

Name and Student Number: Jo McDonough - 2408631

Assignment Number: ECEY6005

Assignment: A portfolio reflecting exploration of sustainability through practical experience, creative documentation and academic evaluation.

Scrapbook link: <https://canva.link/quoeu1ggx6qkms6>

Video link: <https://uowtsd->

my.sharepoint.com/:v/g/personal/2408631_student_uowtsd_ac_uk/IQASUdtUXqW_SLRcsEYadwb_AZlg2WAJNdkcrILM2OvnGMU?nav=eyJyZWZlcnJhbEluZm8iOjEwcmVmZXJyYWxBcHAI0iJPbmVEcmI2ZUZvckJ1c2luZXNzliwicmVmZXJyYWxBcHBQbGF0Zm9ybSI6IldlYiIsInJlZmVycmFsTW9kZSI6InZpZXciLCJyZWZlcnJhbFZpZXciOiJNeUZpbGVzTGlua0NvcHkifX0&e=iXIPe8

Page 2: Script for scrapbook and academic presentation – Sustainability in Action

Page 10: Reference list.

AI Statement:

Throughout the duration of this assignment I acknowledge the use of the following

- <https://www.canva.com/> to create a scrapbook.
- <https://copilot.microsoft.com/chats/uWfmGxnT1d6Cv1bTnZhjv> using the following prompts:
 - To check my own text for grammatical and syntactical mistakes and for suggestions to rephrase my own work.
 - Find and summarise data in relation to sustainability in the early years and climate change.

Scrapbook Script

Hi, my name is Jo McDonough, today I am going to take you from the practical sustainability work captured in my scrapbook through to the academic section of the presentation. I'll show how rainwater harvesting activities link with early years theory, Welsh policy, and how these simple hands on experiences support sustainability learning for early years children.

This scrapbook captures the journey on our allotment, showing what we've discovered, explored, conserved and shared within a small community green space, and how it has helped me understand sustainability in a practical, personal way.

Run through the scrap book

- Discover – the space, wildlife, soil, first impressions
- Explore – include seasonal changes, new methods (no dig)
- Conserve – building the compost heap, bug hotel and water source, water conservation, reuse and repurpose of materials, planting trees as early pollinators, before and after
- Share – any moments shared with family and friends

Reflection

Creating the scrap book and completing Part 1 of the assignment has helped me understand my relationship with sustainability. Documenting the changes at the allotment has shown me that practical sustainability, small-scale conservation, like reusing materials, building habitats, and tending an allotment, can be both achievable and deeply meaningful. It has shown me that sustainability is accessible and rooted in ordinary and everyday spaces rather than something that is distant or complex.

The creative process of the scrapbook has helped me see patterns, notice growth more in-depth and recognise my developing sense of stewardship, making my thinking visible which written notes alone could not. By organising my observations, actions, and reflections, the scrapbook created a clear narrative of how my understanding of sustainability has expanded through hands on experience, creativity, and care for a small but significant green space.

Overall, creating this scrapbook has helped me move from simply knowing about sustainability to actively practising it. Through documenting my allotment journey, I have developed a deeper, more personal understanding of what it means to care for a place and contribute to its wellbeing.

Looking ahead we want to continue developing the allotment in ways that build on the sustainability practices that have already started. We want to add a small shed, additional water butts and guttering to improve rainwater collection from the roof of the greenhouse and shed extending what we have already put in place. We're also looking forward to experimenting with new crops for the next season, refining what works well on the plot, and continuing to use reclaimed materials wherever possible. These next steps feel like a natural continuation of what we have already started, helping the allotment evolve while deepening our sustainable practice.

Academic Script – Rainwater harvesting

Following on from the practical sustainability in part 1 in relation to rain water harvesting, including the water butts, repurposed materials to channel more water and the water source for wildlife, this section explores how these experiences relate to early childhood education for sustainability. The United Nations Sustainable Developmental Goals (SDG's) provide a global framework of 17 interconnected targets to address urgent social, economic and environmental challenges by 2030, emphasising collective responsibility, long term thinking and global citizenship. Several of these goals are directly relevant to rainwater harvesting: SDG 6, Clean water and sanitation, focusing on protecting freshwater resources and improving water quality, SDG 9, industry, innovation and infrastructure, promoting resilient, sustainable solutions to environmental pressures and SDG 15, life on land, protecting ecosystems and bio diversity. These global priorities align closely with early years sustainability education, where children begin to understand water as a precious, shared resource and explore how small scale actions connect to wider environmental issues affecting Wales and the world (Parenta Group, 2022; Tinney and Merriman, 2018). Sustainable development is widely defined in the Brundtland Report as meeting present needs without compromising the ability of future generations to meet their own, a principle that underpins both global sustainability

frameworks and early childhood education for sustainability (World Commission on Environment and Development, 1987).

Examining rainwater harvesting as a meaningful, hands on sustainability action allows us to explore how such experiences align with Welsh policy, early years theory and the principles of Education for Sustainable Development and Global Citizenship (hereafter ESDGC). It also enables consideration of the opportunities and limitations of using practical environmental activities to support early years children's developing and understanding of sustainability.

Although small in scale at the allotment, rainwater harvesting reflects much larger global sustainability challenges that directly affects children's futures. Early childhood research shows that young children benefit from hands on environmental experiences that build ecological understanding and agency from an early age (Boeve-de Pauw *et al.*, 2018). The SDGs highlight the urgency of protecting water resources, strengthening sustainable infrastructure and safeguarding ecosystems for future generations (UN, 2015). These priorities have become increasingly urgent in light of recent climate patterns across Europe, where extreme heatwaves, flash flooding and prolonged droughts throughout 2024-2026 demonstrate how climate change is intensifying weather instability (Poynting *et al.*, 2026; Murphy, 2026; Niranjana and Carrington, 2026). The European Environment Agency similarly reports that climate change is placing growing pressure on freshwater systems, biodiversity and community resilience across Europe with the most vulnerable, including children, being most effected (European Environment Agency, 2026). Children are particularly vulnerable to climate related hazards such as extreme heat, flooding and water quality issues. EU climate assessments emphasise that promoting children's health and wellbeing require urgent adaptation measures across communities and public services making early childhood sustainability education essential for building the competencies they need to respond to environmental challenges throughout their lives (World Health Organisation, 2021; Unicef, 2021; European Scientific Advisory Board on Climate Change, 2023).

Wales faces similar pressures: repeated incidents of slurry spills, sewage discharge and river contamination involving Welsh water have raised significant concerns regarding water quality, biodiversity loss and long term health of Welsh ecosystems

(Natural resources Wales, 2025; Gosley, 2024). Welsh policy frameworks, particularly the *Well-being of Future Generations (Wales) Act 2015*, emphasise preventative action and minimising environmental impact, positioning water stewardship as a core responsibility for public bodies and communities. When translated into early years practice, small scale water harvesting becomes a developmentally appropriate way for children to engage with these wider issues. By observing rainfall, collecting water and using it purposefully, young children begin to understand water as a finite, shared resource while practitioners can draw parallels between local actions and the larger scale environmental challenges (Parenta, 2026).

Early years sustainability in Wales is shaped by policy frameworks that emphasise children's rights, belonging and ethical citizenship. This rights based approach is reinforced by the UNCRC which establishes children's entitlement to education that develops respect for the natural environment and supports their right to a healthy sustainable future (Unicef UK, 2019). Welsh policy positions sustainability as a core responsibility of education that begins in the early years. The Future Generations Act establishes sustainable development as a long term, preventative duty requiring public bodies to act in ways that protect the needs of future generations and ensure that children are educated and understand how their own actions contribute to environmental wellbeing. The Act's goals, such as a resilient Wales, a healthier Wales and a globally responsible Wales, translate into early childhood practice through outdoor learning, nature connection and experiences that build ecological awareness and wellbeing (*Well-being of Future Generations (Wales) Act 2015*; Welsh Government [hereafter WG], 2024; WG, no date).

ESDGC provides the educational framework that operationalises these ideas. It emphasises fairness, rights, democracy, environmental responsibility and global independence. Tinney and Merriman (2018) describe it as helping young children make sense of how we treat the earth and each other through real, meaningful experiences. In early years settings this equates to supporting children to understand simple but powerful concepts such as respecting and caring for living things, sharing resources, noticing weather and water patterns and beginning to see themselves as part of a wider world. This aligns with early childhood values of empathy, cooperation and belonging (Tinney and Merriman, 2018; Boyd and Hirst, 2018; WG, 2024).

The Curriculum for Wales and the Curriculum for Funded Non-Maintained Settings embed sustainability through experiential and inquiry based learning while foregrounding the Four Purposes

- *Ambitious, capable learners*
- *Enterprising, creative contributors*
- *Ethical, informed citizens*
- *Healthy, confident individuals*

These purposes position sustainability as integral to early years practice, particularly through developing ethical and informed citizens who understand their relationship with the natural world. The curriculum also introduces Cynefin, a Welsh concept referring to a sense of place, belonging and connection to their local environment. Cynefin encourages practitioners to create learning experiences that help children develop connection to their local surroundings, understand their relationship with the environment and recognise that their actions have consequences for the future (WG, 2024: WG, no date) Rain water harvesting is a clear example of Cynefin in practice, children observe weather patterns and falling rain, collect rainwater and use it purposefully within a familiar outdoor space.

These Welsh policy aims resonate strongly with early childhood theory. Dewey's emphasis on experiential inquiry based learning positions hands on engagement with natural materials, such as water, as central to understanding the world (Dewey, 1938; Luff, 2018; Hansen, 2018). Froebel's view of children as inherently connected to nature and his belief that gardens and outdoor environments support children's holistic development, further reinforce the value of practical sustainability experiences such as rainwater harvesting (Polito, 1995; Boyd, 2018; Boeve-de Pauw et al., 2018). Reggio Emilia also supports this approach, with Malaguzzi's concept of the environment as the third teacher highlighting how thoughtfully designed outdoor spaces can provoke curiosity, collaboration, creativity and sustained shared thinking and inquiry, all of which are key characteristics for sustainability in the early years (Boyd and Hirst, 2018)

The role of the adult is central to translating these theoretical ideas into meaningful sustainability practice. Adults act as enablers, co-learners, facilitators and intentional designers of the environment, creating opportunities for inquiry, reflection and ethical

decision making (WG, no date; WG, 2024). Through sensitive scaffolding, modelling behaviours and offering open ended questions, practitioners will help children make connections between their actions and the wider environmental issues. This aligns with Dewey's emphasis on guided inquiry, Froebel's belief in nurturing relationships with nature and Reggio Emilia's view of the adult as a partner in sustained shared thinking (Polito, 1995; Dewey, 1938; Boyd and Hirst, 2018). Vygotsky's sociocultural theory further strengthens this, highlighting how children develop deeper understanding through social interaction and sensitive scaffolding within the Zone of Proximal Development (Vygotsky, 1978). In rainwater harvesting activities, the adults role includes supporting observation, encouraging predication, enabling safe exploration and helping children reflect on water as a finite resource.

Together, Welsh policy and early childhood theory highlight that sustainability in the early years should be practical, relational and rooted in children's everyday environments. Experiences such as rainwater harvesting help children build dispositions of curiosity, care, and ethical awareness, while supporting the development of a resilient and globally responsible future generation. These experiences also reflect the preventative, long term, and rights based ethos of Welsh sustainability policy , demonstrating how early years practice can meaningfully contribute to national and global sustainability goals (Hedefalk et al., 2018; WG, 2024).

Rainwater harvesting aligns closely with core principles of ESDGC, particularly practical learning, futures thinking and taking action.

- Practical learning enables children to engage directly with real sustainability processes, through observing rainfall, collecting water and using it purposefully, they learn tangible cause and effect relationships that build ecological awareness and understanding (Tinney and Merriman, 2018; Howerton *et al.*, 2026). This also supports SDG 6 by supporting children to understand that water is not an endless resource, for example through conversations about unequal access to water and offering ladles and scoops in water play rather than jugs and buckets (Parenta, 2022).

- Futures thinking develops as children recognise how present actions, such as conserving water, contribute to protecting resources, reflecting the preventative, long term ethos of the Future Generations Act.
- Taking action is supported through stewardship tasks, checking water levels, watering plants and noticing weather patterns which all foster agency, responsibility and early ethical citizenship (Howerton *et al.*, 2026; Parenta, 2022). Ardoin and Bowers (2020) highlight that children's participation and action taking are central to early years sustainability education.
- Intergenerational learning which also strengthens these principles, as friends and family join in, children learn alongside adults and peers. This models sustainable behaviours reinforcing children's understanding of shared responsibility and behaviours (Boyd and Hirst, 2018).

John Muir's principles link closely to early years theorists, his belief in nature, connectedness, stewardship and experiential learning mirrors Froebel's view of children's inherent relatedness to nature and Dewey's emphasis on inquiry and hands on exploration and learning through real experiences (Sierra Club, 2026; Polito, 1995; Dewey 1938). Like Malaguzzi, Muir saw the environment as an active teacher that provokes curiosity and ethical awareness (UKY, 2026). These views align strongly with EDSGC values of fairness, care and responsibility. In terms of the allotment the rainwater harvesting actions created meaningful time for reflection and creative thinking as we observed the weather patterns, predicted water levels and have experimented with a range of ideas and materials of how to conserve water. This created opened ended shared thinking, problem solving and early action competence that we plan to continue across the rest of the allotment.

These principles show rainwater harvesting's potential, however its real educational value becomes clearer when the opportunities and limitations are considered.

Rainwater harvesting creates rich opportunities for early childhood sustainability learning because it is inherently hands-on, sensory and rooted in real-world experience. Children observe rainfall, monitor water levels and use collected water purposefully, engaging in the kind of experiential inquiry that Dewey argued

is essential for meaningful learning. Systematic reviews show that such practical, nature-based experiences strongly support curiosity, observation and problem-solving in early childhood (Ardoin and Bowers, 2020). These interactions deepen children's connection to place, aligning with Froebel's view of children's natural relatedness to their environment and supporting Cynefin. Participation in stewardship tasks fosters agency, fairness and responsibility, reflecting ESDGC principles and Tinney and Merriman's (2018) emphasis on ethical citizenship.

Despite these opportunities, several limitations shape how effectively rainwater harvesting supports sustainability learning. Access to outdoor spaces varies widely across early years settings, meaning some children have limited opportunities for nature-based experiences (Ardoin and Bowers, 2020).

Practitioners may also feel under-confident in teaching sustainability, which can result in activities remaining narrowly environmental rather than addressing social justice, global citizenship or economic dimensions (Boeve-de Pauw et al., 2018).

Risk-averse cultures around water play, weather or safety can further restrict experiential learning, reducing opportunities for inquiry and agency (Boyd and Hirst, 2018). Nature focused programmes such as the John Muir Award demonstrate how environmental activities can become disconnected from wider sustainability aims unless intentionally framed with ESDGC principles. Without this intentional framing, rainwater harvesting risks becoming a simple environmental task rather than a holistic sustainability learning experience that connects local action to global issues such as water scarcity, climate resilience and equity (UN, 2015; European Environment Agency, 2026).

In summary, rainwater harvesting demonstrates how practical, hands on experiences can make sustainability meaningful for the children by connecting global challenges to their everyday environments. When framed through Welsh policy, ESDGC principles and early childhood theory these actions support children's rights, agency and ecological understanding. Although limitations such as access, confidence and risk averse cultures remain thoughtful implementation ensures rainwater harvesting contributes to developing resilient, informed and ethically responsible future generations.

That brings us to the end, thank you for listening.

References

- Ardoin, N. M. and Bowers, A. W. (2020) 'Early childhood environmental education: A systematic review of the research literature', *Educational research review*, 31(100353), Available at: <https://www.sciencedirect.com/science/article/pii/S1747938X19305561> (Accessed: 11 July 2026).
- UKY (2026) *John Muir award: connect, enjoy and care for wild places*. Available at: <https://avontyrrell.org.uk/john-muir-award/> (Accessed: 11 July 2026).
- Boyd, D. (2018) 'Early childhood education for sustainability and the legacies of two pioneering giants', *Early years*, 38(2), pp. 227–239. Available at: <https://doi-org.uwtsd.idm.oclc.org/10.1080/09575146.2018.1442422> (Accessed: 11 July 2026).
- Boyd, D. and Hirst, N. (2018) 'Education for sustainability within early childhood studies: collaboration and inquiry through projects with children', *Education* 3–13, 46(7), pp. 839–849. Available at: <https://www.tandfonline-com.uwtsd.idm.oclc.org/doi/epdf/10.1080/03004279.2018.1430843> (Accessed: 10 July 2026).
- Dewey, J. (1938) *Experience and Education*. New York: Macmillan.
- Ellis, E. (2025) 'Drivers of nocturnal and diurnal pollinating insect declines in urban landscapes', *The Royal Society*, 25 August. Available at: <https://royalsociety.org/blog/2025/08/drivers-of-nocturnal-and-diurnal-pollinating-insect-declines-in-urban-landscapes/> (Accessed: 05 July 2026).
- European Environment Agency (2026) *Climate change impacts, risks and adaptation*. Available at: <https://www.eea.europa.eu/en/topics/in-depth/climate-change-impacts-risks-and-adaptation> (Accessed: 11 July 2026).
- European Scientific Advisory Board on Climate Change (2023) *Strengthening resilience to climate change: Recommendations for an effective EU adaptation policy framework*. Available at: <https://climate-advisory-board.europa.eu/reports-and-publications/strengthening-resilience-to->

[climate-change-recommendations-for-an-effective-eu-adaptation-policy-framework](#) (Accessed: 11 July 2026).

Gosley, E. (2025) 'Thousands launch giant environmental lawsuit over the state of three Welsh rivers', *WalesOnline*, 08 October. Available at: <https://www.walesonline.co.uk/news/wales-news/thousands-launch-giant-environmental-lawsuit-32631973> (Accessed: 11 July 2026).

Howerton, L., Lekhanya, N. D., and Sauerbier, C. (2026) 'Education for Sustainable Development in Early Childhood Education: A Systematic Literature Review', *Journal of foundational learning and child development*, 2(02), pp. 82-89. Available at: <https://doi.org/10.53905/ChildDev.v2i02.12> (Accessed: 11 July 2026).

Hua, J., Ren, C., Yin, Y. and Chen, W. Y. (2025) 'Effects of urban greenspaces on public health and wellbeing: Serial mediation model of objective and subjective measures', *Urban forestry and urban greening*. 106(128753), pp. np. Available at: <https://doi.org/10.1016/j.ufug.2025.128753> (Accessed: 05 July 2026).

John Muir Trust (no date) *About John Muir*. Available at: <https://www.johnmuirtrust.org/about-us/about-john-muir> (Accessed: 05 July 2026).

Luff, P. (2018) 'Early childhood education for sustainability: origins and inspirations in the work of John Dewey', *Education 3-13*, 46(4), pp. 447–455. Available at: <https://doi-org.uwtsd.idm.oclc.org/10.1080/03004279.2018.1445484>

Murphy, N. (2026) 'Europe's heatwave linked to 1,300 deaths, WHO says, as Germany hits record 41.7C', *BBC News*, 28 June. Available at: <https://www.bbc.co.uk/news/articles/cn4d2vv935lo> *Accessed: 11 July 2026).

Natural Resources Wales (2025) *SoNaRR 2025: Pollution*. Available at: <https://naturalresources.wales/evidence-and-data/research-and-reports/state-of-natural-resources-report-2025/pollution/?lang=en> (Accessed: 11 July 2026).

Niranjan, A. and Carrington, D. (2026) 'Western Europe records hottest-ever June as heatwaves intensify', *The Guardian*, 09 July. Available at: <https://www.theguardian.com/environment/2026/jul/09/western-europe-records-hottest-ever-june-as-heatwaves-intensify#:~:text=Western%20Europe%20recorded%20its%20hottest%20ever%20June%20in%202026&text=Western%20Europe%20is%20facing%20its,posed%20by%20worsening%20heat%20extremes>. (Accessed: 11 July 2026).

Parenta Group (2022) *Sustainability Matters in early Childhood*. Available at: (Accessed: 10 July 2026).

Polito, T. (1995) 'Frederick Froebel's illuminations on kindergarten children's relatedness to nature', *Education*, 116(2), p. 223. Available at: <https://research-ebsco-com.uwtsd.idm.oclc.org/plink/62a47d85-7f2e-3849-8671-8e072f53b0a0> (Accessed: 10 July 2026).

Poynting, M., Dale, B., Rivault, E. and Carr, J. (2026) 'Hotter and hotter and hotter' - Europe's new climate in seven charts', *BBC News*, 04 July. Available at: <https://www.bbc.co.uk/news/articles/c8e2j0j87reo> (Accessed: 11 July 2026).

Published Report

Sierra Club (2026) *John Muir: brief biography*. Available at: https://vault.sierraclub.org/john_muir_exhibit/life/muir_biography.aspx (Accessed: 05 July 2026).

Tinney, G. and Merriman, E. (2018) 'Early years education for sustainable development and global citizenship (ESDGC) – Two sides of the same coin', *Wales journal of learning and teaching in higher education*, 1(1), pp. 71-76. Available at: [https://repository.uwtsd.ac.uk/id/eprint/912/1/Tinney,%20Glenda%20and%20Merriman,%20Eileen%20\(2018\)%20Early%20years%20education.pdf](https://repository.uwtsd.ac.uk/id/eprint/912/1/Tinney,%20Glenda%20and%20Merriman,%20Eileen%20(2018)%20Early%20years%20education.pdf) (Accessed: 10 July 2026).

- Unicef (2021) *The Climate Crisis is a Child Rights Crisis*. Available at: <https://www.unicef.org/reports/climate-crisis-child-rights-crisis> (Accessed: 11 July 2026).
- UNICEF UK (2019) *A summary of the UN Convention on the Rights of the Child (UNCRC)*. Available at: https://www.unicef.org.uk/wp-content/uploads/2019/10/UNCRC_summary-1_1.pdf (Accessed: 11 July 2026).
- United Nations (2015) *Sustainable Development Goals*. Available at: <https://sdgs.un.org/goals> (Accessed: 11 July 2026).
- Vygotsky, L.S. (1978) *Mind in society: The development of higher psychological processes*. Cambridge, Massachusetts: Harvard University Press.
- Well-being of Future Generations (Wales) Act 2015* (anaw 2). <https://www.legislation.gov.uk/anaw/2015/2/contents> (Accessed: 11 July 2026).
- Welsh Government (2024). *A curriculum for funded non-maintained nursery settings*. Available at: <https://hwb.gov.wales/api/storage/1f581142-6b91-41e4-845d-3d6c7765df20/a-curriculum-for-funded-non-maintained-nursery-settings.pdf> (Accessed: 11 July 2026).
- Welsh Government (no date). *Curriculum for Wales*. Hwb. Available at: <https://hwb.gov.wales/curriculum-for-wales> (Accessed: 11 July 2026).
- World Commission on Environment and Development (1987) *Our Common Future*. Oxford: Oxford University Press.
- World Health Organisation (2021) *2021 WHO health and climate change survey report*. Available at: <https://www.who.int/publications/i/item/9789240038509> (Accessed: 11 July 2026).