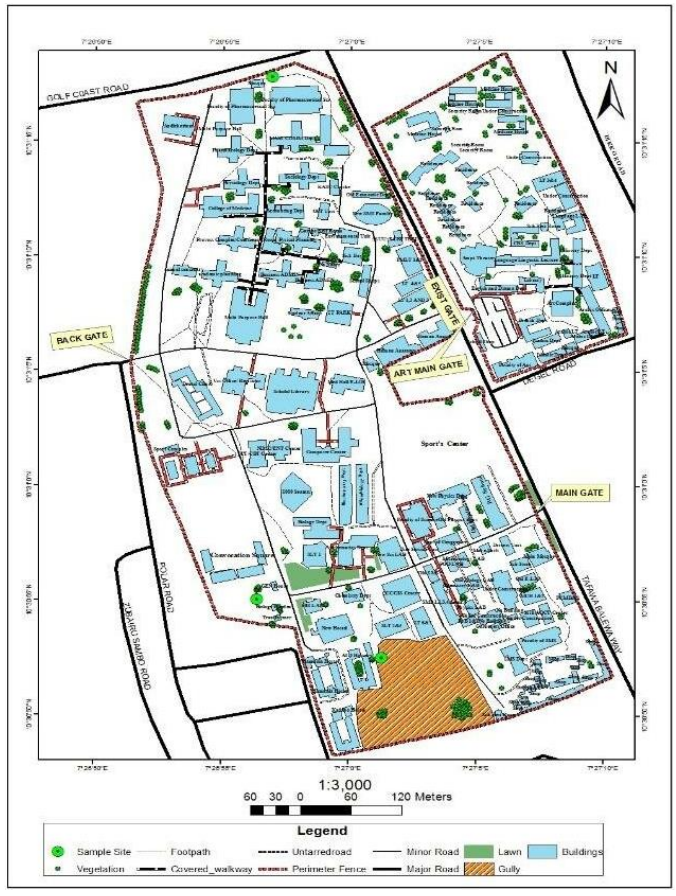

Figure 2: Main campus of Kaduna State University
Source: Google Open Street Map, 2018

2.2 Data Sources

In this study, 400-level Geography students are used to form a "Knowledge benchmark" group that is a reference point for comparing awareness levels across other fields of academic studies. This is based on the assumption that the climate change concept is widely taught to such students throughout their studies as Geographers. Also, this particular study includes students of Economics, 300 level, to strategically mediate as a "control-group", that is, students advanced in study but whose discipline does not directly teach the themes of climate issues. This strategy aims to study to see whether exposure to climate content or general university education level plays a bigger role in awareness. The essence is to gain a comparative analytical depth for the study. In addition, 200 Level Political Science students are also strategically used because climate change is a governance policy and societal issue, not just an environmental one. Political science connects awareness with public policy, understanding governance response, and the human dimension of the climate debate, which is relevant to the study. Students of Education, made up of Biology, Physics, and Chemistry (100 levels) provides varied insight reinforcement into baseline awareness of climate change. It is expected that as incoming students, they can share their experiences of what they know before deeper

exposure to university curricula. This strategy gives the study a developmental perspective that is, from naïve awareness (freshers) to informed awareness (Geography 400 level).

The instrument for data collection was a structured questionnaire that had two sections. The first section collected data on the demography of students, while the other pertained to their knowledge and perception of climate change. A sample size of 200 was purposively determined on the basis of ease of access. Accordingly, simple random sampling was used to administer 200 questionnaires among 400-100 level Students from different Departments and 197 questionnaires were successfully recovered. The students were selected across four (4) departments covering levels 100 – 400. Each level was issued 50 copies of the research questionnaire. The students were randomly selected and given the Questionnaire with their consent.

2.3 Data Analysis

The validity and reliability of the research instruments were tested to ensure the accuracy and consistency of the data collection process. To measure the reliability of the instruments, a pilot study was conducted where a questionnaire was administered to 20 (10% of the sample size) randomly selected respondents to respond to the prompts in the questionnaire. The questions within the key sections of the questionnaire were tested for reliability using the Cronbach's Alpha coefficient. This is a widely used method for checking the degree of consistency and accuracy of items in the questionnaire (Tavakol & Dennick, 2011). The Cronbach Alpha coefficient ranges from 0 to 1, and a value ≥ 0.7 is considered acceptable (Tavakol & Dennick, 2011). SPSS v23 was used to compute the said coefficient. The Cronbach Alpha reliability test returned a value greater than 0.75 for all the sections assessed, thus falling within the acceptable range for alpha.

3 Results and Discussion

Table 1 shows the frequency of responses collected from students based on their departments. Although a total of 200 questionnaires were given, 197 were returned, the shortfall of three being from students of the department of Political Science. The analysis synthesizes respondents' self-reported knowledge of climate change, principal sources of information, perception, and mitigation strategies. The data collected reveals both awareness and perception gaps that can shape the future of climate education and advocacy in Nigeria.

Table 1: Departmental Response

Departmental response	Frequency	Percent
Economic	50	25.4
Geography	50	25.4
Political science	47	23.9
Chemistry education	19	9.6
Biology Education	17	8.6
Physics Education	14	7.1
Total	**197**	**100%**

The study sampled 200 students across Departments and Levels by representation given as: Economics (25.4%), Geography (25.4%), Political Science (23.9%), Chemistry Education (9.6%), Biology Education (8.6%), Physics Education (7.1%). The cross- disciplinary mix demonstrates the researcher's intentional effort to assess climate change literacy across both environmentally aligned and non-environmental fields of academics as an innovative design. Students from all Levels (100 – 400) were represented fairly and evenly, indicating that findings reflect both early and advanced exposure to higher education.

Table 2: Knowledge of Climate Change

Response	Frequency	Percentage
Yes	173	87.8
No	18	9.1
Neutral	6	3.1
Total	**197**	**100**

An impressive 87.8% of the respondents affirmed they have basic knowledge of climate change, only 9.1% denied having such knowledge, while 3.1% have no response. The high level of awareness suggests that climate change awareness is no longer confined to Geography classrooms only, but to the entire mainstream academic consciousness. This aligns with findings from other studies within the region, including Ikpe et al. (2022), who established about 95% knowledge of climate change among farmers in Kaduna, and Moshood et al. (2024), who established a 78% knowledge level among forestry students in Nigeria.

Table 3: Sources of Information

Sources	Frequency	Percentage
Radio	31	15.7
Television	50	25.4
School	22	11.2
Newspaper	13	6.6
Social media	75	38.1
Others	6	3.0
Total	**197**	**100**

From Table 3, social media is the dominant channel of information on climate change (38.1%), followed by television (25.4%) and radio (15.7%). A lower number of students claimed they obtained information about climate change from school (11.2%), while newspapers and others are represented by 6.6% and 3%, respectively. The use of social media and the internet shows that young people are increasingly digitally informed. Moshood et al. (2024) also established that among students studying forestry in Nigeria, about 72% claimed they got to know about climate change from social media. Social media and the internet are shaping environmental awareness more than formal instruction, revealing both an opportunity and a risk. While online platforms can quickly spread information, they can also amplify misinformation by using it as a credible education tool rather than coding it to unverified voices. The findings of this study are at variance with Odjugo (2012), whose analysis of the source of information tool, on climate change in Sokoto, was predominantly from television, followed by radio. It can be deduced that Sokoto is more of a homogenous cultural setting where people watch and listen to the radio more often than the KASU environment, which is cosmopolitan and diverse in cultures.

Table 4 shows how students associate climate change with multiple environmental phenomena as follows. From the table, we can deduce that the perception of students on climate change indicates that an overwhelming percentage of almost 50% agreed that climate change is principally caused by global warming, which includes increasing heat and increasing rainfall, vis-à-vis other factors.

Table 4: Perception /Understanding of Climate Change

Perception	Frequency	Percent
Drying up of wetlands	26	13.2
Global warming	98	49.7
Increasing flood	44	22.3
Changes in any aspect of the Earth	20	10.2
Poor crop yield	9	4.6
Total	**197**	**100**

This could be attributed to the intense heat of the climate during February to early May in the study area (KASU) and the environs, where the temperature often rises to an alarming 45°C.

Abdulssalam (2025) noted that Nigeria's diverse geography, ranging from the arid Sahel in the North to the humid tropical rainforest in the South, makes the country particularly vulnerable to a wide range of climate-related impacts. Some students (about 22.3%) reported increasing floods as often seen in the river Kaduna during the peak of the rainy season, which is another sign of climate change. On the other hand, heavy rain at different localities can lead to wide spread flood, which can lead to loss of property and life. This fact is supported by the NiMet report of 2020, which states that in Nigeria, at least 40 people lost their lives and more than 2million tons of rice were washed away as a result of the flood, which worsened the country's food insufficiency and led to a food price hike in 2020. Shortage of food has a negative effect on people's livelihood and their income.

In addition, a lot of people are often displaced and rendered homeless due to floods. This can also be anchored on the fact that students on a yearly basis witness the surge of flood in the River Kaduna, which often affects houses along the river plain. About drying up of wetlands, about (13.2%) of the students, through observation, are of the view that such a phenomenon is an index of negative climate change. For changes in any aspect of the earth (10.2%), the respondents understood that as a form of climate change, which introduces prolonged drought and deforestation. Relatively, (4.6%) of the respondents cited poor crop yield as an embodiment of negative climate change. Suffice it to say that prolonged drought and desertification have drastically reduced agricultural land use, endangered food security, and forced pastoralists to migrate.

Table 5: Causes of Climate Change.

Causes	Frequency	Percent
Carbon-dioxide (CO2) Emission	40	20.3
Natural phenomena (God's will)	61	31.0
Land use changes	22	11.2
Human activities	45	22.8
Deforestation	29	14.7
Total	**197**	**100**

The majority of the students represented by (31%) of this analysis attributed the cause of climate change to natural phenomena (God's will). This illustrates a deep cultural and religious perception, as the will of God is believed to oversee everything that is associated with the universe and its inhabitants. Many students are of the view that climate change is caused by God, who is considered the alpha and omega of the universe. The effect of climate change, whether positive or negative, is often seen as divine punishment meted out on the world for the numerous shortcomings committed by humans against their creator or God.

With respect to Carbon dioxide (CO_2) Emission (20.3%), the respondents recognize carbon emission as a major factor in negative climate change due to vehicular

emission, industrial gas flaring, and the phenomenon of bush burning, which all contribute to global warming, as people often experience harsh weather conditions in the hot season. In addition, the respondents also affirmed anthropogenic activities as contributing to negative climate change, as well as land use changes, as 11.2% of the respondents attribute climate change to include urbanization that often creates hot spots due to congestion of human and traffic flow. Arable lands are cleared for agricultural activities, whereby inducing soil, wind, and water erosion. Abawua and Akumaga (2015) opined that the cumulative effect of land clearance by bush-burning accelerates soil erosion and the concentration of carbon dioxide emissions in the atmosphere, which causes negative climate change. A low percentage of respondents (14.7%) claimed deforestation as the cause of climate change.

Deforestation leads to habitat loss of many plant and animal species, making them become endangered and driving them towards extinction. In addition, trees absorb carbon-dioxide and when cut, this carbon is released, contributing to global warming. While trees help regulate the water cycle, their removal can lead to changes in river flow and an increase in flood risk. Deforestation can displace communities that rely on the forest and hunting for their livelihood, as well as the use of medicinal herbs. Otiwa (2015) conducted a study that supports this particular observation by showing that 60% respondents of Afaka Forest Reserve along the Birnin-Gwari axis rely on products from the forest for their livelihood, ranging from hunting, employment, economic tree plants, seedlings, and medicinal herbs for the treatment of various ailments.

Furthermore, Goma (2022) stated that deforestation accounts for 20% of the world's Carbon emission. Deforestation makes such a huge contribution to carbon emission because trees absorb Co_2 as they grow and produce oxygen (O_2) if the trees are cut down without replacement only few trees will be left to absorb CO_2 this would result in the building up of CO_2 in the atmosphere Furthermore, Laah (2014) opined that the recent demands for firewood and charcoal due to high cost of kerosene and gas have also affected soil fertility….."It has contributed to the problem of land degradation, soil erosion, and drought that endanger the livestock population. To check the effect of deforestation on environmental sustainability, there is a need for concerted efforts to plant new trees and protect the old ones (The Dalai Lama, 1991).

In addition, Laah (2014) stressed that the International Campaign to have one billion trees planted globally recorded magnificent success. For instance, in Uttar Pradesh, India, 600,000 people, including school Children planted 10.5 million trees in one day in July 2007. In line with the above action, the Green KASU Students Program planted over 1000 trees in the university premises in 2024.

Table 6: Effects of Climate Change on Education

Effect	Frequency	Percent
Family migration	34	17.3
Disruption of learning activities	102	51.8
Negative impact on family finance/income	18	9.1
Increase student non-attendance	40	20.3
Malnutrition and health related issue	3	1.5
Total	**197**	**100**

The effects of climate change are already manifesting and increasing extreme climatic events, particularly storms, floods, and rising temperatures, as well as altered climatic weather regimes. The effects are creating declining productivity of rain-fed agriculture and relocation of population with all its consequences, as given by the Kaduna State Ministry of Environment and Natural Resources (2019).

The most cited effect of climate change was disruption of learning activities (51.8%) followed by an increase student's nonattendance (20.3%). These responses reveal that students perceive climate change as a social and educational crisis, not merely an environmental one. When rainfall patterns, floods, or food insecurity interfere with attendance and family finances, learning outcomes suffer. This aligns with global research showing that climate vulnerability directly affects educational access and performance, particularly in developing nations.

Furthermore, extreme weather events like floods, drought, and heat waves can damage school gadgets and infrastructure, leading to closure and disruption of learning. A mere (9.1%) of the respondents affirmed the effect of climate change on family finance/income. For instance, when a family member is sick, a substantial amount of the family income is diverted for the treatment of the unwell person, which could affect the fulfillment of other family needs. In addition, Climate change can have devastating effects on family income, especially in Nigeria, where many people rely on agriculture for their livelihood. Crop failure and reduced yield reduce the income of farmers, while climate stress can lead to animal diseases, death, and reduced pastoralists' income, which will invariably affect the consistency of education programs. About 17% of the respondents believe that family migration affects learning. Students perceive tangible negative effects on education, notably as

disruption of learning and absenteeism. Other negative effects of migration include language barriers, as non-native speakers might struggle with language proficiency, thereby affecting their academic performance.

In addition, migrant students may face cultural and social adjustment, potentially leading to isolation or low self-esteem. While schools may need to adapt a flexible curriculum to accommodate diverse students' needs which can be resource-intensive. Abdulssalam (2025) corroborated that the displacement of communities due to climate change will also strain social services, including healthcare, education, and housing. Even though an insignificant percentage (1.5%) asserted that malnutrition and health-related issues harm education, the assertion is still valuable. Malnutrition, especially in early childhood, can affect brain development, leading to lower IQ, poor memory, and reduced problem-solving skills, making learning tough. To solve this problem of malnutrition, the Federal Government and the Kaduna State Government introduced the school feeding program for early child cognitive development.

Furthermore, people lost their lives to an outbreak of cerebral meningitis, and a prolonged heat wave has been linked to the cerebral meningitis outbreak. NiMet (2017) predicted that the warmer than normal temperature conditions in April in parts of the country may lead to an increase in incidents of heat-related diseases such as cerebrospinal meningitis (CSM), heat stroke, and heat rashes. In line with this, NiMet (2017) also reported that a total of 269 people lost their lives to an outbreak of cerebral meningitis. Attempts at climate change education/awareness have been largely inadequate; thus, many people are not aware of their role in environmental management.

Furthermore, Laah (2014) maintained that there is a debate between those who insist that the activities of man are responsible for the gradual warming of the Earth's surface and those who either insist that there is such a thing as warming or see it as a natural occurrence. However, it is obvious from what has been documented that the planet's temperature has risen significantly in the last century. In addition, floods and warm temperatures usually increase the spread of diseases and infections such as malaria and pneumonia. Health issues related to malnutrition, like anemia and other infections, can cause frequent absence, impacting learning continuity. Thus, the cost of medication can also affect family income to provide basic needs, as the income is channeled towards treating the life of the sick person.

This is further supported by Abdulssalam (2025) that Climate change poses significant risks to public health in Nigeria, particularly through the increased spread of infectious diseases and worsening of education continuity by absenteeism. This has been closely observed by Isaksen and Lauer (2002). They observe that if the father is ill, there is a likelihood of economic problems, a lower standard of living that can affect the cost of children's education, and could lead to a child's withdrawal from school due to stress in the family finance/income. Transport- wise, prolonged dust and haze during the months of harmattan have an adverse effect on the Aviation industry, where horizontal visibility can be reduced to cause cancellation or delay of flights. Heavy rainfall can also affect road transport as floods could submerge roads, in some instances, causing bridge collapse. This study shows climate change as a present social issue that undermines education continuity, not merely an environmental abstraction.

Table 7: Mitigation Strategies of Climate Change

Strategies	Frequency	Percentage
Renewable energy	50	25.4
Reducing CO_2 emission	103	52.3
Slow population growth	25	12.7
Global cooperation	19	9.6
Total	**197**	**100**

The students, especially in KASU, support reducing carbon dioxide emissions (52.3%), renewable energy (25.4%), a slowdown in population control (12.7%), and global cooperation (9.6%) as key solutions to climate change. This reflects a strong inclination towards proactive and solution-oriented thinking among students. Findings suggest that climate education should go beyond global rhetoric to emphasize individual behavior change, sustainable lifestyle, and local action by linking students' habits to global outcomes.

4 Conclusion

The analysis in this study demonstrates that Kaduna State University Students possess a commendable level of climate change awareness and understanding, primarily driven by modern communication channels and academic exposure. However, there remains a need for structured institutional reinforcement through policy, curriculum, and campus-based environmental initiatives. With targeted education practices and participation, the students of KASU could become pivotal agents in advancing Nigeria's climate resilience and sustainable goals.

i. The findings strongly recommend that there is a need to integrate climate change education across all academic disciplines and to introduce Environmental Literacy as a General Studies Course in all Nigerian Universities.

ii. Through social media and the internet launched strategic advocacy for positive climate literacy should be in the spaces where students already get their information, e.g., TikTok, X, and so on.
iii. Engage faith and cultural leaders in climate literacy, since many people still interpret climate change as divine. KASU should partner with religious institutions to frame environmental care discourse as Godly stewardship.
iv. KASU and all Nigerian Universities should promote research and innovation by encouraging students to adopt research and innovation strategies on climate change at all levels of education.
v. KASU should establish a climate change awareness club, which could prompt similar development in tertiary institutions in Kaduna state and the nation at large. This will support climate change critical awareness starting from the neighborhoods of the institution, for positive, collaborative action that will secure our communities from all climate and environmental threats and insecurities.

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