Conceptual Framework for Assessing the Economic Impact of Nature-based Programmes on the Mental Health and Well-Being of Adolescents (secondary school-aged students)

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Background and activity overview

Mental health and well-being (MHWB) among students have become pressing concerns within schools in England, with increasing rates of anxiety, depression, and behavioural difficulties reported across age groups[1]. Schools are uniquely placed to support mental health through universal and targeted interventions, including Nature-based Programmes (NbPs)[2]. However, decisions around implementation require robust economic evaluation frameworks to ensure resources are used effectively [3]. While literature supports the cost-effectiveness of early intervention within educational settings, where emotional well-being is closely linked to academic attainment and life outcomes[4], current evaluations in England often lack consistency in methodology, making it difficult to draw comparisons and inform national policy reliably.

In England, there is growing interest in integrating NbPs into education, including initiatives such as forest schools, outdoor classrooms, and green school grounds. Evidence suggests these approaches can support students' executive functioning (self-esteem, confidence, emotional regulation, social skills, and stress recovery) [4-5].

Despite growing evidence of their benefits, implementing NbPs in schools remains complex and constrained. Embedding such programmes within the national curriculum and in school settings is often hindered by systemic pressures, including a strong emphasis on academic performance, accountability metrics, and inspection frameworks that prioritise measurable outcomes [6]. Furthermore, schools operate within tight timetables and face competing demands, making it difficult to allocate time and space for non-core activities. Additionally, limited teacher training in delivering NbPs, a lack of dedicated funding, and constrained school budgets further hinder the widespread adoption of these programmes [20, 21].

Addressing these structural barriers is essential if schools are to realise the full potential of NbPs for student wellbeing and learning. The literature recommends a whole-school blended approach that aligns mental health and environmental enrichment, supported by joined-up strategies across education, health, and local government [5]. Economic evaluation tools must therefore account for both direct and indirect outcomes to ensure that mental health and well-being are prioritised as fundamental to educational success in England [6].

In May 2024, the Department of Psychiatry, University of Oxford, received funding through the AGILE Sprint for the project " Is 'nature' a policy solution to mental health in schools?" The initiative aims "to support the development of evidence-based education policy strategy by equipping policy makers with the tools to identify effective nature-based intervention programmes that support mental health and wellbeing in young people". The project is being carried out in partnership with the Department for Education (DfE) as a strategic collaborator.

The project is structured into four work packages: WP1 focuses on evidence reviews of NbPs for MHWB; WP2 assesses the implementation of NbPs in the secondary school settings; WP3 develops an economic evaluation framework for the impact of NbPs on the MHWB of the secondary school-aged children (referred to as students hereafter); and WP4 synthesises the findings from WP1, WP2, and WP3.

This report summarises the contributions and activities of Work Package 3 (WP3), which focuses on designing a health economic model to evaluate the economic implications of implementing NbPs in the schools. The underlying aim behind designing this framework is to provide a robust, evidence-based tool that enables policymakers, to make informed decisions regarding the implementation and scaling of NbPs. By assessing the economic implications, impact on mental and physical health, and broader educational and societal outcomes, the framework aims to demonstrate the long-term value, sustainability, and cost-effectiveness of NbPs, thereby guiding future investments in these programmes to improve the well-being of the students in England.

Summary and contribution to the project:

The following section outlines the key activities and contributions of WP3, beginning with the identification of relevant outcomes through literature review.

T3.1 Identifying relevant outcomes and costs

Task 3.1 focused on identifying the key outcomes and costs necessary to evaluate the value of NbPs for supporting the MHWB of students in school settings. This task played a foundational role in the development of the economic evaluation framework by providing the essential components for assessing programme impact.

Drawing on outputs from WP1 (evidence synthesis) and WP2 (stakeholder engagement), including the robustness of evidence review, we conducted a targeted literature review to extract and categorise relevant economic, psychological, and educational outcomes, as well as associated costs.

Key Insights from the literature review:

Mental health issues among students represent a serious societal concern due to their high prevalence (One in five children and young people aged 8–25 had a probable mental health disorder in 2023, with rates rising to 23.3% among 17–19-year-olds), the significant subjective burden of illness, and the substantial negative economic consequences such as loss of productivity. Poor mental health among CYP is estimated to cost the UK economy over £300 billion annually [22]. NbPs within school settings, can help improve mental health and well-being, it may offer benefits across several of these domains identified:

1- Individual-level

Students' MHWB had a huge impact on individuals' physical health. A study [8] revealed that anxiety in childhood and adolescence can lead to long-term physical health issues, including severe allergies, musculoskeletal problems, neurological disorders, and cardiovascular diseases. Specifically, adolescents with co-occurring Axis I disorders and personality disorders (PD) had higher odds of pain (OR 1.55, 95% CI 1.03–2.34) and poorer physical health (ES −0.16, $p < 0.05$), while those with PD alone showed even greater odds (OR 1.73, 95% CI 1.15–2.62) and a faster decline in physical health (1.6% per year, $p < 0.05$).

Additionally, a study [9] found that depression in teens leads to significant life impairments, affecting academic performance, peer relationships, family dynamics, and an individual's socio-economic status later in life. Depressed teens had lower academic achievement, with 57% of severely depressed teens achieving a grade point average (GPA) of 2.0 or lower, compared to 76% in those with less severe depression. The study also highlighted that less severe depression was associated with fewer days of impairment (13.6 days) compared to moderate (19.9 days) and severe depression (26.2 days).

2- Household-level

MHWB in and children and adolescents also affect family functioning and income. For instance, in a study [9], families of children with anxiety were 4.5 times more likely to report some level of negative family impact compared to families of children without a psychiatric diagnosis (odds ratio [OR] = 4.5; 95% CI: 3.1–6.3, $p < .0001$). Furthermore, the number of domains affected—such as finances, relationships, routines, and overall well-being—was 4.1 times greater in these families (risk ratio [RR] = 4.1; 95% CI: 3.3–5.1, $p < .0001$).

Importantly, these associations remained significant even after adjusting for the presence of comorbid conditions such as oppositional defiant disorder/conduct disorder (ODD/CD), depression, and ADHD. In this adjusted model, families of children with anxiety were still 3.5 times more likely to report negative impacts (OR = 3.5; 95% CI: 2.4–5.3, $p < .0001$) [9].This, in turn, increases the indirect costs related to caregiver absenteeism, financial strain, and mental health challenges among family members[10, 11].

3- School-Level:

Students' mental health can profoundly disrupt school systems by increasing academic disengagement, absenteeism, and behavioural issues. These challenges demand significant attention and resources, shifting focus from instructional goals to crisis management. Unmet MHWB needs lead to frequent classroom disruptions, such as poor concentration, emotional outbursts, and withdrawal, that hinder individual and collective academic progress [10].

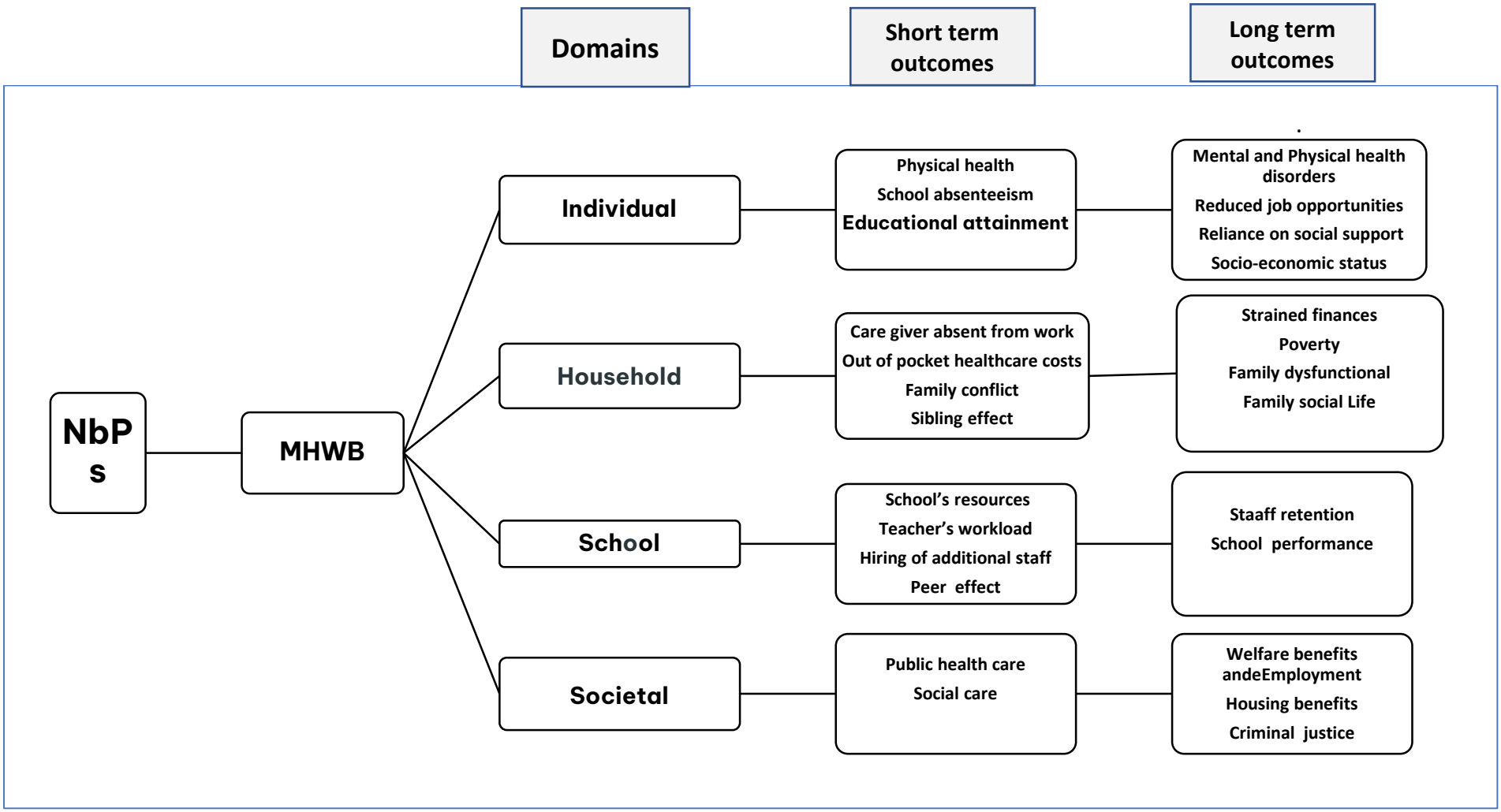
The repercussions extend to staffing and overall school climate. Poor MHWB contributes to teacher stress, burnout, and attrition, driving up human resource costs through the need for substitutes and recruitment of new staff. Loss of experienced educators disrupts continuity, reduces instructional quality, and places additional burdens on remaining staff, creating a cycle

of overwork and further attrition. These compounding effects degrade morale, weaken professional collaboration, and increase the overall HR cost for schools [13].

4- Societal-level

Positive MHWB outcomes in students lead to reduced long-term reliance on public health services, social care systems, and even the criminal justice system[8, 12]. These broader effects result in measurable economic savings for public institutions and communities. Although the literature on estimating the direct and indirect costs of these indicators, particularly in terms.

Figure 1: Conceptual Framework for Evaluating the Impact of NbPs on Students' MHWB- potential list of outcomes



Proposed evaluation framework:

Figure 1 outlines key outcomes/indicators, categorised by domain, which serve as the foundation for both economic modelling and empirical assessment. This framework is intended to serve as a template for future impact evaluations of NbPs or similar interventions targeting students' mental health. While the core indicators remain consistent, the evaluation design will be tailored to the nature of the programme and its implementation. Depending on context, evaluations may take the form of:

- Experimental designs (e.g., randomised controlled trials),
- Quasi-experimental designs (e.g., matched comparison groups),
- Qualitative studies (e.g., case studies, narrative evaluations), or
- Mixed-methods approaches to combine quantitative rigour with rich contextual insights.

Task 3.2: Summary of stakeholder engagement – DPA workshop findings

Task 3.2 involved conducting a Deliberative Policy Analysis (DPA) workshop with a diverse group of stakeholders, including young people, educators, and representatives from the Department for Education (DfE) and Natural England.

Workshop purpose and structure

The framework was presented twice: initially to provide an overview, and later to facilitate in-depth discussion through cohort-based group work. This structure allowed participants to offer both general feedback and targeted, experience-informed insights.

Reframing the framework

Stakeholders broadly endorsed the framework, confirming it as a sound foundation for evaluating NbPs. However, they also highlighted the need for greater clarity around its purpose, audience, and scope. Key themes included:

- Target audience: Educators questioned whether the framework was designed for use in schools or by policymakers. Representatives from the DfE and Natural England clarified that policymakers are the primary audience, particularly those involved in strategic planning and funding decisions.
- Level of specificity: Educators favoured a more tailored approach, with sensitivity to school type, geographic context, and socio-economic background. Conversely, DfE stakeholders supported a more generalisable model aligned with national policy frameworks.
- Benefits vs. impacts: Students and educators called for a clearer distinction between benefits and potential negative outcomes. They found the current presentation—mixing staff retention with issues like family dysfunction—confusing, and recommended a more focused, benefits-led narrative to improve usability and coherence.

Suggested refinements

Stakeholders offered valuable suggestions to refine the design of the framework, with differing preferences based on their perspectives. Policymakers, particularly from the DfE and Natural England, expressed support for a linear model that could clearly trace cause-and-effect pathways. However, students and some educators felt this approach was too simplistic, failing to reflect the interconnectedness of mental health and wellbeing (MHWB outcomes) or the diversity of student experiences, such as neurodivergent vs. neurotypical students.

Key suggestions included:

Inclusivity and Representation: Students raised concerns about how marginalized or under-resourced groups would be represented in the model, especially in terms of access, participation, and the differentiated impacts on various student groups.

- Timeline and transitions: Students also pointed out gaps between short-term and long-term outcomes, particularly how early impacts, like school absenteeism, relate to longer-term effects, such as career outcomes.
- Equity and participation: Students highlighted barriers such as a lack of appropriate clothing or resources that hinder full participation in outdoor activities, stressing the need for more equitable access to NbPs.

Stakeholders suggested the following new additions to the levels and domains of the proposed evaluation framework.

- Teachers should be included under the "Individual" domain, recognising their vital role in programme delivery and the impact on their own MHWB.
- A Community level should be added to capture the wider societal ripple effects of NbPs beyond the school environment.
- Nature/Environment should be considered both an outcome and stakeholder, acknowledging the mutual benefits between human well-being and ecological health.

Task 3.3: Revised health economic evaluation framework to assess the impact of NbPs on MHWB of the students

Building on stakeholder feedback, the evaluation framework was refined to maintain its universal applicability while integrating key insights to improve clarity and relevance. The model retains a linear structure, which supports clear communication and policy use, but now more effectively links short-term changes to long-term impacts.

While no new domain was added, a new outcome category—Nature—was introduced under *Social Outcomes* to reflect the mutual benefits between human wellbeing and the natural environment.

As suggested by the DfE team, the framework now begins with a counterfactual scenario—a situation in which students' MHWB needs go unmet. This enables the comparison of negative projected outcomes (such as academic failure or long-term mental health issues) with the positive trajectories that could result from timely nature-based interventions. This structure aligns with standard practices in economic evaluation and supports various methodological approaches, including experimental, quasi-experimental, qualitative, and mixed methods designs.

To better visualise the balance between cost and benefit, we have also introduced a J-shaped curve model, which represents a benefit-led approach. In economic terms, one side of the model reflects the costs of delivering NbPs, such as equipment, appropriate clothing, and teacher training, while the other estimates the value of improved outcomes. For example, untreated anxiety might lead to chronic absenteeism and poor academic performance, whereas with timely intervention, outcomes like attendance, focus, and emotional regulation are likely to improve.

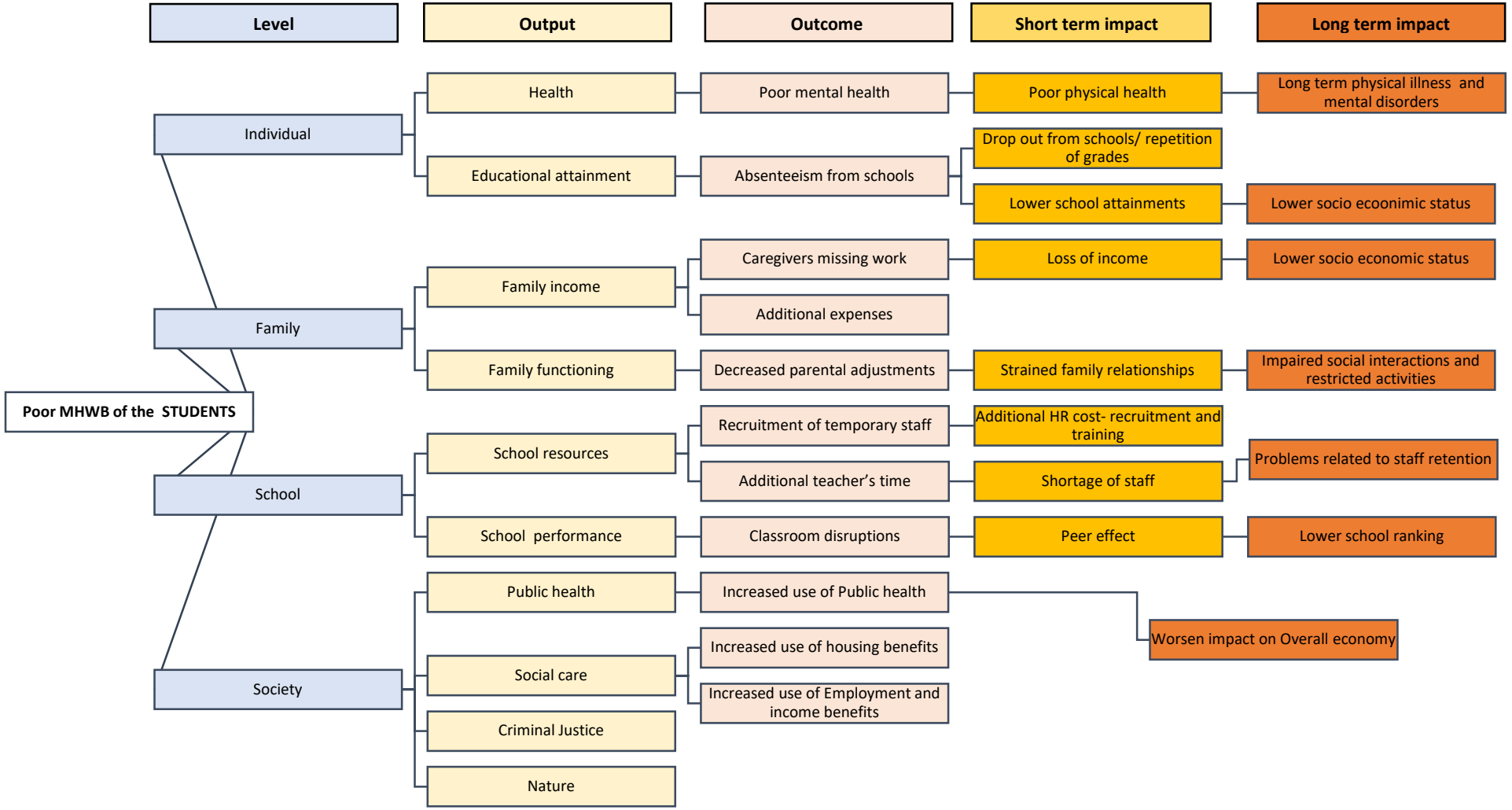
This conceptual shift from deterioration to recovery and growth forms the basis of the impact model presented in Figure 2, which starts with poor MHWB as the baseline, assuming no intervention.

This prototype model incorporates both quantitative and qualitative inputs, offering flexibility depending on the strength of available evidence and data. It is intended to support schools and policymakers in determining whether the anticipated benefits of NbPs—such as improvements in emotional regulation, concentration, attendance, and long-term educational attainment; justify the required investments, including staffing, training, and the upkeep of natural infrastructure. As shown in the Figure 1, overlapping factors such as socio-economic status and other school-based interventions are identified as potential outcomes considered in the economic evaluation of NbPs' impact on students' mental health and wellbeing (MHWB).

Building on this foundation, Figure 2 expands the framework by presenting a more comprehensive impact evaluation model. It not only maps the pathways leading to recovery and growth but also incorporates a *negative scenario*—illustrating potential adverse outcomes when students' MHWB needs remain unmet.

By doing so, Figure 2 offers a deeper understanding of the bidirectional nature of NbPs' influence, recognising that the absence or insufficiency of such interventions may contribute to poorer emotional, behavioural, and academic outcomes.

Figure 2: Reframed Conceptual Framework for Evaluating the Impact of NbPs on Students' MHWB- Highlighting Potential Negative Outcomes When Needs Are Unmet[SA1]



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Benefit-led approach- economic evaluation programme

Another way to conceptualise the cost-benefit dynamics is through a J-shaped curve (refer to Figure 3). This illustrates how investments in the NbPs to improve the MHWB among secondary school students may initially increase costs. However, over time, these interventions are expected to yield substantial benefits, such as improved health outcomes, reduced service use, and increased productivity, resulting in a net positive return [6, 8, 13].

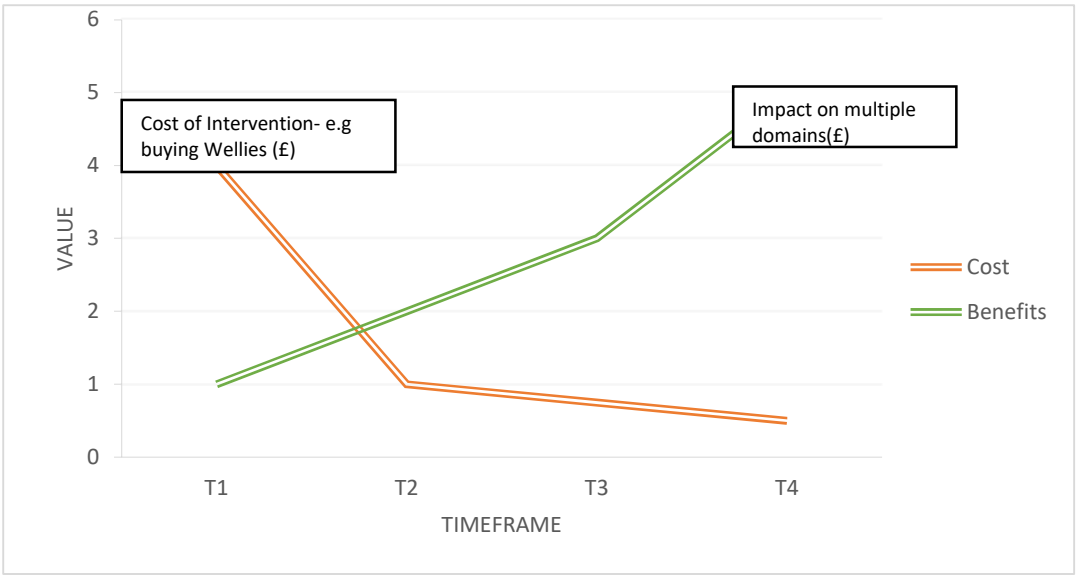
The J-shaped curve can be applied as a benefit-led conceptualisation of the proposed model. Initially, the perceived benefits of intervention may be limited, while the associated costs appear high. This reflects the early phase of implementation, where improvements in MHWB unfold gradually as students begin engaging with nature-based activities. At the outset, the perceived benefits of such interventions may appear minimal, while costs—both financial and practical—can seem disproportionately high. This early implementation phase often involves significant upfront investment: for example, purchasing Wellington boots for students to ensure they can participate safely and comfortably in outdoor activities, regardless of weather. Other expenses may include waterproof clothing, gardening tools, training for staff, and logistical support such as transport to green spaces or adapting school timetables. Though these costs may seem high, especially when improvements in MHWB are not yet visible, they lay the foundational infrastructure needed for long-term success.

For instance, emotional regulation may show only modest progress at first, with students continuing to struggle with stress and anxiety. However, the positive effects become more pronounced over years, manifesting as stronger emotional resilience, improved concentration, and enhanced overall mental health [6,7].

In the family domain, nature-based programmes (NbPs) may reduce household stress, with parents reporting better communication and behaviour from their children. Within schools, teachers may observe a decline in disruptive behaviour alongside improvements in focus and attendance[8]. At the community level, the long-term impact of NbPs may include stronger social ties and enhanced community cohesion, as shared experiences in natural settings contribute to collective well-being [9].

This J-shaped trajectory highlights that the benefits of NbPs compound over time, underscoring the long-term value of sustained engagement with nature in enhancing the well-being of secondary school students, as well as the broader impacts on individuals, schools, households, and the wider economy [22]. While “wellie boots” may seem like a small line item, they represent something bigger: a commitment to inclusion and readiness, ensuring that every student, regardless of socioeconomic background, can access nature equitably. This type of investment not only breaks down practical barriers but signals to students and families that their wellbeing is being prioritised from the ground up.

Figure 3: J-Shaped Model Curve Illustrating the Cost-Benefit Analysis of the NbPs on the MHWB



Challenges and Implications:

Both the DPA data analysis and our literature review highlight that implementing NbPs in educational settings present significant opportunities to support students' MHWB. However, from an economic perspective, several trade-offs and challenges must be carefully considered, particularly the impact evaluation strategies. The extensive body of literature by Natural England shared internally with us, comprising more than 300 papers, suggested that the key challenge in evaluating the impact of NbPs on students' school, family, and broader social outcomes lies in the complexity of both measurement and attribution across multiple domains. For instance, defining and quantifying "time in nature" is not straightforward—it may involve curricular, non-curricular, or incidental exposures, each of which varies across schools. Likewise, for the family level outcomes like reduced household stress or improved communication, are difficult to assess quantitatively and often rely on inconsistent self-reporting.

Community or social cohesion impacts are even harder to trace, requiring long-term tracking and multi-source data integration. Moreover, as the methodology document notes, while a randomised controlled trial would offer the most robust evidence, it is often impractical in educational contexts. Thus, observational comparative designs must rely on naturally occurring variations in exposure, which introduces challenges in controlling for confounding variables and ensuring representativeness. These limitations underscore the need for clustered observational designs with repeated measures, complemented by mixed-methods approaches, to better capture the nuanced and cumulative effects of NbPs across child, school, and social domains of their monetisation, which remains limited[14].

In terms of the evaluation method, literature is split between cost-benefit analysis (CBA) and social return on investment (SROI). Initially, we propose a Cost-Benefit Analysis (CBA) approach as a robust method to inform evidence-based decision-making regarding these interventions. As CBA provides a systematic economic assessment by converting all costs and benefits of an intervention into monetary terms to determine if the benefits outweigh the costs. [15]. In the context of NbPs, the concept of "green prescribing" offers a compelling parallel for CBA application. A report by The Wildlife Trusts, "A Natural Health Service: Improving Lives and Saving Money," presented CBA-like findings, indicating that targeted green prescribing initiatives (where individuals are referred to nature-based activities) could yield substantial healthcare cost savings. The report projected potential savings of over £635 million per year if implemented widely, with specific programmes demonstrating benefit-cost ratios ranging from £1.19 to £2.16 in healthcare cost savings for every £1 invested Illustrative monetised benefits in such analyses include reduced general practitioner (GP) visits for mental health concerns, decreased reliance on prescription medications for anxiety or depression, and lower associated costs for mental health support services[16]. While improved productivity and attendance are also potential benefits, their direct attribution to school-based NbPs in these broader examples can be challenging for robust CBA, underscoring a common limitation of the model—the difficulty in fully monetising all direct and indirect benefits and establishing a precise counterfactual (i.e., what would have occurred in the absence of the intervention[17].

Nature England in their recent summary of the literature review mentions that key economic evaluation method in this context are—Social Return on Investment (SROI), which can be more applicable and feasible[3]. SROI is a comprehensive framework designed to measure and account for the social, environmental, and economic value generated by an intervention, often monetizing outcomes not typically traded in markets [17].Its utility for evaluating NbPs in educational contexts is exemplified by a notable forecast SROI study in the UK. This study explored the social value derived from embedding learning outside the classroom (LOtC) in natural environments as a whole-school approach within primary schools. The analysis forecasted a substantial SROI of £4.32 for every £1 invested, with a sensitivity range between £2.87 and £4.70 (Council for Learning Outside the Classroom, 2023). While the full scope of monetized outcomes in such studies is extensive, illustrative examples include improved confidence and self-esteem (often proxied via wellbeing scales), increased engagement and motivation in learning (e.g., reduced absenteeism or enhanced academic focus), enhanced social skills and cooperation (e.g., reductions in behavioural issues or improved peer relationships), and benefits accruing to teachers (e.g., reduced stress, increased job satisfaction, potentially mitigating staff turnover costs). A critical challenge highlighted in this research, however, remains the difficulty in fully attributing all

observed benefits solely to LOtC due to multiple concurrent influences and the inherent complexity of assigning precise financial proxies to inherently intangible benefits [4].

Other policy consideration: Trade-offs in Implementing NbPs in Schools

Furthermore, implementing NbPs in schools involves certain trade-offs that must be carefully considered to ensure balanced decision-making. Table 1 outlines these key trade-offs along with their potential implications.

Trade-off	Description	Implications
Time vs. Wellbeing Support	Time spent on NbPs may be seen as reducing academic learning time.	May generate resistance from students and staff under exam pressure; necessitates careful scheduling and communication about the value of MHWB.
Perceived Relevance vs. Long-term Benefit	NbPs may not be viewed as contributing directly to academic or career outcomes.	Without perceived relevance, students may disengage; interventions should be linked to transferable skills (e.g. focus, resilience).
Targeted vs. Universal Delivery	Targeted approaches may be more efficient but can increase stigma; universal approaches promote equity but are resource-intensive.	Requires balancing equity with feasibility; careful framing and delivery are essential to avoid reinforcing stigma (as with free school meals).
Additional Demand vs. Integrated Learning	NbPs can feel like an added demand on top of existing workloads for both students and teachers	Integration into the curriculum (e.g. outdoor math's) can reduce perceived burden and enhance both academic and wellbeing outcomes.
Short-term Disruption vs. Long-term Resilience	Implementation may require changes to schedules, staffing or space.	Initial disruption may yield long-term benefits in student regulation, engagement, and school climate. Sustained commitment and evaluation are key.

These trade-offs highlight that NbPs should not be positioned as a competing priority, but rather as a complementary strategy that enhances both learning and wellbeing. Successful implementation depends on thoughtful integration, co-design with stakeholders, and clear communication of both short- and long-term benefits.

Another ongoing debate about the practical implications of the NbPs in the schools are around universal versus targeted interventions, particularly when viewed through the lens of an economic evaluation framework. From this perspective, decisions about intervention design must consider not only the distribution of benefits but also the cost-effectiveness and equity implications of different delivery models. Universal NbPs delivered to all students often involve higher initial costs (e.g., providing wellie boots, outdoor clothing, or additional staff training), but these investments may yield widespread and sustained benefits across the entire school population. Universal provision can reduce stigma, support early intervention, and foster a culture of wellbeing, potentially reducing future demand on specialist services.

In contrast, targeted interventions focus resources on those with the greatest need, offering more intensive support and potentially achieving higher impact per participant. However, these approaches may miss students with emerging or less visible needs and risk reinforcing inequities if access is not managed carefully. A blended model, incorporating universal access with layered targeted support, may provide the most economically and socially efficient balance—delivering broad benefits while ensuring that the most vulnerable receive tailored support. To sum up, while universal

interventions help avoid stigma and ensure broad access, they can be costly and may divert resources from those most in need. In contrast, targeted approaches must be handled sensitively to prevent reinforcing stigma, as seen with pupils receiving free school meals[18].

Way forward: strengthening the evidence base for NbPs provisions in schools

In conclusion, the activities undertaken throughout this sprint have collectively contributed to the development of a comprehensive framework for assessing the value of NbPs in promoting the MHWB of students in schools. The integration of NbPs into educational settings offers significant promise for enhancing students' mental health and overall wellbeing. Through evidence reviews, stakeholder engagement via the DPA workshop, and the establishment of a conceptual model outlining short-term and long-term outcomes, we have created a robust, context-sensitive decision-making tool. This tool integrates both qualitative and quantitative data, enabling schools and policymakers to effectively evaluate the costs and benefits of NbPs across four key domains: individual, school, household, and the overall economy. However, as highlighted, a key challenge lies in the complexity of consistently measuring and attributing the multifaceted impacts of these programmes across diverse domains such as school engagement, family dynamics, and broader social outcomes. To transcend this complexity and ensure NbPs are effectively recognised, funded, and scaled, a strategic and rigorous approach to evaluation is imperative.

1. Adopt a multi-modal evaluation framework: Moving forward, a comprehensive evaluation strategy should leverage a combination of established economic and social valuation models to capture the full spectrum of NbPs' benefits:

- Cost-benefit analysis (CBA): For a holistic economic justification, CBA should be employed to compare the total monetised benefits of NbPs against their total costs. This allows policymakers to assess whether the aggregate benefits—including cost savings (e.g., reduced healthcare interventions, decreased behavioural support needs) and increased societal value—outweigh the investment. CBA provides a common metric for comparing NbPs with other potential policy interventions[15].
- Social return on investment (SROI): Beyond direct financial returns, SROI powerfully captures the broader societal value of investments by identifying outcomes for individuals, families, and communities—such as greater resilience, reduced anxiety, and stronger social cohesion—and assigning credible financial proxies to these benefits. This is especially important for demonstrating the often intangible but deeply impactful value of nature connection[17].
- Multicriteria decision analysis (MCDA) While CBA and SROI are economic evaluation methods focused on monetising outcomes, they can be complemented by MCDA, which allows for the inclusion of non-monetary and qualitative factors in complex decision-making. [19] MCDA enables the systematic evaluation of diverse outcomes—such as improved resilience, reduced anxiety, and enhanced social cohesion—by weighing both tangible and intangible benefits according to stakeholder priorities. This integrated approach strengthens the case for investments in areas like nature connection, where the full impact spans economic, social, and environmental dimensions that may not be fully reflected in financial terms alone.

2. Enhance methodological rigour and data standardisation: To overcome current methodological inconsistencies and attribution issues:

- Standardise definitions: Develop clear, agreed-upon definitions for key variables, such as "time in nature" (e.g., differentiating between curricular, non-curricular, and incidental exposures) and the specific components of NbPs.
- Implement robust research designs: Prioritise longitudinal studies, quasi-experimental designs with strong comparison groups, and mixed-methods approaches that combine quantitative outcome data with rich qualitative insights into lived experiences and mechanisms of change.
- Improve data collection: Advocate for the systematic collection of relevant baseline and follow-up data on students' mental health and wellbeing metrics, alongside school-level

outcomes (e.g., attendance, engagement, academic progress).
- **Strengthen attribution:** Employ statistical techniques and qualitative inquiry to more accurately account for deadweight (what would have happened anyway) and attribution (the extent to which outcomes are due to the NbP versus other factors).

3. Foster cross-sectoral collaboration and knowledge exchange: Effective evaluation and subsequent policymaking demand collaboration. Academics, policymakers, educators, and NbPs providers must:

- **Co-design evaluations:** Engage all stakeholders from the outset in designing evaluation frameworks, ensuring relevance, feasibility, and shared understanding of desired outcomes.
- **Share best practices:** Establish platforms for sharing robust methodologies, successful programme models, and compelling evaluation findings to build a collective evidence base.
- **Develop policy-relevant tools:** Translate complex evaluation results into accessible formats (e.g., policy briefs, interactive dashboards) that directly inform decision-making processes.

By committing to this integrated and methodologically sound approach to evaluation, we can build an unassailable evidence base demonstrating the profound and lasting impact of NbPs on students' mental health. This will not only secure their place within educational policy but also unlock significant long-term benefits for the individuals, schools, families, and wider society.

Affiliations

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List of Acronyms

CBA – Cost-Benefit Analysis

DfE – Department for Education

LOtC – Learning Outside the Classroom

MCDA – Multi-Criteria Decision Analysis

MHWB – Mental Health and Wellbeing

NbP – Nature-Based Programmes

SROI – Social Return on Investment

UK – United Kingdom

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