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ASSESSING THE MANAGEMENT OF DAMPNESS IN RESIDENTIAL BUILDING AND THE SURROUNDING HOUSEHOLD AT AGO ADULOJU, ADO EKITI

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Abstract: *This research look into the assessing the management of dampness in residential building and the surrounding household at Ago Aduloju, Ado Ekiti, Nigeria. The majority of buildings experience maintenance issues that eventually lead to varying degrees of deteriorations and faults due to moisture movements. This study was conducted with the use of a descriptive research design and the data were collected and SPSS was used for the analysis. The causes of dampness in a house and domestic environment revealed that poor ventilation ranked first with RSI value of 0.642 (i.e. 64.20 % significance), leakages through foundations ranked second with RSI value of 0.632 (i.e. 63.20% significance), and penetration of rain water through unprotected tops of walls, and parapet ranked third with RSI value of 0.62 (i.e. 62 % significance). While Splashing of rainwater ranked tenth with RSI value of 0.544 (i.e. 54.40 % significance), plumbing issue ranked eleventh with RSI value of 0. 52 (i.e. 52 % significance), and Deteriorate carpets, skirting boards, dado rails and furniture ranked least with RSI value of 0.476 (i.e. 47.60 % significance). Moisture may enter the building through the walls, floors, or roof due to poor structural design, poor craftsmanship, the use of faulty materials, or a combination of these factors. Dampness is a major cause of issues for buildings, and it should be avoided by recommending the use of damp proof courses, or DPCs.*

Keyword: *assessment, dampness, deterioration,, residential building, surrounding household, ventilation*

I. INTRODUCTION

Dampness is a serious issue for many house owners.. Not only does it lead to structural problems with structures, but it also affects one's health and makes a house quite uncomfortable to live in. Unfortunately, a lot of us may eventually suffer moisture in our houses. Although there are three primary types of damp, there are many other possible reasons. There are three different forms of dampness: rising, condensation, and penetrating. Each has its own causes, effects, and prevention. Research goal is to address the causes, warning indicators, and removal method so that the house can be free of moisture. Penetrating damp is caused by water leaking through the walls.

Rising damp is caused by water from the ground moving up and rising into the house as a result of capillary action. Condensation damp occurs due to a lack of ventilation, cold surfaces, and lack of central heating. A building delivered to the satisfaction of the client is one that is accepted as being of high standard and built using good machineries. There can be no failure of a building without a prior failure of some building components. The technology of construction can never guarantee complete elimination of some degree of failure because of the fact that structures settle down, however slightly, on completion, as a result of consolidation of subsoil imposed by the weight of the structure. Most buildings in Nigeria are faced with

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maintenance challenges resulting in decreasing and ultimate defects of various levels. While the BS 3811(1974) defined building maintenance as work done to keep a building in, or restore it to its initial state, or to a currently acceptable standard. To retain implies that defects are prevented from developing by carrying out work in anticipation of failure. To restore means that minor defects had already occurred before they are corrected. The acceptable standard must not be less than that necessary to meet them and the acceptable standard must sustain the utility and value of the facility. This study will therefore investigate the assessment for controlling of dampness in an existing building in Nigeria.

Dampness in building can be caused by poor design, faulty construction, or the use of substandard materials. Dampness not only shorten a building's lifespan, but it also contaminates crucial building components during construction. The word "water proofing" refers to the process of preventing water leaks from roofs, whereas "damp proofing" refers to the process of keeping the walls, floors, and basement dry.

II. LITERATURE REVIEW

Dampness is one of the most prevalent defects in buildings. It can affect a wide range of constructions and materials, such as steel, timber, concrete, and masonry. Dampness should be avoided by using DPCs (Damp Proof Courses) as it can cause a lot of issues for structures. This paper offers some extremely useful information about the causes, mechanisms, and preventative methods of moisture buildup. Buildings have an expected lifetime of 60 to over 100 years, during which they offer shelter from the weather to human beings, animals and properties. Weather and its variations cause degradation of building materials and structures, climate change has a substantial impact on building materials, despite the fact that few governments, particularly those in developing nations, have given considerable attention (Athauda, 2023). When designing a sustainable building, it is important to take into consideration the location, natural shading, shelter (from storms, etc.) and structural materials (Cukierski, 1999). This is due to the fact that various factors, including ground water, sun radiation, wind, precipitation, and ambient air temperature and humidity, influence diverse processes of structure deterioration. When there are additional design issues with an existing building, serious environmental concerns may also occur.

Moisture difficulties are a prevalent issue that might arise from these circumstances. Rising dampness, a sort of wetness that happens when ground water is carried up through a masonry wall or a concrete floor slab, is typical of these moisture issues. Moisture can raise a building's humidity level and harm shelves (Cukierski, 1999).Dampness is one of the most common issues with both historic and contemporary building types (Hetreed, 2008; Karoglou et al., 2007; Burkinshaw and Parrett, 2004). In general, moisture results in high heating energy consumption, damage to building exterior and interior walls, and an uncomfortable interior atmosphere for residents (Karouglou et al., 2007). One of the most important aspects of sustainable building renovation is the restoration of building envelopes that have moisture difficulties (Abu Bakar, and Mbamali**,** 2011).

Building moisture transfer is a complicated problem that has been in the news for many years. According to Trotman et al. (2004), moisture in buildings can lead to a variety of problems, including internal and external wall surface discoloration, fungal assault on timber, degradation and fracture of mortar joints, and damage to brickwork and block work. Mould grows more readily on damp surfaces, and high relative humidity promotes the growth of mould and mites, both of which are linked to health problems (World Health Organisation, WHO, 2009). The

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presence of mould or damp stains on decorations can have a negative impact on the mental well-being of residents, leading to feelings of anxiety and sadness (Marco, A. Ortiz, Stanley, R. Kurvers, Philomena M. Bluyssen (2017); Nicol, 2006). Dampness in all its forms has taken alarming proportions as the most commonly reported cause of building deterioration; countries such as Nigeria, the United Kingdom, the United States of America, Australia, Denmark, Canada, Japan, Estonia, Iceland, Norway, Sweden, Taiwan, etc. have documented the magnitude of the issue (Nemmadi, 2019); Mudarri and Fisk, 2007).

Dampness control is essential for every building to operate as intended. Efficient management of dampness is crucial in safeguarding the well-being of building inhabitants and preventing physical or chemical harm to the structure's mechanical systems and contents. Still, a lot of people believe that moisture issues in buildings are unavoidable since they occur so frequently. Dampness can be explained as penetrating water through walls and other structural components of a structure is known as dampness (Halim et al., 2012). Dampness is an excessive amount of moisture in building materials and components that leads in unfavourable motions or deterioration and unsuitable internal environmental conditions (Briffet, 1994). Chris Scott (2024) reported that dampness is the total quantity of moisture content, potential moisture content, hygroscopic moisture content, equilibrium moisture content, and capillary moisture content that is present in a material. According to Halim et al. (2012), Fincrete (2022) and Trotman (2004), dampness is the most common and significant issue in structures, accounting for over half of all recorded construction failures.

Hollis (2000) asserts that the majority of structure damage is intrinsically tied to wetness. One of the issues related to moisture is the presence of a water source near a structure. According to Halim et al. (2012), these issues manifest as many symptoms, such as grimy areas on the structure, biological plant growth such as mosses, fungi, and creeping plants, as well as paint flaking and blistering. Understanding moisture and its effects on structures is essential for accurate diagnosis and recommendation of appropriate corrective measures. Any dampness study's main goal is to locate the primary source of moisture so that corrective action may be suggested (Halim et al., 2012). Hollis (2000) categorized the sources of moisture as pipe leaks, rising dampness, penetrating dampness, and condensation.

Dampness can be categorized as air moisture condensation, penetrating dampness, internal plumbing leaks, below-ground moisture, or building-specific causes, according to Burkinshaw and Parrett (2004). According to Halim and Halim (2010), Ahmed and Rahman (2010), Riley and Cotgrave (2005), Trotman et al. (2004), and Seeley, I. H. (1994), rising dampness is caused by the capillary suction of moisture from the ground into porous masonry building materials like stone, brick, blocks, earth and mortar. More can be pulled from below when the moisture evaporation occurs on both the interior and exterior faces of the wall. According to Halim and Halim (2010), Rahman and Ahmed (2010), Trotman et al. (2004), Riley and Cotgrave (2005), and other sources, the typical range for rising wetness is between 0.5 and 1.5 metres above ground level. If the rising moisture is extreme, it can cause blistering paint and loss of plaster, as well as a stain on wall paper and other interior finishes resembling high tide. When combined with excessive humidity, damp walls promote the growth of mould, which can cause health issues for residents (Ahmed and Rahman, 2010). Three conditions must be met simultaneously for water to enter a building enclosure: it must be present; it must also have an opening for water to enter; and there must be a physical force to move the water (Beall,

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2000). Rain, snowmelt, and soil moisture are all forms of water. Water penetration into structures is influenced by a number of factors, including gravity, air currents, capillary suction, surface tension, kinetic energy, air pressure, and hydrostatic pressure (Beall, 2000).

The presence of moisture in a building is known as dampness. The moisture may come from a variety of sources and take the form of liquid water or water vapour. Numerous things can contribute to dampness, such as: Water seeping through gaps in foundation walls or floors; Moisture trapped under carpets and padding; Mould growth and corrosion caused by moisture trapped between layers of plaster; leakage of water via plumbing pipes (such as copper pipes) that are not adequately sealed off. One of the most frequent structural flaws in buildings is dampness. It may result in both health issues for building inhabitants and structural harm to the structure.

III. METHODOLOGY

The goal of the study, which focused on Ago Aduloju and Ado Ekiti of the South-West Nigeria, was to assess how well an existing structure was controlling its moisture. A mixed method approach was used to gather the opinions of construction experts on the causes, impacts, and solutions of assessing an existing building's moisture control in order to accomplish the goal. A survey instrument was created to gather feedback from building industry experts engaged in construction projects as well as residents of Ago Aduloju, Ado Ekiti. The questionnaires was intended for professionals with at least ten years of relevant experience working on building projects with many stakeholders, including those in the fields of architecture, building, quantity surveying, engineering, and other related fields.

The survey respondents were asked to rate the control of dampness of an existing building based on a five-point Likert scale in which 1 = strongly disagree and 5 = strongly agree. Prior to the respondents' responses being used for analysis, the questionnaire also requested background information from them to confirm that they had the necessary education and years of professional experience to participate in the survey. To ensure that the responders had worked on certain projects through to completion and could apply their practical understanding of moisture management in an existing building, a minimum of ten years of relevant professional experience was required. The population of this study consists of professionals working on Building projects and residents living in Ado Ekiti, Nigeria.

IV. DATA ANALYSIS AND RESULTS

The data were presented using tables for clarification and better interpretation. The analysis tools included both descriptive and inferential statistics.

A. Respondents Profile

Table 1: Sex of the respondents that answered the questionnaires

Sex	Frequency	Percentage
Male	66	66.00
Female	34	34.00
Total	100	100.00

Table 1 showed the gender of the respondents. It showed that ninety two percent (66%) are male, and eight percent (34%) are female. The result shows the representation of genders in the construction industry in the study area.

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Table 2: Length of service of the respondents that answered the questionnaires

Years	Midpoint (x)	Frequency (f)	Fx	Percentage
1-5	7	22	154	10.85
6-10	9	19	171	12.05
11-15	14	18	252	17.76
16-20	19	20	380	26.78
above 21	22	21	462	32. 56
Total		**100**	**1419**	**100.00**

Mean = ∑fx/∑f= 1419/100 = 14.19

Table 2 shows the respondents mean year of experience estimated at approximately thirteen years (14 years). With this average working experience of thirteen years, respondents are deemed experienced enough to supply reliable data for the research.

Table 3: Professional qualification of the respondents that answered the questionnaires

Educational Qualification	Frequency	Percentage (%)
NIOB	40	40.00
NIQS	18	18.00
NIA	16	16.00
NSE	14	14.00
Others	12	12.00
Total	**100**	**100.00**

Table 3 represents the educational qualification obtained by the respondents. 42.23% is registered with NIOB, while 17.77% is registered with NIQS, 15.56% is registered with NIA, 13.33% with NSE and 11.11% with other professional bodies. The result shows that all respondents possess registration of their various professional bodies in Nigeria and adequate professional training to supply reliable data for the study.

Table 4: Causes of dampness in a house at Ago Aduloju, Ado Ekiti, Nigeria

S/N	FACTORS	1	2	3	4	5	% Rank	Rank
1	Poor ventilation	20	16	17	17	30	64.20	1
2	Excessive moisture	26	15	18	21	20	58.80	6
3	Inadequate DPC	21	20	15	34	10	58.40	7
4	Plumbing issue	25	23	26	19	7	52.00	11
5	Building faults	22	20	15	15	28	61.40	4
6	Inadequate gutter	20	23	19	20	18	54.60	9
7	Increase ground water level	21	28	16	26	9	54.80	8
8	Leakages through foundation	20	21	12	17	30	63.20	2
9	Deteriorate carpets, skirting boards, dado rails and furniture	20	23	24	15	8	47.60	12
10	Poor heated home	21	20	18	21	20	59.80	5
11	Splashing of rainwater	21	10	15	34	10	54.40	10
12	Penetration of rain water through unprotected tops of walls, and parapet	25	13	16	19	27	62.00	3

Table 4 above showed the Relative Significance Index (RSI) of the level of factors that is causing dampness in a house at Ago Aduloju, Ado Ekiti, Nigeria. It revealed that poor ventilation ranked first with RSI value of 0.642 (i.e. 64.20 % significance), leakages through foundations ranked second with RSI value of 0.632 (i.e. 63.20% significance), and penetration of rain water through unprotected tops of walls, and parapet ranked third with

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RSI value of 0.62 (i.e. 62 % significance). While Splashing of rainwater ranked tenth with RSI value of 0.544 (i.e. 54.40 % significance), plumbing issue ranked eleventh with RSI value of 0. 52 (i.e. 52 % significance), and Deteriorate carpets, skirting boards, dado rails and furniture ranked least with RSI value of 0.476 (i.e. 47.60 % significance). The result also showed that all the factors are significant with the least factor having 47.60 (0.476) percent significance.

Table 5: Effects of dampness in a house at Ago Aduloju, Ado Ekiti, Nigeria.

S/N	FACTORS	1	2	3	4	5	% Rank	Rank
1	Window and door frame routing	22	10	15	25	28	63.80	4
2	Corrosion in metallic fittings and reinforcement bars.	10	23	29	20	18	62.90	5
3	Bleaching and blistering of paints.	11	28	26	26	9	58.40	9
4	Peeling off, removal of plaster tiles and terrazzo works	11	20	25	16	28	66.00	1
5	Walls and flooring with stains and spots	19	23	20	20	18	60.70	6
6	Worn-out furniture, dado rails, skirting boards, and carpets	21	28	16	26	9	58.70	8
7	Deteriorate electrical systems	20	23	24	15	18	52.90	10
8	Efflorescence	20	11	12	17	30	65.80	2
9	Issues relating to occupants' health	21	20	18	22	19	64.20	3
10	Reduce the building lifespan	21	10	15	34	20	60.40	7

Table 5 above showed the Relative Significance Index (RSI) of the level of factors that is affecting control of dampness in a house at Ago Aduloju, Ado Ekiti, Nigeria. It revealed that Peeling off, removal of plaster tiles and terrazzo works ranked first with RSI value of 0.66 (i.e. 66% significance), efflorescence ranked second with RSI value of 0.658 (i.e. 65.80 % significance), and issues relating to occupants' health ranked third with RSI value of 0.642 (i.e. 64.20 % significance). While deteriorate electrical systems ranked least with RSI value of 0. 529 (i.e. 52.90 % significance). The result also showed that all the factors are significant with the least factor having 0. 529 (i.e. 52.90 % significance).

Table 6: Solutions of dampness in a house at Ago Aduloju, Ado Ekiti, Nigeria

S/N	FACTORS	1	2	3	4	5	% Rank	Rank
1	Repair and clean damaged gutters	20	11	22	17	30	65.20	1
2	Replacing and repairing damaged or absent roof tiles	11	20	28	21	20	59.80	7
3	Fill up the gaps around door frames, window frames, and wall frames	21	10	25	34	10	60.40	6
4	Close off any leaky pipes	25	13	26	19	17	58.00	8
5	Swap out porous brickwork or apply a coating of materials that repel water	22	10	25	15	28	63.40	3
6	Heating regulation	20	23	19	20	18	54.60	10
7	Provision of adequate drainage	21	28	16	26	9	54.80	9
8	Good design and construction	22	20	15	15	28	61.40	5
9	Damp proofing membrane	10	23	24	25	18	63.60	2
10	Surface treatment	20	28	16	26	10	55.60	11
11	Cavity wall construction	20	23	19	20	18	47.20	12
12	Clearing windows and affected areas by wiping cloth	20	21	12	17	30	63.20	4

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Table 6 above showed the Relative Significance Index (RSI) of the level of probable solutions to the control of dampness in a house at Ago Aduloju, Ado Ekiti, Nigeria. It revealed that Repair and clean damaged gutters ranked first with RSI value of 0.652 (i.e. 65.20% significance), damp proofing membrane ranked second with RSI value of 0. 636 (i.e. 63.60% significance), and swap out porous brickwork or apply a coating of materials that repel water ranked third with RSI value of 0.634 (i.e. 63.40 % significance). While cavity wall construction ranked least with RSI value of 0. 472 (i.e. 47.20 % significance). The result also showed that all the factors are significant with the least factor having 0. 472 (i.e. 47.20 % significance).

V. CONCLUSION

One of the main sources of dampness is moisture absorption by the building materials. Due to the granular structure of the materials, moisture can easily enter the voids and migrate in various directions with the help of capillary action. Therefore, moisture may enter the building through the walls, floors, or roof due to poor structural design, poor craftsmanship, the use of faulty materials, or a combination of these factors.

VI. RECOMMENDATION

Dampness is a major cause of issues for buildings, and it should be avoided by using damp proof courses, or DPCs. By forming a barrier between the interior walls, floors, and roof and the outside world, these are intended to stop rainwater from entering your house or place of business. This keeps water from seeping through joints or cracks in materials like mortar, wooden external wall components, etc., increasing their resistance to moisture penetration, which, if left untreated, would eventually cause extensive decay or damage. The following recommendation were made**:**

i. There should be adequate provision for roof gutter.
ii. Proper drainage should encourage.
iii. Building materials must be standard.
iv. Design and its construction must be dampness free.
v. There must be adequate penetrating dampness treatment.

References

Abu Bakar Y, and Mbamali U., (2011): Strategies for maintenance of building services installation. Nigeria Journal of construction technology and management 3(1)127-140.

Ahmad H and Abdul Rahman P. (2010); Dampness in building, Department of Environment and Natural Resources of the City of Adelaide, 1997).

Ahmed M.I., and Rahman D.P (2010). Prevalence of respiratory symptoms in relation to indoor dampness. The Rhine Study. Thorax. 61 (3), 221-225.

Athauda, R.S.; Asmone, A.S.; Conejos, S. Climate Change Impacts on Facade Building Materials: A Qualitative Study. Sustainability 2023, 15, 7893. https://doi.org/10.3390/su15107893.

Beall, C. (2000). Water penetration in building envelopes. Retrieved from http://www.rci-online.org/interface/2000-10-beall.pdf.

Briffett, C. (1994). Building Maintenance Technology in Tropical Climates-Investigating dampness problem in buildings, Singapore. Singapore University Press.

British Standard BS 3811 (1984). British Standard Glossary of maintenance management terms in terotechnology. British Standard Institution (BSI).

Burkinshaw, R., & Parrett, M. (2004). Diagnosing damp. Coventry: RICS Book.

Chris Scott (2024). Causes of dampness houses.https://www.permagard.co.uk/advice/causes-of-damp-in-houses#:~:text=Condensation%20is%

FEDPOLAD Journal of Engineering & Environmental Studies (FEDPOLADJEES) is a Bi-Annual Publication Series of the Federal Polytechnic, Ado-Ekiti, Ekiti State. For more details, kindly visit *https://seemjournals.fedpolyado.edu.ng/index.php/fedpoladjees*. All critics, reviews, correspondence, or submission of articles for scholarly publication in the next edition of this Journal should be forwarded to seemjournal@fedpolyado.edu.ng. For more enquiries, please contact +234 806 701 4621 or +234 803 506 0823.

20the%20most%20common,be%20deposited%20on%20the%20surface.

Cukierski, G. (1999). Moisture condensation at the windows. Housing Fact Sheets. Cornell Cooperative Extension.

Fincrete Global (2022). The causes of dampness in building and preventive measures.https://fincreteglobal.com/the-causes-of-dampness-in-building-and-preventive-measures/

Halim, A. A., & Halim, A. Z. (2010). An analysis of Dampness Study on Heritage Buildings: A Case Study Ipoh Old Post Office Building and Suluh Budiman Building, UPSI, Perak, Malaysia. Journal of Sustainable Development, 3(4), 171-182.

Halim, A. A., Harun, S. N. and Hamid, Y. (2012) 'Diagnosis of dampness in conservation of historic buildings', Journal *Design + Built*, Vol. 5.

Hetreed, J. (2008). The damp House: A Guide to the causes and Treatment of Dampness.

Hollis, D. (2000). Perspectives for the implementation of lean construction in the Ghanaian Construction Industry. Journal of Construction Project Management and Innovation. 2 (2), 345-359.

Hollis, M. (2000). Surveying Building, Coventry, RB-RICS Books.

Karoglou, M., Moropoulou, A., Krokida, M. K., & Maroulis, Z. B. (2007). A powerful simulator for moisture transfer in buildings. Building and Environment, 42, 902-912. http://dx.doi.org/10.1016/j.buildenv.2005.10.008.

Marco, A. Ortiz, Stanley, R. Kurvers, Philomena M. Bluyssen (2017). A review of comfort, health, and energy use: Understanding daily energy use and wellbeing for the development of a new approach to study comfort. Energy and Buildings. Volume 12, 1 October, 2017, pp. 323-335. https://doi.org/10.1016/j.enbuild.2017.07.060.

Mudarri, D., & Fisk, W. J. (2007). Public health and economic impact of dampness and mold. Indoor Air, 17(3), 226-235. http://dx.doi.org/10.1111/j.1600-0668.2007.00474.x.

Nemmadi N. (2019). Dampness – Types, Causes, Signs and Solution. https://nemmadi.in/dampness-types-causes-signs-and-solution/ Retrieved on Monday, February 26th, 2024.

Riley, M. & Cotgrave, A. (2005). Dampness in Buildings. Division of Sustainable Development. Available http://folders.nottingham.edu.cn.

Seeley, I. H. (1994) 'Building maintenance', The Macmillan Press Ltd. London.

Trotman, I.A.; Aniya, J.U; and Lawal, L.A.T (2004). Intelligent Buildings: Buildings as robots. Journal of the Association of Architectural Educators in Nigeria. (AARCHES J). Vol. 6(3) pp 93-98.

World Health Organisation, WHO, (2009). Guidelines for indoor air quality: Dampness and Mould. ISBN: 9789289041683.

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