

# Realising the Potential of UNESCO World Heritage Sites in the Derwent Valley to Advance the 2030 Agenda

Word Count: 2412

## 1. BACKGROUND TO THE STUDY

Since the emergence of manufacturing systems powered by machinery in the 18<sup>th</sup> and 19<sup>th</sup> centuries, the Derwent valley mills site was expanded to make room for Richard Arkwright's newly invented cotton spinning machine and improve production methods (UNESCO, n.d.).

The industrial revolution supported the local economy as it marked a large scale of textile production for the first of its kind in history using hydropower in a rural landscape. A remarkable industrial environment that has maintained its attributes and values for more than 200 years was created as a result of the requirement to provide housing and other amenities for the mill workers (UNESCO, n.d.). The Derwent valley mills was recognised on the world heritage list in 2001 by UNESCO on the basis of its monumental values and meeting selection criterion (ii) and (iv), depicting the site's landscape architecture (DVMWHS, 2019)

### (a). Reintroduction of hydropower at Cromford Mills

The ongoing Cromford waterpower project is constructed with an old 1957 KW hydro turbine and a 6m waterwheel that was previously used in the 18<sup>th</sup> and 19<sup>th</sup> centuries as a source of energy to power and heat the Mills buildings. This energy transformation will contribute to updating the existing 2020-2025 strategic and management plans of the Derwent areas and other UK world heritage sites, as well as the global attainment of the Sustainable Development Goals. This will be a big step to further harness hydroelectricity and make use of renewable energies as a potential power supply across the Derwent Valley communities (woods et al. 2010), and support the local economy.

Bringing heritage sites and community energy partnerships together to decarbonize using community ideas and engagements to address threats of climate change. The main objective of bringing the hydro power back to Cromford is to look for opportunities and generate money to source the reintroduction of renewable energy and pump money back into the community economy and business plan. Also, this hydro project will offset energy usage by 55,000 kw per year within the mill building. The current operation of the hydro engine is operating on a lower supply as compared to the 18<sup>th</sup> century when industries required continuous water power to operate (Jackson, 2021). In the energy white paper 'Powering our Net Zero Future' (December 2020), the central government does not include and recognize the current hydroelectricity power as a new source of renewable energy even though there is existing underused infrastructure (Jackson, 2021). The lack of progress in recent years regarding future hydroelectric power projects in the Derwent Valley, and parts of England can be attributed to this factor (Jackson, 2021).

Challenges of Cromford Hydropower project: Financial flow, investors and Archaeological misunderstanding with the British Geological Survey for excavating grounds.

### (b). Solar panels at heritage sites

The Derwent Valley area is facing political hierarchical challenges of installing solar panels on its heritage buildings. Many efforts have been declined by the town planning committees which is making it difficult to push the valley's strategy to decarbonize its operations and supplement the energy needs of powering the Mills buildings. The major reason for rejecting the solar panel proposal was stated to be the change in the physical appearance and architectural beauty of the historic sites as buildings need to be retrofitted into new designs which may affect the historic

fabric of the assets. However, in this current case of climate emergency, innovative plans and solutions of considering heritage sites and sustainability together should be prioritized ahead of other concerns to speed up the transition of the country's greener economy strategy. This would be a blueprint for other UK heritage sites to imitate and demonstrate contemporary actions towards achieving the net zero target by 2050 (Gov.UK, 2022). For example, after a long overhauling of objections to heritage concerns, Cambridge City Council finally approved King's College's plans to install solar panels on their historic chapel roof (Brown, 2023). The solar panel proposal was part of the college's carbon delivery to reduce its emissions by more than 27 tonnes per annum and net zero carbon by 2038 (Kings College, 2023). This news would inspire and encourage governments to support renewable energy funding in its heritage functions (Ross 2023). In addition to solar roofing, the Amber Valley seeks to advance the county's energy mix by covering car parks with solar grids as well. Sustainable projects like these will better address the Derwent Valley areas as a hub for innovative learning (promoting science and talents), visitors' choice, and historical significance – supporting the local economy, and businesses and also promoting the sustainable development goals from a unique community cultural perspective.

### **(c). Hosting a UNESCO International Conference?**

As the world faces abrupt climate shifts, it is becoming clear that no single nation can tackle this problem alone and involves global collaboration (European Commission, 2019). This is one of the drivers for the heritage site strategic group of hosting an international conference at the Derwent Valley next year to make communities feel part of an owned local legacy. This research will raise awareness to facilitate and feed into the existing proposals of the town councils to hold an international conference in 2024 at the Derwent Valley on addressing the impact of climate change and policy frameworks on UKs world heritage sites.

Furthermore, the conference will bring multiple stakeholders together to address the impacts of climate change on heritage sites, and create a community passion activism that inspires sustainable solutions to combat climate threats, and bridges connection between historic assets, people and the environment.

**“According to the Taking Part Survey, 94% of people agree or strongly agree with the statement “it is important to me that heritage buildings or places are well looked after.”**” (DCM, 2017). In the case of site protection, a community's ties to history is physically symbolized by the maintenance and preservation of such monuments (UNESCO, 2005 cited in Mekonnen et al. 2022, p.1). Data evidence proving a higher percentage of how people are tied to their cultural roots and what monumental buildings mean to them. Well-protected sites have a closer attraction to the mental health and well-being of individuals, and bring sensitivity to nature especially sites with rich ancestral history. However, integrating public concern to safeguard existing heritage sites would be helpful to mark the progress of attaining global Sustainable Development Goals and leave no one behind in this transition. An input of public perception resulting in collaborating as a key stakeholder to build a positive and effective changing resilient future.

## **2. PROBLEM STATEMENT AND JUSTIFICATION.**

The biggest threat to the world's heritage sites is climate change, escalating at a faster rate which calls for immediate attention to avoid severe deterioration (Markham, 2022).

There is a substantial risk that the Derwent valley mills could lose its world heritage recognition because of growing vulnerability to the risks linked with climate change, as well as detrimental repercussions that are disturbing the environment, economic and social-cultural welfare of humanity (“The Valley That Changed The World”, n.d.). Following the 2021 heavy flooding along

the Derwent Valley, many people attributed the problem to the depletion of trees and absence of natural floodplains (Massey, 2022). Hence, the need to prioritize the role of cultural heritage frameworks for climate resilience within current and future projection trends (Markham, 2022). Lost tourism value due to Covid-19 and irregular site visitation abandons heritage sites and disrupts the social lifestyle of local communities (Markham, 2022). In view of this, public socialization should be included in societal value recovery to improve human well-being and mental health - realizing the family dissociation and loneliness the pandemic brought to the world. Heritage is a significant driver of economic development and investment. The heritage industry is a multifaceted sector integrated within diverged economic and business activities, creating jobs to support local services (Historic England, 2020). Before the Covid-19 pandemic, the Derwent Valley Mills and nearby communities were booming economically projecting an estimated visitors contribution of £315m every year (DDDC, 2015-2019). Therefore, reviving the ecological human connection at the Derwent Valley and its tourism prestige is much needed to adjust the economy and business models for local communities (“The Valley That Changed The World”, n.d.).

### **3. AIMS AND OBJECTIVES**

The project aims to bring multiple stakeholders together at Cromford Mills and other UNESCO World Heritage Sites in the Derwent Valley to address the three main pillars of the interrelated Sustainable Development Challenges. Using the 17 Sustainable Development Goals (SDGs) as a framework, the project will:

- Investigate the ways site managers can collaborate with stakeholders and communities to identify the social, environmental, economic, and cultural impacts of the challenges they face.
- Educate local communities and businesses about flood prevention and mitigation strategies.

### **4. METHODOLOGY**

- Initial survey work in two of the communities involved (ie. Cromford Mill: Cromford Village: Belper Museum: Masson Mill in Matlock Bath: Darley Abbey Mills. (Qualitative). This research will apply multiple data-gathering instruments of structured interviews using an online questionnaire survey (Microsoft Forms).
- Three focus groups meeting with members of the Derwent Valley World Heritage Site strategic management group particularly focusing on climate risks. Topic discussion on board framing, “Bringing the conversation of climate change and the Derwent Valley Heritage Sites together”. This will be a pre-arranged meeting between the researcher and two of the community energy partnership groups.
- Target few schools as potential community engagements along with some local employees at the Mills. Delivering a program of climate education in a few targeted schools, understanding heritage conservation and finding volunteers with the necessary abilities to support future local projects. This will increase the public knowledge of ongoing activities taking place at the historic sites and provide access to information. Additionally, it will include possible implementation methods for plans to address issues related to sustainable development at both the sites and other locations (including neighborhood schools, colleges, institutions, and small county groups). The education programme will detail how the climate change challenge can be tackled using a stakeholder engagement and perspective approach contributing to the partnerships between local, regional, national and international levels on advancing the SDGs at historic sites.

- Cluster analysis with multivariate data of the initial survey data to determine groups of sites facing similar threats (Fávero and Belfiore, 2019). This technique was adopted to compare separate sites with similar problems that will prompt site managers on how to facilitate their future remedial actions.
- In methods of interpreting stakeholder engagement data, a SWOT analysis will be used to review the progress of the already existing site management plans and organization's performance towards sustainable development.

**(a). Proposed major interview questions. (sample)**

This is not the final structured topics to be discussed but the main questions seek to ask about the understanding of the 17 Sustainable Development Goals and its 169 targets in relation to how it can support the formulation of future management plans to protect the Derwent Valley Heritage Sites.

1. How deeply do participants understand the SDGs? How has their behaviour changed in response to the usage of heritage sites?
2. (Focus group question). Have whatever the city council done increased volunteers in these sites? (Staff absence). Brought passion to the local community to engage in these projects?
3. What is UNESCO (UK National) doing about the Sustainable development of heritage sites and communities down the valley?
4. (Focus Group question). What do people think of the idea of installing solar panels on their heritage buildings?

**Programme of works.**



## PROJECT PROGRAMME OF WORKS

**Manfred Kyenkyehene Osei**  
Researcher

**Arkwright Society**  
CLIENT NAME

**01-Jun-23 07-Sep-23**  
START DATE END DATE

Task Name	Start Date	End Date	Duration (In Days)	1-Jun-23	8-Jun-23	10-Jun-23	12-Jun-23	15-Jun-23	30-Jun-23	1-Jul-23	31-Jul-23	1-Aug-23	10-Aug-23	12-Aug-23	25-Aug-23	26-Aug-23	5-Sep-23	7-Sep-23	10-Sep-23	15-Apr-23	Future	
Structuring Questionnaire Survey	01-Jun-23	12-Jun-23	12	█	█	█	█	█														
Gatekeeper planning for participant meeting	10-Jun-23	15-Jun-23	6			█	█	█														
Literature Review	08-Jun-23	30-Jun-23	23		█	█	█	█	█													
Data Collection	01-Jul-23	31-Jul-23	31							█	█											
Data Analysis	1-Aug-23	10-Aug-23	10									█	█									
Discussion & Conclusion	12-Aug-23	25-Aug-23	14										█	█	█							
Proof Reading/Editing/Final Meeting with supervisors	26-Aug-23	5-Sep-23	11												█	█	█					
Project Presentation	7-Sep-23	10-Sep-23	4															█	█	█		
			Future																			

Fig 1: Project Timelines and work schedules.

**(b). Study area**

“The Derwent Valley Mills World Heritage Site consists of a 24km length of the lower Derwent Valley in Derbyshire in the East Midlands of England stretching from Matlock Bath in the north to Derby City Centre in the south.” (derwentvalleymills.org, 2019). The area consists of undulating forests, wide greenery space and reservoirs that houses three large dams on the River Derwent ([www.visitpeakdistrict.com](http://www.visitpeakdistrict.com), n.d.).



Fig 2: Study areas (in red circles) across the Derwent Valley where data will be collected

### **(c). Ethical considerations and limits**

The research will be embedded within the university's code of Research Ethics and agree to abide by. (See: <https://uniofnottm.sharepoint.com/sites/ResearchEthicsandIntegrity/SitePages/Code-of-conduct.aspx>). Strict research ethics will be adhered to when collecting data from people or organizations. The project considers to protect the rights of research participants, maintain data confidentiality, and using transparent means of collecting and sharing data. (Statistics Authority, 2022). This research will involve the participation of people and groups of different ages, ethnicities, and social backgrounds which will need coordination and arrangement of a gatekeeper for participants to be enlisted. The gatekeeper will be the organisation's project partner and site managers of the surveyed areas. The ethical principles cover the following responses in this research:

1. Justification for methodology selection and how ethical concerns will be handled is not an issue since participants are volunteering to give information within their free schedules.
2. Participants in this study will not be exposed to any higher physical or psychological risk than they do in their daily lives. Participants are free to drop out at any time. Topics related to environment and history, particularly those involving climate change, may elicit strong feelings. Emotional support resources will be made available if the need arises.
3. The study will not disclose the identity of persons who were previously unknown, such as online survey respondents or those who participated in other visual or verbal methods. The original consent forms will clearly state that in the process of data gathering, participants have the right to request for it to be deleted at any time. And ensure they know they can drop out freely at any time without compromising the researcher's activity.

### **(d). Risk assessment**

The research will consider any physical and psychological risks to safeguard the privacy of participants. In view of this, a risk assessment plan will be developed to identify foreseeable hazards, minimize risks, and encourage a safe working environment for the researcher and involved participants. The below risk assessment template (FORM RA4022) was obtained from the School of Geography, University of Nottingham. (UoN Moodle, n.d.)

<b>HAZARD</b>	<b>WHO MIGHT BE HARMED?</b>	<b>IS THE RISK ADEQUATELY CONTROLLED?</b>	<b>WHAT FURTHER ACTION IS NECESSARY TO CONTROL THE RISK?</b>
Identify the hazards which could reasonably be expected to result in significant harm	Identify individuals or groups of students and/or other people doing similar work or sharing the field course work space who might be affected by the field course activities	Have you already taken precautions against the risks from the hazards you have listed e.g. adequate information, training and safe work systems? Do the precautions meet legal standards, represent good practice, reduce risk as far as reasonably practical. If so list the precautions in place.	What more can you reasonably do to mitigate those risks which you found were not adequately covered? Try thinking along the following lines: <ul style="list-style-type: none"> <li>- Remove the risk completely</li> <li>- Suggest a less risky option</li> <li>- Prevent access to the hazard</li> <li>- Organise work to reduce exposure to the hazard</li> <li>- Obtain protective equipment etc.</li> </ul>
LIST HAZARDS BELOW:	LIST PEOPLE AT RISK FROM IDENTIFIED HAZARDS:	LIST EXISTING CONTROLS OR NOTE WHERE SAFETY INFORMATION MAY BE FOUND	LIST THE RISKS WHICH ARE NOT ADEQUATELY CONTROLLED AND THE ACTION/S YOU WILL TAKE WHERE IT IS REASONABLY PRACTICAL TO DO MORE
1. Interviews abuse/attack	Myself	Questionnaires will be administered to participants in the local communities. I will adhere to the fact that not everyone would like to participate in this research, and should understand people who refuse to complete the questionnaire.	I will notify each site manager of the amount of time I would spend at their sites and report back to him when the day's activity is over.
2. Transport (Trains and bus)	Myself	My mode of travel from Nottingham to my study areas would be via train always and commute to arrival points by bus.	Careful attention will be committed at train stations and stand 10m away from train stops
3. Hotel Stay & Security	Myself	At times I would not finish tasks on time or will have to continue to work the next day, arrangements will be made to lodge in nearby hotels.	I will communicate with site managers to know about secured accommodation and the route path I should be heading towards whenever I am late at study areas. Area maps will be requested to guide my movements.
4. Heat/Sun Stroke	Myself	Wear a hat and lighter attire to minimise heat absorption on my skin. Drink more water.	Lookout for shades when interviewing participants to avoid stress and loss of focus.
5. Interview locations	Myself	The location of buildings I will conduct my interviews will be critically mapped and saved address on my phone.	I will share every location detail with my best friend whom I can press the

			emergency dial whenever there is an attempt of kidnapping or abuse.
6. Covid 19	Myself	<p>The UK government's Covid-19 guidelines during the data collection stage should be adhered to and observed. This can be found in the link below:  <a href="https://www.gov.uk/guidance/local-covid-alert-level-high">https://www.gov.uk/guidance/local-covid-alert-level-high</a></p> <p>Even though the recorded cases of covid-19 have reduced drastically, I will still make sure social distancing is observed at interview times with participants. I will carry along my personal sanitizer and practice frequent hand washing always. Face masked will be provided as well.</p>	<p>Before meeting with participants, messages would be sent across to ask if any of them is having covid-19 symptoms.</p> <p>If I detect covid-19 signs myself, I will test and seek further treatment afterwards when I test positive. Communication will be relayed to the gatekeeper to hold on to project schedules.</p>

**EQUIPMENT REQUIREMENTS ARISING FROM RISK ASSESSMENT**

<b>GENERAL SAFETY EQUIPMENT (BOTH DEPARTMENTAL AND PERSONAL i.e. that which students must supply themselves)</b>	<b>COMMUNICATIONS EQUIPMENT</b>	<b>FIRST AID KITS (NUMBERS AND ANY SPECIAL REQUIREMENTS)</b>
Sun Hat Water Energy drinks	<p>There is a good network signal at Cromford and Belper. I have not visited the other study areas yet so I can not tell how strong my phone signals would be.</p> <p>My mobile number is 07871049503            Bright Bimpong Anim (best friend) 07756571306            Steve Martin (Project partner) 07790014723</p>	None

**CONTINGENCY PLANS AND EMERGENCY PROCEDURES**

All life threatening suspicions, contact emergency service on 999

Shared locations with Bright Bimpong Anim (07756571306) at every study area I visit. He will be my first point of contact and I will call him every evening after I get home to make him aware I have completed the day's task as discussed with him before the data collection stage. The day he does not hear from me, he will contact my project partner Steve (07790014723) to enquire about my whereabouts from him since he lives in the local area and might have known my route from any of the site's managers. The moment Bright does not hear from either me or Steve, he will quickly contact emergency service. That would be the final tracing plan.



## **(5). EXPECTED RESEARCH OUTCOME**

This project seeks to support documentation and research of the Derwent Valley heritage sites to address the connection of the three fundamentals of sustainable development (economic development, social inclusion and environmental protection (UN, n.d.), and explore threats associated with climate change.

- It will inform future management of at-risk heritage properties and look into the economic business models from the interview question on comparing pre and post covid-19 analysis. This data will be built to follow up on the sustainable tourism inputs of the Derwent Valley area. (DVMWHS, 2019).
- The research is expected to ignite the community passion activism that connects locals to their historic assets, people and the environment; and build the capacity they serve to develop the agenda 2030.
- The researcher will act as an evaluator of the progress of the Sustainable Development Goals by talking to people engaging at the sites.

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