heritact

IMPACT ASSESSMENT AND VALIDATION HANDBOOK

D6.1

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Deliverable

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HeritACT	**101094998**	**Heritage Activation Through Engaging Experiences Towards Sustainable Development**

DELIVERABLE REFERENCE NUMBER AND TITLE

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Impact Assessment and Validation Handbook

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Statement of Originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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Summary

Context, Methodology and Goal

The present Deliverable 6.1, under the title **"Impact assessment and Validation Handbook"** constitutes the result of the work carried out in the context of Task 6.1 **"Impact Assessment and Validation Framework" of Work Package 6 "Impact assessment, Guidelines & Recommendations".** As laid out in the Grant Agreement (GA) of the HeritACT Project, the Deliverable aims to:

- Develop an impact assessment and validation framework that will provide a list of representative indicators and processes to monitor the project intervention success during the demonstration activities and impact thereafter.

It reports on the activities completed in the associated Task, whose stated goals the definition of an Impact Assessment and Validation Framework [IAVF] adopted for developing impact indicators and calculating impacts. The framework will attempt to provide the preliminary analysis for a results-based approach, including

- Reference for monitoring of the implementation based on the generation of outputs, validation of the resulting outputs, and assessment of broader social, economic and environmental outcomes and impacts.
- Resources for mapping indicators to monitor the project intervention success during the demonstration activities and impact thereafter.
- This methodology will guide all activities of T6.2, T6.3 and T6.4 through the delivery of a handbook that will be used the relevant partners to carry out validation, evaluation and impact assessment activities.

Consequently, the Deliverable is structured into 3 Chapters.

- **1 – Context**
  Maps out the broader frames of reference for situating the Impact Assessment Framework
- **2 – Impact Assessment Methodology**
  Provides the framework for Assessment and Validation
- **3 – HeritACT IAVF Outline**
  Steps and related information that articulate the proposed framework.

The results regarding the Impact Assessment Framework as well as avenues of future research are discussed in the conclusions. The present Deliverable aims to act as a mapping tool – providing the frames of reference on which the following activities of the WP can build. This ongoing process means in turn that the results presented here will in

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turn be revised, expanded and elaborated based on future information and research produced in the broader context of the HeritACT project.

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1 / Context

This Chapter will attempt to map out the goals of broader Frameworks and initiatives in which the HeritACT Project is situated. Apart from the HeritACT Project objectives, the chosen frameworks to be considered in this context are:

- The HeritACT Project Objectives
- The United Nations Sustainable Development Goals (SDGs)
- The European Green Deal (EGD)
- The New European Bauhaus (NEB)

For each of these a brief overview and analysis of the stated goals will be made as well as a collation of the main objectives in the related tables. The results will provide a broad framework in which to begin situating the Impact Assessment Framework.

The structure of the Chapter is as follows.

A recapitulation of the HeritACT Project Objectives, as laid out in the Grant Agreement will provide the foundation for mapping out the main goals of the project. This will be followed by a brief overview of the broader frameworks (SDG, EGD, NEB). Finally, the chapter will conclude with a brief discussion on the objectives and goals that the project's Impact Assessment Framework can evaluate.

1.1 HeritACT Objectives

1.1.1 Overview

The HeritACT Project goals, as laid out in the proposal and reiterated in the Grant Agreement are categorised in nine main objectives as follows:

1. Promote a European Perspective on Cultural Heritage as a Driver for Sustainable Development and wellbeing.
2. Building future on local heritage by emplacing architecture into the practice of inclusive placemaking.
3. Activate Heritage through the creation and promotion of HeriTHUBS, that will act as hubs of culture, innovation, and education, that trigger inclusive and social interactions through the participation and collaboration among citizens, cultural and creative industries, and local stakeholders.
4. Enhance people's creativity driven participatory processes and inclusiveness during and beyond the transformation of spaces through cutting-edge technologies.

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5. Design for the experience-driven life by re-thinking and re-inventing how people experience aspects of their lives and the places and spaces that they live in.
6. Foster the co-creation of heritage reactivation to preserve ecosystems and promote a better understanding of relations between nature and architecture through a set of archetypal innovative solutions and demonstrations in line with the European Green Deal.
7. Boost the use of new recycled and green materials, innovative digital manufacturing technologies and new forms based on data analysis and computation for the development of heritage reactivation solutions involving experts from the world of science, technology, art and culture.
8. Leverage the power of creativity and innovation by architects, designers, artists, and new talents increasing their visibility and recognition within events and festivals activating the heritage network.
9. Develop new cost-efficient and sustainable guidelines and recommendations in line with NEB principles through Heritage prism and promote the HeritACT results through European clusters and networking.

The following subsections will present the HeritACT objectives by briefly elaborating on their description as set out in the proposal and identifying salient points pertinent to the objectives of the present chapter,

1.1.2 HERITACT Objective 1

Promote a European Perspective on Cultural Heritage as a Driver for Sustainable Development and wellbeing.

The first objective stresses the importance of applying “systems thinking” to design processes and outcomes. This differs from normal practice that tends to design objects in isolation - and thus not adequately addressing the multiple interconnections that frame and define a design problem. Through the proposed holistic approach, the stated aim is to “integrate natural and human systems” and mobilise them towards meeting the Sustainable Development Goals (SDGs). A key role in this will be played by the development of a Toolkit that will:

- Enable the effective and localised implementation of SDGs.
- Reveal unrecognised opportunities of utilising Cultural Heritage to maximise co benefits and synergies.
- Manage inevitable trade-offs and support decision making.

These goals will in turn assist in building “more economically, socially, and environmentally sustainable and equitable cities”. The specific KPIs set forth in the context of the objective are:

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1. Number of developed tools for SDGs implementation
2. Number of developed tools

1.1.3 HERITACT Objective 2

Building future on local heritage by emplacing architecture into the practice of inclusive placemaking.

The second objective of the HeritACT project highlights placemaking in the context of local cultural heritage. It aims to reposition architectural and space design practices from limited expert knowledge to a broader and more inclusive approach. In this sense it shares the same holistic approach set out in Objective 1, but in this case the focus is on existing structures and spaces. Thus, this objective aims to utilise cultural heritage sites to:

- Strengthen the sense of belonging.
- Integrate urban cultures, spiritual and emotional contexts connected to specific spaces.

These will enable the cultural heritage structures and space to provide a sense of continuity, comprehensibility, and coherence to communities. The specific KPIs linked to this objective are:

1. Number of heritage sites reactivated.
2. Number of participants in the reactivation process

1.1.4 HERITACT Objective 3

Activate Heritage through the creation and promotion of HERITHUBS, that will act as hubs of culture, innovation and education, that trigger inclusive and social interactions through the participation and collaboration among citizens, cultural and creative industries, and local stakeholders.

The third objective set out in the project proposal refers to a specific initiative centred around the creation of HeritHUBS. These will be utilised as focal points for the various activities of the HeritACT Project as well as playing an integral role in the outreach and visibility strategies. Three typologies are defined:

- Place HeritHUBS - that will enhance stakeholders' contribution to the design and planning process of public open spaces, increase social and cultural interactions among neighbourhoods and bring the community closer to the HERITAGE network.
- Portable HeritHUBS - which will act as cultural satellites to host activities and events, modified to reflect the values, cultures, history and visions of each community.

- Digital HeritHUBS - which will consist of a digital platform, acting as multilevel and multidimensional hub, will be developed to connect, exchange, and share best practices across Europe.

The HeritHUBS aim to stand as a manifesto of the reactivation strategy while at the same time hosting and contributing to thematic workshops, educational and awareness activities as well as other initiatives planned in the context of the project. The specific KPIs linked to this objective are:

1. Number of HeritHUBS activated.
2. Number of actions and practices identified for HeritHUBS activation.
3. Number of community locations activated.

Number of participants on European level.

1.1.5 HERITACT Objective 4

Enhance people's creativity driven participatory processes and inclusiveness during and beyond the transformation of spaces through cutting-edge technologies.

Objective number four revisits the tools referenced in Objective 1, introducing a new dimension, namely “the participation of an enlarged audience, especially those often excluded from such processes”. This includes young people and children, senior citizens, people with disabilities and other social groups that are often excluded from processes of co-design and co-creation. The tools aim to:

- Stimulate participants’ creativity and to enhance their experience in the participatory activities.
- Enable micro (neighbourhoods), meso (cities) and macro (countries) scale collaborative synergies.

In order to achieve this, a spectrum of methodologies and tools will be utilised, including the merging of physical and virtual spaces, gamification approaches etc. The specific KPIs linked to this objective are:

1. Number of tools developed.
2. Number of people testing the tools.
3. Number of people at risk of exclusion testing the tools.
4. Number of people with disabilities testing the tools.

1.1.6 HERITACT Objective 5

Design for the experience-driven life by re-thinking and re-inventing how people experience aspects of their lives and the places and spaces that they live in.

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Expanding on the participatory aspect laid out in previous objectives, the fifth objective of the HeritACT Project specifies the development of "a set of user experience measurement protocols and methods" that will assist in the monitoring of the project's activities. The aspect of accessibility - i.e., representing within these frameworks the input from groups such as people with different sensory needs and expectations or nonnative speakers is particularly highlighted. The specific objective aims to combine psychophysiological measures with activity logs and subjective data to :

- Produce more reliable outcomes during the development of prototypes.
- Evaluate and guide their design.
- Provide continuous feedback on the effectiveness and aesthetic of the prototypes.

Furthermore, the developed protocols and methods, following a design-for-all approach, will substantially increase "the level of accessibility to the experience-driven life" and aims to include a wide range of people. The specific KPIs linked to this objective are:

1. Increase perception level of the implemented solutions through AR/VR elements and soundscapes.
2. Increase of diversity of groups (different ethnic, cultural, social backgrounds and gender) participating in the design process.
3. Number. of people with disabilities and other needs included in participatory/experience process.

1.1.7 HERITACT Objective 6

Foster the co-creation of heritage reactivation to preserve ecosystems and promote a better understanding of relations between nature and architecture through a set of archetypal innovative solutions and demonstrations in line with the European Green Deal.

The sixth objective of the project specifies a series of archetypal solutions, including Nature Based Solutions that will explore ways to implement the European Green Deal (EGD) and New European Bauhaus (NEB) principles in the reactivation of cultural heritage sites. Furthermore, it is specified that local communities will be actively engaged in the development and implementation of these solutions to raise awareness about EGD and NEB. Moreover, it is important that these solutions incorporate replicability, in order to provide a template for reactivating other heritage networks. These solutions aim to accelerate research, knowledge transfer and market uptake of

- Novel renewable and sustainable nature-based materials.

- Structural components and envelope systems.

Through these it is expected to create significant opportunities for increasing circularity and decarbonization in the building sector. The specific KPIs linked to this objective are:

1. Number of HERITACT small-scale NBS solutions (pollinator gardens, rain gardens, pocket forests, ground-based vertical green etc.) co-designed.
2. Number of people/actors involved in the co-design.

1.1.8 HERITACT Objective 7

Boost the use of new recycled and green materials, innovative digital manufacturing technologies and new forms based on data analysis and computation for the development of heritage reactivation solutions involving experts from the world of science, technology, art and culture.

Objective number seven introduces the concept of digital manufacturing, combined with the deployment of computational data analysis and design tools and utilisation of recycling and upcycling fabrication materials. These methods and tools will be leveraged in order to co create innovative solutions and products that will address people's needs and desires. Specific steps are identified, including:

- Using data (e.g., environmental data) and algorithms as computational inputs of parametric design processes.
- Involvement of a multidisciplinary team of people.
- Generation of new forms inspired by other scientific and artistic fields.

Ultimately - these design methodologies, coupled with the extensive use of waste as source material for advanced manufacturing techniques aims at achieving “solutions made by new and innovative materials and with forms tailored to people's aesthetic taste.”. The specific KPIs linked to this objective are:

1. Number of solutions co-created using new materials.
2. Number of solutions co-created using new technologies.
3. Number of solutions co-created with new forms.

1.1.9 HERITACT Objective 8

Leverage the power of creativity and innovation by architects, designers, artists, and new talents increasing their visibility and recognition within events and festivals activating the heritage network.

The eighth objective focuses on increasing the visibility and recognition of design and artistic professions active within the broader context of the HeritACT project (i.e. architects, designers, artists etc). This will also facilitate the alignment between the

Cultural and Creative Industries (CCI) with the broader communities, fostering participation and engagement. Specific actions will include:

- Development of a system for decentralised funding of arts and cultural activities.
- Organisation and support of events such exhibitions, workshops, performances, festivals etc.

The main goal of the objective is to support artists creativity, recognition, and empowerment. The specific KPIs linked to this objective are:

1. Number of events organised.
2. Number of architects, designers and artists promoted in the project and participating in public events.
3. Number of artists crowdfunded.
4. Amount secured from crowdfunding.

1.1.10 HERITACT Objective 9

Develop new cost-efficient and sustainable guidelines and recommendations in line with NEB principles through Heritage prism and promote the HERITACT results through European clusters and networking.

The final objective listed in the HeritACT Project's Grant Agreement focuses on the critical analysis and evaluation of the outcomes of the activities described and identification of lessons learned. Furthermore, keeping in mind the scalability of the proposed solutions "potential barriers for the replication of the HERITACT approach in other EU heritage networks will be studied". This objective will be achieved through extensive participatory processes, including "citizens, scientific and artistic communities, civil associations, and public bodies participating in the project". TH objective aims at developing a robust and well-structured Performance Assessment Framework including KPIS for

- Environmental.
- Economic.
- Aesthetic.
- Social impacts.

The set of guidelines and recommendations produced will include Life Cycle Analysis and other sustainability best practices. These can be utilized to support other initiatives taking place in the context of the NEB, as well as transfer emerging concepts and ideas to other stakeholders on a local, regional, national and European level. The specific KPIs linked to this objective are:

1. Number of other European heritage networks identified for replication.

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2. Number of guidelines.
3. Number of collaborations with other projects.

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1.1.11. Collected Data

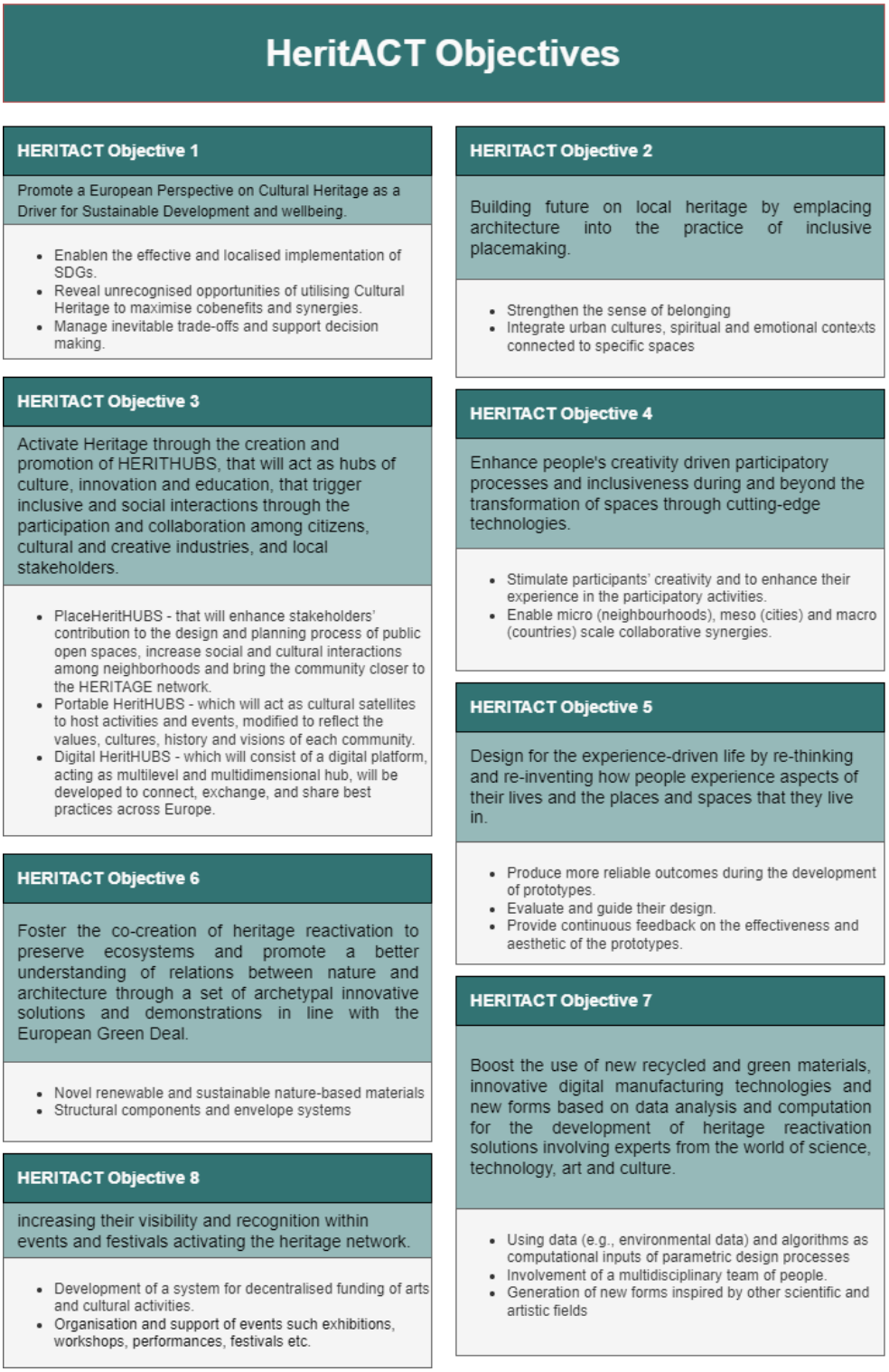

Figure 1. HeritACT Objectives.

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1.2 UN Sustainable Development Goals

1.2.1 Overview

In the context of the stated HeritACT objectives - the broader frame of reference is the Sustainable Development Goals (SDGs) as adopted by the United Nations in 2015. These consist of 17 action areas that constitute a "universal call to action to end poverty, protect the planet and ensure that by 2030 all people enjoy peace and prosperity". Two additional points highlighted in the SDGs statement are of special interest.

The first is that the 17 SDGs are interconnected, that is to say that actions and initiatives in one area resonate across all the goals to some extent, and consequently achieving the SDGs calls for a holistic rather than a reductionist approach. Furthermore, this indicates that the impacts of activities need to be assessed on two levels. Firstly, on an immediate level, in the context of the specific goal and objective addressed. Secondly through the identification and mapping of secondary impacts that may not be immediately connected to the objective or goal in question. This suggests that the produced assessment framework should consider a web of interconnected impacts rather than a serial checklist.

The second point that can be gleaned from the SDG statement of intent is the special mention of the necessity to enlist "the creativity, knowhow, technology and financial resources from all of society" in order to be able to achieve the stated goals. In the context of the HeritACT Project this can be translated as the important role that interdisciplinarity as well as inclusivity will play in the fulfilment of the project's objectives. Furthermore, the specific mention of creativity and technology validate the philosophy of the project that aims to engage the creative industries along with the development and deployment of innovative technologies and suggest that a main area for assessing the impact of the HeritACT Project is the integration of these elements in the activities as well as the reciprocal relation. In other words, how creative methodologies and technological tools affect the project outcomes and conversely what feedback can the project's activities provide to the fostering of new creative approaches and innovative technological developments.

Moving forward from the general statement of intent regarding the SDGs, the following subsections will consist of an overview of each of the 17 goals coupled with a brief analysis of their relation to the project and specifically the Impact Assessment Framework considered in the present document. As a conclusion, a table collecting

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these goals and proposing a categorization based on their relation to the HeritACT Project's approach. The 17 SDGs as laid out by the United Nations are the following:

1. No Poverty
2. Zero Hunger
3. Good Health and Well-Being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice and Strong Institutions
17. Partnership for the Goals

1.2.2 SDG 01: No Poverty

Regarding poverty, the eradication of which "remains one of the greatest challenges facing humanity" - the SDG description on one hand lists the advances made over the last 25 years ("the number of people living in extreme poverty has halved") and on the other hand warns that there remain "about 736 million people ... [living] on less than US$1.90 a day") and lack access to basic resources such as "food, clean drinking water and sanitation". Furthermore, the report stresses that

- Poverty disproportionately affects women and particular regions of the world.
- New threats such as climate change exacerbate the situation.

The SDG aims at ending "poverty in all forms and dimensions by 2030." and makes special mention to targeting the most vulnerable members of the population, improving access to basic amenities, and tackling climate related challenges.

The targets set by the No Poverty SDG are:

- By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.
- Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable

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- By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.
- By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.
- Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions.
- Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions.

1.2.3 SDG 02: Zero Hunger

As with the previous SDG, the outline of intent highlights the progress made in the past years in combating undernourishment globally ("The number of undernourished people has dropped by almost half in the past two decades") while at the same time highlighting the huge challenge that it still represents (are 821 million people estimated to be chronically undernourished as of 2017...Over 90 million children under five are dangerously underweight").

Aligning also with the goal to eliminate poverty, the Zero Hunger SDG sets the optimistic objective to end all forms of hunger and malnutrition by 2030. In this context, it highlights.

- Sustainable agriculture
- Integration of technology

to improve productivity in a sustainable manner.

The targets set for the Zero Hunger SDG are:

- By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.
- By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land,

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other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.

- By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.
- By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilisation of genetic resources and associated traditional knowledge, as internationally agreed.
- Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks to enhance agricultural productive capacity in developing countries, in particular least developed countries.
- Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round
- Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.

1.2.4 SDG 03: Good Health and Well-being

The SDG focusing on the Good Health and Well-being highlights the link between sustainable development and good health. Although progress has been made in increasing global life expectancy, reducing infant and maternal mortality and combatting the impact of diseases and other leading causes of death – global good health remains a challenging field for the international community.

The outline of the SDG cites:

- Widening economic and social inequalities
- Acceleration of global trends such as rapid urbanization
- Emergence of new challenges related to climate change.

as some of the factors that contribute to the fact that “the world is off-track to achieve the health-related SDGs”. The inequality inherent in progresses achieved in the health field is also illustrated: “There’s a 31-year gap between the countries with

the shortest and longest life expectancies.", and by specifically mentioning that "national averages hide that many are being left behind", making imperative the need for inclusive, multisectoral approaches to address these inequalities and ensure good health for all.

The targets set by the Good Health and Well-being SDG are:

- By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births.
- By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births.
- By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.
- By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.
- Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.
- By 2020, halve the number of global deaths and injuries from road traffic accidents.
- By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes.
- Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.

1.2.5 SDG 04: Quality Education

The SDG states that "Achieving inclusive and quality education for all reaffirms the belief that education is one of the most powerful and proven vehicles for sustainable development". This goal's main objective is to ensure that by 2030, all children complete free primary and secondary education. Furthermore, specific mention is made to the need to ensure that equal and universal access to affordable vocational training and higher education is provided and to combat inequalities in access to education related to social or economic reasons.

The SDG's outline also notes that great progress has been made in the field, citing the fact that the number of children out of school has halved and the enrolment rats in developing regions has reached 91% over the 15 years since 2000. Other notable

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advances include the increase in literacy rates and the increasing number of girls that have access to education. Nevertheless,

- Ongoing crises such as climate change, armed conflicts, and economic issues have an adverse effect in achieving the stated targets.
- “Children from the poorest households are up to four times more likely to be out of school than those of the richest households”.
- There remain large disparities between rural and urban regions.

The targets set by the Quality Education SDG are:

- By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and Goal-4 effective learning outcomes.
- By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education.
- By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.
- By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.
- By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations.
- By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy.
- By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development.
- Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all.
- By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology,

technical, engineering and scientific programmes, in developed countries and other developing countries.
- By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing states.

1.2.6 SDG 05: Gender Equality

The eradication of discrimination against women and girls is a basic human right and furthermore an essential goal to ensure a sustainable future. The SDG highlights the fact that the empowerment of women and girls significantly "helps economic growth and development".

As per the previous SDGs, the introduction for SDG 05 outlines the progress has been made in the field of gender equality, including greater percentage of women in the labour market as well as better access to education for girls. Nevertheless, serious inequalities remain in multiple fields. These include:

- Work rights.
- Sexual violence and discrimination.
- Unequal division of unpaid care and domestic work.
- Discrimination in public office.
- Disproportionately affected by climate change, disasters, conflict, and migration.

The SDG description stresses that "It is vital to give women equal rights land and property, sexual and reproductive health, and to technology and the internet."

The targets set by the Gender Equality SDG are:

- End all forms of discrimination against all women and girls everywhere.
- Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation.
- Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation.
- Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.
- Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision making in political, economic and public life.

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- Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences.
- Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws.
- Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.
- Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.

1.2.7 SDG 06: Clean Water and Sanitation

The goal of ensuring safe and affordable drinking water as well as access to basic sanitation services remains a huge challenge, given the fact that it entails “reaching 800 million people who lack basic services and improving accessibility and safety of services for over two billion.” as well as addressing the needs of 2.3 billion that lack basic sanitation and 4.5 billion that lack access to safely managed sanitation services. To address these alarming figures, investment in multiple areas is required, including:

- Adequate infrastructure.
- Provision of sanitation facilities.
- Encouragement of hygiene.
- Protection and restoration of water related ecosystems.

Given the fact that water scarcity affects more than 40 percent of the global population, and this is projected to rise because of climate change. The specific SDG stresses the emergency of the situation highlighting that “By 2050, it is projected that at least one in four people will suffer recurring water shortages.”

The targets set by the Clean Water and Sanitation SDG are:

- By 2030, achieve universal and equitable access to safe and affordable drinking water for all.
- By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.
- By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the

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proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

- By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.
- By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.
- By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.
- By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.
- Support and strengthen the participation of local communities in improving water and sanitation management.

1.2.8 SDG 07: Affordable and Clean Energy

As the global population continues to grow so does the demand for energy. Although in the last 18 years the "number of people with electricity increased from 78 to 90 percent" the fact that this is achieved in the context of an economy reliant on fossil fuels has drastically affected the climate. In this context the need to shift towards clean energy becomes imperative. This includes actions that

- Invest in solar, wind and thermal power.
- Improve energy productivity.
- Ensure energy for all.

SDG 07 main objective is to expand infrastructure and upgrade technology to provide cleaner and more efficient energy to all countries. This in turn will foster growth while also addressing the challenges facing the environment because of climate change.

The targets set by the Affordable and Clean Energy SDG are:

- By 2030, ensure universal access to affordable, reliable and modern energy services.
- By 2030, increase substantially the share of renewable energy in the global energy mix.
- By 2030, double the global rate of improvement in energy efficiency.
- By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy

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efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.
- By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries.

1.2.9 SDG 08: Decent Work and Economic Growth

The SDG related to "Decent Work and Economic Growth" prioritizes the improvement of the condition of the global workforce. Extreme poverty among workers has declined over the past 25 years, leading to a significant expansion of the middle-class workers as a percentage of total employment in developing countries. Nevertheless, the outline of SDG 08 highlights that "as the global economy continues to recover, we are seeing slower growth, widening inequalities, and not enough jobs to keep up with a growing labour force". To combat these trends proposed actions include:

- Encouraging entrepreneurship and job creation,
- Effective measures to eradicate forced labour, slavery and human trafficking.

These will help achieve the SDG's overall objective, namely the provision of "full and productive employment, and decent work, for all women and men by 2030" promoting sustained economic growth, higher levels of productivity and technological innovation.

The targets set by the Decent Work and Economic Growth SDG are:

- Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries.
- Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high value added and labour-intensive sectors.
- Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services.
- Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead.

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- By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.
- By 2020, substantially reduce the proportion of youth not in employment, education or training.
- Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms.
- Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.
- By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products.
- Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all.
- Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-Related Technical Assistance to Least Developed Countries.
- By 2020, develop and operationalize a global strategy for youth employment and implement the Global Jobs Pact of the International Labour Organization.

1.2.10 SDG 09: Industry, Innovation and Infrastructure

To promote economic growth and development, SDG 09 identifies infrastructure and innovation as fields where investment is required. This resonates across multiple levels such as the urban environment, energy production, information and communication technologies and the development of new industries. Furthermore, “technological progress is also key to finding lasting solutions to both economic and environmental challenges” and to facilitate sustainable development. These solutions include:

- Providing new jobs.
- Promoting energy efficiency.
- Promoting sustainable industries.
- Investing in scientific research and innovation.

Keeping in mind that “more than 4 billion people still do not have access to the Internet” the SDG furthermore underlines the need to bridge the “Digital Divide” and ensure “equal access to information and knowledge” to all.

The targets set by the Industry, Innovation and Infrastructure SDG are:

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- Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.
- Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries.
- Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets.
- By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.
- Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.
- Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States.
- Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities.
- Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.

1.2.11 SDG 10: Reduced Inequalities

The worrying fact that inequality is on the rise globally, SDG 10 highlights the need for "sound policies to empower lower income earners, and promote economic inclusion of all regardless of sex, race or ethnicity." Global solutions are required, involving:

- Improving the regulation and monitoring of financial markets and institutions,
- Encouraging development assistance and foreign direct investment to regions where the need is greatest.
- Facilitating the safe migration and mobility of people

Immediate action on multiple levels is required to bridge the "widening divide".

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The targets set by the Reduced Inequalities SDG are:

- By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average.
- By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.
- Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard.
- Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality.
- Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations.
- Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions.
- Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies.
- Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements.
- Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes.
- By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent.

1.2.12 SDG 11: Sustainable Cities and Communities

The rapid growth of cities globally has led to a “boom in megacities”. Given the fact that by 2050, 2/3 of the global population will live in urban environments, a significant transformation in “the way we build and manage our urban spaces” is required. Making cities sustainable means:

- Creating career and business opportunities.
- Safe and affordable housing.
- Building resilient societies and economies.

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- Investment in public transport.
- Creating green public spaces.
- Improving urban planning and management in participatory and inclusive ways.

The improvement of urban life, through the amelioration of the urban environment is thus identified as a prerequisite for sustainable development and growth.

The targets set by the Sustainable Cities and Communities SDG are:

- By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.
- By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.
- By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.
- Strengthen efforts to protect and safeguard the world's cultural and natural heritage.
- By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.
- By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.
- By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.
- Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning.
- By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels.

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- Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials.

1.2.13 SDG 12: Responsible Consumption and Production

The urgent need to reduce our ecological footprint necessitates a bold paradigm shift in "the way we produce and consume goods". Important targets to achieve this goal include:

- The efficient management of our shared natural resources.
- Addressing the way, we dispose of toxic waste and pollutants.
- Encouraging industries, businesses and consumers to recycle and reduce waste is equally important.
- Supporting developing countries to move towards more sustainable patterns of consumption by 2030.

The creation of efficient production and supply chains by reducing global food waste at consumer and retailer levels "can help with food security and shift us towards a more resource efficient economy".

The targets set by the Responsible Consumption and Production SDG are:

- Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries.
- By 2030, achieve the sustainable management and efficient use of natural resources.
- By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.
- By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.
- By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.
- Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

- Promote public procurement practices that are sustainable, in accordance with national policies and priorities.
- By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.
- Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production.
- Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.
- Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities.

1.2.14 SDG 13: Climate Action

The effects of global warming are the cause of "long-lasting changes to our climate system, which threatens irreversible consequences if we do not act". The impacts of climate change affect all countries globally. Moreover, related metrics are alarming with the estimation of "the annual average economic losses from climate-related disasters are in the hundreds of billions of dollars". Furthermore, the human cost of "geo-physical disasters, which are 91 percent climate-related" is estimated at 1.3 million killed and 4.4 billion injured since 1998. In order to address the ongoing crisis, national development strategies need to adapt to climate change while also promote low-carbon development. This entails integrating:

- Supporting vulnerable regions
- Disaster risk measures.
- Sustainable natural resource management.
- Human security.
- Supporting vulnerable regions

The SDG reiterates that "It is still possible, with strong political will, increased investment, and using existing technology, to limit the increase in global mean temperature to two degrees Celsius above pre-industrial levels, aiming at 1.5°C, but this requires urgent and ambitious collective action."

The targets set by the Climate Action SDG are:

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- Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
- Integrate climate change measures into national policies, strategies and planning.
- Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
- Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.
- Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

1.2.15 SDG 14: Life Below Water

The world's oceans are a vital resource "essential for humanity as a whole, and to counterbalance the effects of climate change". They drive global climate systems that "make the Earth habitable for humankind". Consequently, their management is of paramount importance, especially when we consider that the livelihood of "over three billion people depends on marine and coastal biodiversity". The Life Below Water SDF aims to mitigate some of the challenges facing our oceans by:

- Sustainably managing and protecting marine and coastal ecosystems from pollution.
- Addressing the impacts of ocean acidification.
- Enhancing conservation and the sustainable use of ocean-based resources through international law.

It is also important to note that in the context of climate change "Marine pollution, an overwhelming majority of which comes from land-based sources, is reaching alarming levels" which illustrates the need for immediate action.

The targets set by the Life Below Water SDG are:

- By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.

- By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.
- Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.
- By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.
- By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.
- By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation.
- By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.
- Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.
- Provide access for small-scale artisanal fishers to marine resources and markets.
- Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of The Future We Want.

1.2.16 SDG 15: Life on Land

Natural habitats on land and biodiversity are “are part of our common heritage and support global food and water security, climate change mitigation and adaptation, and peace and security.”. In this context they are crucial to human life as we know it.

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- Plant life provides 80 percent of the human diet.
- We rely on agriculture as an important economic resource.
- Natural systems are important sources for clean air and water as well as being crucial for combating climate change.

Despite protection and preservation initiatives, biodiversity is still at risk while natural ecosystems are being lost at an alarming rate, disproportionately affecting poor communities.

Every year, 13 million hectares of forests are lost, while the persistent degradation of drylands has led to the desertification of 3.6 billion hectares, disproportionately affecting poor communities. This highlights the need for urgent action to reduce and reverse these trends.

The targets set by the Life on Land SDG are:

- By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.
- By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.
- By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.
- By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.
- Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.
- Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed.
- Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products.
- By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species.

- By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts.
- Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems.
- Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.
- Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities.

1.2.17 SDG 16: Peace, Justice and Strong Institutions

The introduction to the 16th SDG states that "We cannot hope for sustainable development without peace, stability, human rights and effective governance, based on the rule of law.". The addressing of the global inequalities in this context include:

- Significantly reducing all forms of violence
- Working with governments and communities to end conflict and insecurity.
- Promoting the rule of law and human rights
- Reducing the flow of illicit arms

Strengthening the participation of developing countries in the institutions of global governance.

Furthermore, "countries must take measures to protect those who are most at risk" from the consequences of insecurity, conflict and violence.

The targets set by the Peace, Justice and Strong Institutions SDG are:

- Significantly reduce all forms of violence and related death rates everywhere.
- End abuse, exploitation, trafficking and all forms of violence against and torture of children.
- Promote the rule of law at the national and international levels and ensure equal access to justice for all.
- By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime.
- Substantially reduce corruption and bribery in all their forms.
- Develop effective, accountable and transparent institutions at all levels.
- Ensure responsive, inclusive, participatory and representative decision-making at all levels.
- Broaden and strengthen the participation of developing countries in the institutions of global governance.

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- By 2030, provide legal identity for all, including birth registration.
- Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements.
- Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime.
- Promote and enforce non-discriminatory laws and policies for sustainable development.

1.2.18 SDG 17: Partnership for the Goals

The interconnected nature of todays globalized world makes it clear that "The SDGs can only be realized with strong global partnerships and cooperation.". In this context, it is important to

- Improve access to technology and knowledge as an important way to share ideas and foster innovation.
- Coordinate policies to help developing countries manage their debt, as well as promoting investment for the least developed.

These initiatives are "vital for sustainable growth and development." And will foster global cooperation towards achieving a "a universal rules-based and equitable trading system that is fair and open and benefits all."

The targets set by the Partnership for the Goals SDG are divided into Sections:

Finance

- Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection.
- Developed countries to implement fully their official development assistance commitments, including the commitment by many developed countries to achieve the target of 0.7 per cent of ODA/GNI to developing countries and 0.15 to 0.20 per cent of ODA/GNI to least developed countries ODA providers are encouraged to consider setting a target to provide at least 0.20 per cent of ODA/GNI to least developed countries.
- Mobilize additional financial resources for developing countries from multiple sources.
- Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress.

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- Adopt and implement investment promotion regimes for least developed countries.

Technology

- Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism.
- Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.
- Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology

Capacity building

- Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation.

Trade

- Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda.
- Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020.
- Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries, consistent with World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from least developed countries are transparent and simple, and contribute to facilitating market access.

Systemic issues

- Policy and institutional coherence.
- Enhance global macroeconomic stability, including through policy coordination and policy coherence.
- Enhance policy coherence for sustainable development.

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- Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development.

Multi-stakeholder partnerships

- Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries.
- Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships.

Data, monitoring and accountability.

- By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts.
- By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries.

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1.2.19 Data Collected

UN Sustainable Development Goals
SDG 01: No Poverty
Present Situation • Poverty disproportionately affects women and particular regions of the world. • New threats such as climate change exacerbate the situation
Initiatives • Target most vulnerable members of population • Improve access to basic amenities • Tackle climate related challenges
SDG 02: Zero Hunger
Present Situation • 821 million people estimated to be chronically undernourished • 90 million children under five are dangerously underweight
Initiatives • Fostering sustainable agriculture • Integrating technological solutions
SDG 03: Good Health and Well-being
Present Situation • Widening economic and social inequalities • Acceleration of global trends such as rapid urbanization • Emergence of new challenges related to climate change
Initiatives • Increasing global life expectancy • Reducing infant and maternal mortality • Combatting the impact of diseases and other leading causes of death
SDG 04: Quality Education
Present Situation • Ongoing crises such as climate change, armed conflicts, and economic issues have an adverse effect in achieving the stated targets. • Children from the poorest households are up to four times more likely to be out of school than those of the richest households" • There remain large disparities between rural and urban regions.
Initiatives • Equal and universal access to affordable vocational training and higher education • Combat inequalities in access to education related to social or economic reasons.

Figure 2. UN SDGs 01-04.

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SDG 05: Gender Equality

Present Situation

- Work right inequalities
- Sexual violence and discrimination
- Unequal division of unpaid care and domestic work
- Discrimination in public office
- Disproportionately affected by climate change, disasters, conflict, and migration

Initiatives

- Empowerment of women and girls
- Increasing percentage of women in the labour market
- Better access to education for girls

SDG 06: Clean Water and Sanitation

Present Situation

- 800 million people who lack basic services
- 2.3 billion that lack basic sanitation
- 4.5 billion that lack access to safely managed sanitation services

Initiatives

- Adequate infrastructure.
- Provision of sanitation facilities.
- Encouragement of hygiene.

SDG 07: Affordable and Clean Energy

Present Situation

- As the global population continues to grow so does the demand for energy
- Economy reliant on fossil fuels has drastically affected the climate

Initiatives

- Invest in solar, wind and thermal power.
- Improve energy productivity.
- Ensure energy for all

SDG 08: Decent Work and Economic Growth

Present Situation

- Slower growth
- Widening inequalities
- Not enough jobs

Initiatives

- Encouraging entrepreneurship and job creation,
- Effective measures to eradicate forced labour, slavery and human trafficking.

Figure 3. UN SDGs 05-08.

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SDG 09: Industry, Innovation and Infrastructure

Present Situation

- Infrastructure and innovation as fields where investment is required
- multiple levels (urban environment, energy production, information and communication technologies and the development of new industries)
- Technological progress is also key to finding lasting solutions to both economic and environmental challenges

Initiatives

- Providing new jobs.
- Promoting energy efficiency.
- Promoting sustainable industries.
- Investing in scientific research and innovation

SDG 10: Reduced Inequalities

Present Situation

- Inequality is on the rise globally

Initiatives

- Improving the regulation and monitoring of financial markets and institutions,
- Encouraging development assistance and foreign direct investment to regions where the need is greatest.
- Facilitating the safe migration and mobility of people

SDG 11: Sustainable Cities and Communities

Present Situation

- Boom in megacities
- Growing urbanization of population
- Significant transformation in "the way we build and manage our urban spaces" is required

Initiatives

- Creating career and business opportunities.
- Safe and affordable housing.
- Building resilient societies and economies.
- Investment in public transport.
- Creating green public spaces.
- Improving urban planning and management in participatory and inclusive ways

Figure 4. UN SDGs 09-11.

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SDG 12: Responsible Consumption and Production

Present Situation

- Urgent need to reduce our ecological footprint

Initiatives

- The efficient management of our shared natural resources.
- Addressing the way we dispose of toxic waste and pollutants.
- Encouraging industries, businesses and consumers to recycle and reduce waste is equally important.
- Supporting developing countries to move towards more sustainable patterns of consumption by 2030

SDG 13: Climate Action

Present Situation

- The effects of global warming are the cause of "long-lasting changes to our climate system, which threatens irreversible consequences if we do not act".

Initiatives

- Supporting vulnerable regions
- Disaster risk measures.
- Sustainable natural resource management.
- Human security.
- Supporting vulnerable regions

SDG 14: Life Below Water

Present Situation

- Oceans are vital resource essential for humanity as a whole, and to counterbalance the effects of climate change
- Over three billion people depends on marine and coastal biodiversity

Initiatives

- Sustainably managing and protecting marine and coastal ecosystems from pollution.
- Addressing the impacts of ocean acidification.
- Enhancing conservation and the sustainable use of ocean-based resources through international law

SDG 15: Life on Land

Present Situation

- Natural habitats are part of our common heritage
- They support global food and water security, climate change mitigation and adaptation, and peace and security

Initiatives

- Protection of biodiversity and natural ecosystems
- Reversal of trends and mitigation of impacts especially concerning poorer communities

Figure 5. UN SDGs 12-15.

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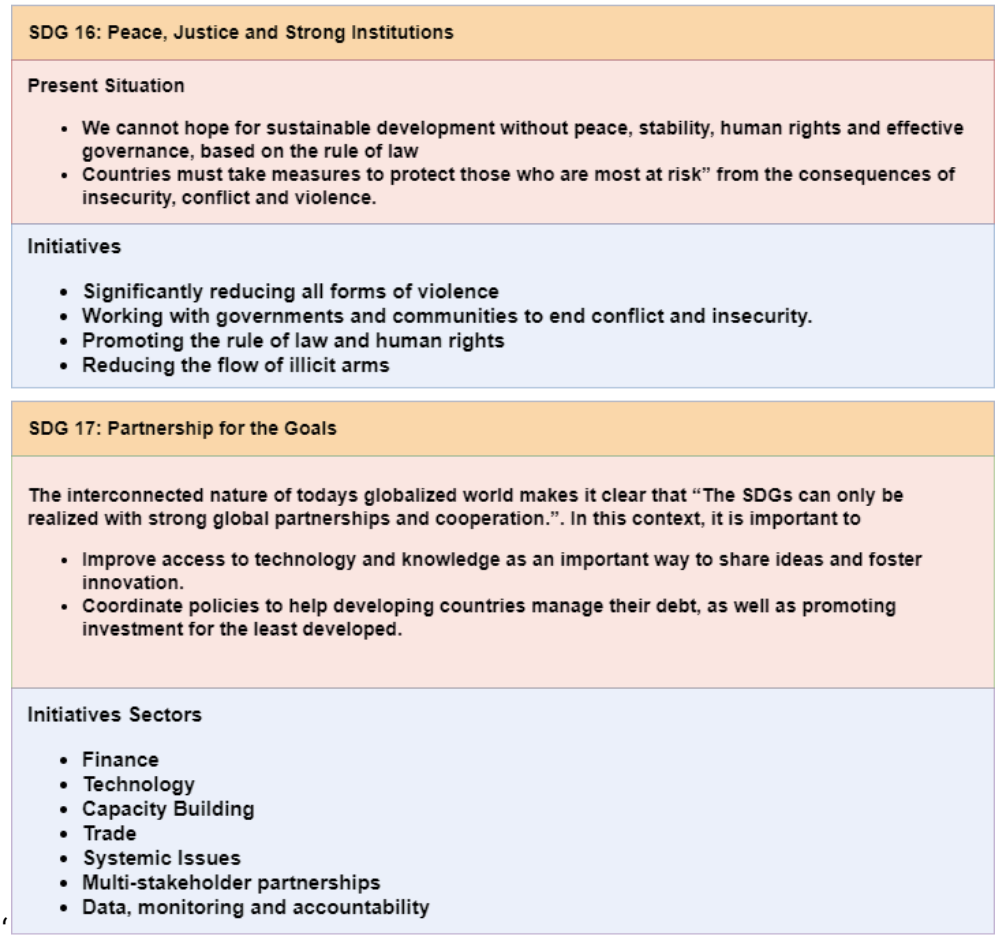

Figure 6. UN SDGs 16-17.

1.3 European Green Deal

1.3.1 Overview

The European Green Deal (EGD) is a set of proposals adopted by the European Commission in response to the ongoing climate crisis. The EGD aims to "transform the EU into a modern, resource-efficient and competitive economy" by ensuring:

- No net emissions of greenhouse gases by 2050.
- Economic growth decoupled from resource use.
- No person and no place left behind.

The main goal is to "make the EU's climate, energy, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels". Furthermore, the EGD aims to "improve the well-being and health of citizens and future generations" as collected and represented in Figure 7.

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Figure 7. EGD Key Concepts.

The EGD initiatives are categorized in 9 fields of action that are elaborated in the following subsections.

1.3.2 EGD Field 01: Climate

Becoming the first climate neutral continent by 2050.

The European Green Deal aims to make Europe climate neutral by 2050 (European Climate Law), setting a net greenhouse gas emissions reduction target of at least -55% by 2030, compared to 1990 levels. Main points mentioned in the context of this field of action include:

- The need to reduce emissions across sectors (industry, energy, transport, farming etc) in order to meet decarbonization objectives.
- The EU actively engages and supports its international partners on climate action (UN Framework Convention of Climate Change (UNFCCC) and its Paris Agreement).
- In parallel to mitigation actions, the EU is taking action on climate adaptation, to face the unavoidable impacts of climate change.
- The Commission itself joined the European Climate Pact and pledged to make its operations climate neutral by 2030.

1.3.3 EGD Field 02: Energy

A clean and efficient energy transition

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Decarbonising the EU's energy systems that accounts for more than 75% of the EU's greenhouse gas emissions is critical to reach our 2030 climate objectives and the EU's long-term strategy of achieving carbon neutrality by 2050.

3 key principles for the clean energy transition, which will help reduce greenhouse gas emissions and enhance the quality of life of our citizens:

- Ensuring a secure and affordable EU energy supply.
- Developing a fully integrated, interconnected and digitalised EU energy marke.t
- Prioritising energy efficiency, improving the energy performance of our buildings and developing a power sector based largely on renewable sources.

The Commission's main objectives to achieve this are:

- Build interconnected energy systems and better integrated grids to support renewable energy sources.
- Promote innovative technologies and modern infrastructure.
- Boost energy efficiency and eco-design of products.
- Decarbonise the gas sector and promote smart integration across sectors.
- Empower consumers and help EU countries to tackle energy poverty.
- Promote EU energy standards and technologies at global level.
- Develop the full potential of Europe's offshore wind energy.

1.3.4 EGD Field 03: Environment and oceans

Protecting our biodiversity and ecosystems.

Europe's seas, oceans, and environment are a source of natural and economic wealth for Europe that requires preservation and protection. Priorities to ensure the sustainability of the blue economy and fisheries sectors include:

- Protecting our biodiversity and ecosystems.
- Reducing air, water and soil pollution.
- Moving towards a circular economy.
- Improving waste management.

1.3.5 EGD Field 04: Agriculture

A healthy food system for people and the planet

The link between healthy people, healthy societies and a healthy planet puts sustainable food systems at the heart of the EGD. A shift to a sustainable food system can bring environmental, health and social benefits, as well as offer fairer economic gains. The EU's goals are:

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- Ensure food security in the face of climate change and biodiversity loss.
- Reduce the environmental and climate footprint of the EU food system.
- Strengthen the EU food system's resilience.
- Lead a global transition towards competitive sustainability from farm to fork.

1.3.6 EGD Field 05: Transport

Providing efficient, safe and environmentally friendly transport.

On one hand, the transport system is critical to European businesses and global supply chains and contributes 5% to EU GDP as well employing more than 10 million people in Europe. On the other hand, transport emissions represent 25% of EU's total greenhouse gas emissions and have increased over the recent years. This calls for:

- A clear path is needed to achieve a 90% reduction in transport-related greenhouse gas emissions by 2050.

1.3.7 EGD Field 06: Industry

An industrial strategy for a competitive, green and digital Europe

The EGD aims to transform the EU into a fairer and more prosperous society, with a modern, resource-efficient and competitive economy, with no net emissions of greenhouse gases by mid-century. In this context it is important to note that:

- The main goal is to harness the significant potential in global markets for low-emission technologies, sustainable products and services to achieve climate neutrality by 2050.
- Achieving a climate neutral and circular economy requires the full mobilisation of industry across all sectors.
- By providing affordable, clean technology solutions and by developing new business models, industries will be assisted in reducing their carbon footprint.
- EU aims to ensure that European industry can lead the accelerated green and digital transitions.

1.3.8 EGD Field 07: Research and innovation

Driving transformative change.

Becoming the world's first climate-neutral continent by 2050 is a once in a lifetime opportunity to modernise the EU's economy and society and re-orient them towards a just and sustainable future. Research and innovation will play a central role in

- Accelerating and navigating the necessary transitions
- Deploying, demonstrating and de-risking solutions
- Engaging citizens in social innovation

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Funding and support initiatives include a spectrum of tools such as

- Horizon Europe Program
- Green partnerships
- Green missions
- Green research and innovation rules

1.3.9 EGD Field 08: Finance and regional development

Sustainable investments to deliver the European Green Deal

To achieve the goals set by the European Green Deal, the Commission has pledged to mobilise at least €1 trillion in sustainable investments over the next decade. This goal will be pursued through multiple avenues such as:

- Investing in a green future
- EU Cohesion policy
- Mobilising public and private investments

1.3.10 EGD Field 09: New European Bauhaus

A creative and interdisciplinary initiative that connects the European Green Deal to our living spaces and experiences.

The New European Bauhaus is a creative and interdisciplinary initiative that connects the EGD to our living spaces and experiences. It calls on all of us to imagine and build together a sustainable and inclusive future that is beautiful for our eyes, minds, and souls. Beautiful are the places, practices, and experiences that are:

- Enriching, inspired by art and culture, responding to needs beyond functionality.
- Sustainable, in harmony with nature, the environment, and our planet.
- Inclusive, encouraging a dialogue across cultures, disciplines, genders and ages.

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1.3.11 Collected Data

EGD Fields of Action

EGD Field 01: Climate

Becoming the first climate neutral continent by 2050.

- The need to reduce emissions across sectors
- The EU actively engages and supports its international partners on climate action
- EU is taking action on climate adaptation
- The Commission itself joined the European Climate Pact

EGD Field 02: Energy

A clean and efficient energy transition.

- Ensuring a secure and affordable EU energy supply.
- Developing a fully integrated, interconnected and digitalised EU energy market
- Prioritising energy efficiency, improving the energy performance of our buildings and developing a power sector based largely on renewable sources

EGD Field 03: Environment and oceans

Protecting our biodiversity and ecosystems.

- Protecting our biodiversity and ecosystems.
- Reducing air, water and soil pollution.
- Moving towards a circular economy
- mproving waste management.

EGD Field 04: Agriculture

A healthy food system for people and the planet.

- Ensure food security in the face of climate change and biodiversity loss.
- Reduce the environmental and climate footprint of the EU food system.
- Strengthen the EU food system's resilience.
- Lead a global transition towards competitive sustainability from farm to fork.

EGD Field 05: Transport

Providing efficient, safe and environmentally friendly transport.

- **A clear path to achieve a 90% reduction in transport-related greenhouse gas emissions by 2050**

Figure 8. EGD Fields of Action 01-05.

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EGD Field 06: Industry

An industrial strategy for a competitive, green and digital Europe

- Harness the potential in global markets for low-emission technologies, sustainable products and services
- Full mobilisation of industry across all sectors.
- Through affordable, clean technology solutions and new business models to industries will be assisted in reducing their carbon footprint.
- EU aims to ensure that European industry can lead the accelerated green and digital transitions.

EGD Field 07: Research and innovation

Driving transformative change.

- Accelerating and navigating the necessary transitions
- Deploying, demonstrating and de-risking solutions
- Engaging citizens in social innovation

EGD Field 08: Finance and regional development

Sustainable investments to deliver the European Green Deal.

- Investing in a green future
- EU Cohesion policy
- Mobilising public and private investments

EGD Field 09: New European Bauhaus

A creative and interdisciplinary initiative that connects the European Green Deal to our living spaces and experiences.

- Enriching, inspired by art and culture, responding to needs beyond functionality.
- Sustainable, in harmony with nature, the environment, and our planet.
- Inclusive, encouraging a dialogue across cultures, disciplines, genders and ages

Figure 9. EGD Fields of Action 06 – 09.

1.4 New European Bauhaus

1.4.1 Overview

The New European Bauhaus initiative aims to connect the EGD with citizens daily lives and living spaces. It includes creative, ecological, economic and interdisciplinary actions aiming to mobilize communities to “imagine and build together a sustainable and inclusive future that is beautiful for our eyes, minds, and souls.”. The NEB initiative will support the EGD implementation by providing “tangible experiences in terms of products and the built environment, linking sustainable lifestyles with style”.

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Concept and Characteristics

Its main characteristics include:

- It is a bridge between the world of science and technology, art and culture.
- It is about leveraging our green and digital challenges to transform our lives for the better.
- It is an invitation to address complex societal problems together through co-creation.

The initiative's main concept is based on the idea that "a sustainable society is also a cultural shift based on empathy, compassion, creativity and shifting paradigms". The role of art and culture is crucial in achieving this paradigm shift. (Von der Leyen, 2022). Through an inclusive, multidisciplinary and participatory approach, NEB activities aim to "steer the transformation of our societies along three inseparable values":

- Sustainability, from climate goals to circularity, zero pollution, and biodiversity.
- Aesthetics, quality of experience and style beyond functionality.
- Inclusion, from valuing diversity to securing accessibility and affordability.

The NEB ultimately aspires to bring "citizens, experts, businesses, and institutions together to reimagine sustainable living in Europe and beyond". The delivery of the NEB is outlined in a series of frameworks, core principles and key actions adopted by the European Commission.

The initiative's approach is multi-level from global to local, participatory and transdisciplinary. Several areas of action are presented in the NEB portal.

From co-design to the delivery of transformation

Four thematic axes will guide the initiative's implementation:

- Reconnecting with nature.
- Regaining a sense of belonging.
- Prioritising the places and people that need it most.
- Fostering long term, life cycle and integrated thinking in the industrial ecosystem

These key themes take inspiration from the views and experiences of thousands of citizens, professionals and organisations across the EU who joined the co-design of the initiative and the open conversation about rethinking the way we live together. Moving forward, the New European Bauhaus movement will focus on three key interconnected transformations:

- Of places on the ground.
- Of the environment that enables innovation.
- Of our perspectives and way of thinking.

Support framework and calls for proposals.

Inspired by the co-design phase, which allowed to further define the concept and priorities for the New European Bauhaus actions, the delivery presents the first elements of a support framework at EU level. The combination of several EU financing instruments with complementary scopes reflects the transdisciplinarity of the initiative.

The Communication presents plans to build on and mobilise EU funds to support pilot projects, explore new avenues and turn the ideas of the New European Bauhaus movement into reality. Through the links below, you will find the different EU funding opportunities supporting the initiative. Several calls (fully dedicated or contributing to the New European Bauhaus) are presented according to the three main types of impact they seek.

- Places on the ground - Supporting the concrete transformation of the built environment and associated lifestyles at local level.
- Enabling environment for innovation - Supporting innovation aimed at integrating sustainability, inclusion, and aesthetics in new solutions and products.
- Diffusion of new meanings - Questioning our perspectives and mind-set around the core values of aesthetics, sustainability and inclusion.

The Commission will also invite EU Member States to mainstream the New European Bauhaus core values in their strategies for territorial and socio-economic development and mobilise the relevant parts of their recovery and resilience plans, as well as the programmes under cohesion policy to build a better future for everyone.

Working with the New European Bauhaus Community

The Commission will establish a New European Bauhaus Lab to work with its growing community to co-create, prototype and test the tools, solutions and policy actions that will facilitate the transformation on the ground.

To allow visibility for the change makers, to encourage them to share progress and results, and to foster the engagement of citizens, we will convene a New European Bauhaus Festival for the first time in spring 2022. The first edition of the festival will take place in Brussels and will be organised and financed by the European Commission. Based on this experience, the Commission will draw up a concept for a

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yearly event that will, ideally, include places in and outside the EU from 2023 onwards.

Next steps

- Calling on all EU Institutions to promote the debate further across Europe and beyond.
- Inviting EU Member States to appoint a NEB contact to coordinate local efforts and participate in an EU wide informal network to exchange information and experience.
- Publishing a report on progress in 2022.

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New European Bauhaus (NEB)

Main characteristics

- It is a bridge between the world of science and technology, art and culture.
- It is about leveraging our green and digital challenges to transform our lives for the better.
- It is an invitation to address complex societal problems together through co-creation.

Three inseparable values:

- **Sustainability, f**rom climate goals to circularity, zero pollution, and biodiversity.
- **Aesthetics,** quality of experience and style beyond functionality.
- **Inclusion,** from valuing diversity to securing accessibility and affordability.

From co-design to the delivery of transformation

Four thematic axes will guide the initiative's implementation:

- Reconnecting with nature.
- Regaining a sense of belonging.
- Prioritising the places and people that need it most.
- Fostering long term, life cycle and integrated thinking in the industrial ecosystem

The New European Bauhaus movement will focus on t**hree key interconnected transformations**:

- Of places on the ground.
- Of the environment that enables innovation.
- Of our perspectives and way of thinking.

Three main types of impact

- **Places on the ground -** Supporting the concrete transformation of the built environment and associated lifestyles at local level.
- **Enabling environment for innovation -** Supporting innovation aimed at integrating sustainability, inclusion, and aesthetics in new solutions and products.
- **Diffusion of new meanings -** Questioning our perspectives and mind-set around the core values of aesthetics, sustainability and inclusion.

Working with the New European Bauhaus Community

Work with its growing community to co-create, prototype and test the tools, solutions and policy actions that will facilitate the transformation on the ground.

Next steps

- Calling on all EU Institutions to promote the debate further across Europe and beyond.
- Inviting EU Member States to appoint a New European Bauhaus contact to coordinate local efforts and participate in an EU wide informal network to exchange information and experience.
- Publishing a report on progress in 2022.

Figure 10. NEB Basic Concepts.

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1.4.2 NEB Values, Ambitions and Working Principles

As presented in depth in the context of Deliverable 2.2 of the HeritACT Project, the "New European Bauhaus Compass is described as a 'guiding framework' applying the NEB principles and criteria.". It lays out the Values and Ambitions of the NEB Initiative as well as the working principles involved in its implementation.

Values and Ambitions

- Beautiful
  - AMBITION I: to activate.
  - AMBITION II: to connect.
  - AMBITION III: to integrate.
- Together
  - AMBITION I: to include.
  - AMBITION II: to consolidate.
  - AMBITION III: to transform.
- Sustainable
  - AMBITION I: to repurpose.
  - AMBITION II: to close the loop.
  - AMBITION III: to regenerate.

Working Principles

- Participatory Process
  - AMBITION I: to consult.
  - AMBITION II: to co-develop.
  - AMBITION III: to self-govern Partnership.
- Multi-Level Engagement
  - AMBITION I: to work locally.
  - AMBITION II: to work across levels.
  - AMBITION III: to work across levels to work globally.
- Transdisciplinary Approach
  - AMBITION I: to be multidisciplinary.
  - AMBITION II: to be interdisciplinary.
  - AMBITION III: to be beyond disciplinary.

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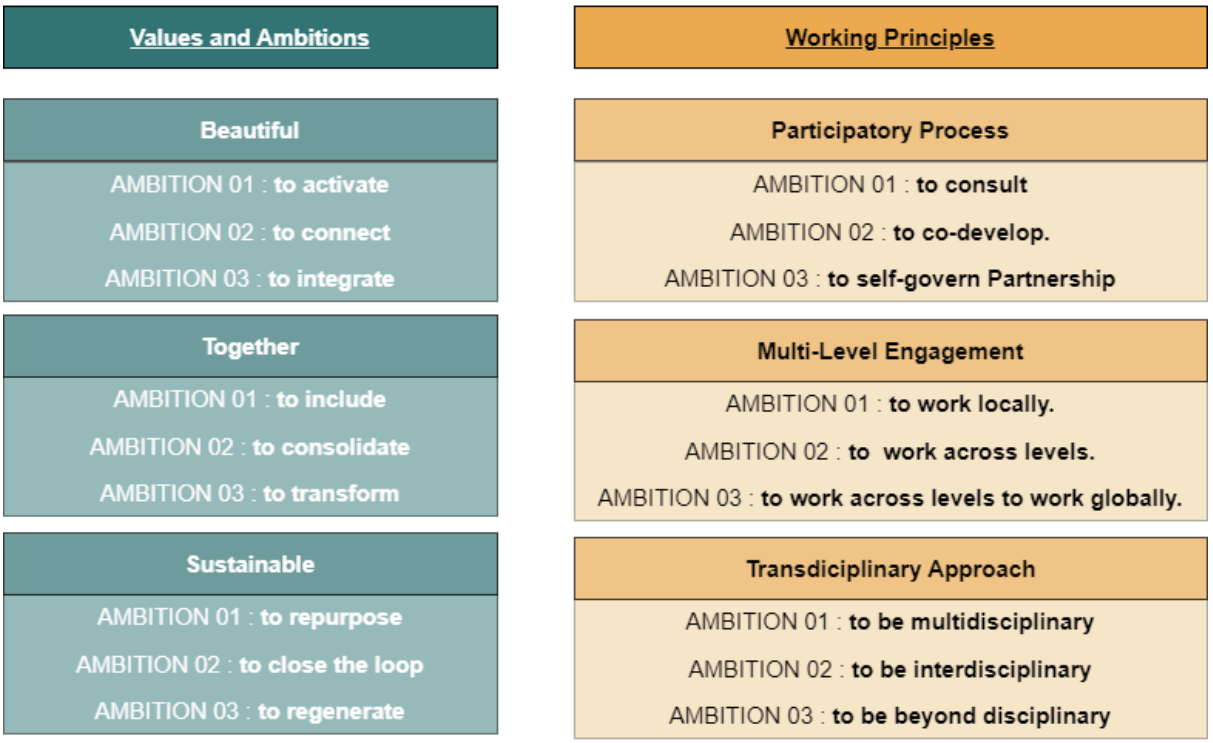

Figure 11. NEB Values, Ambitions and Working Principles.

1.5 Discussion and Collected Data

The present chapter commenced by reiterating the objectives of the HeritACT project and the proposed KPIs as laid out in the Grant Agreement. These provide the basis for structuring the Impact Assessment Framework since they collect the main areas in which the results will be mapped. The following sections collated the descriptions, principles and goals of three separate international initiatives, the UN Sustainable Development Goals (SDGs), the European Green Deal (EGD) and the New European Bauhaus (NEB). The collected data is available online as represented in Figure 12.

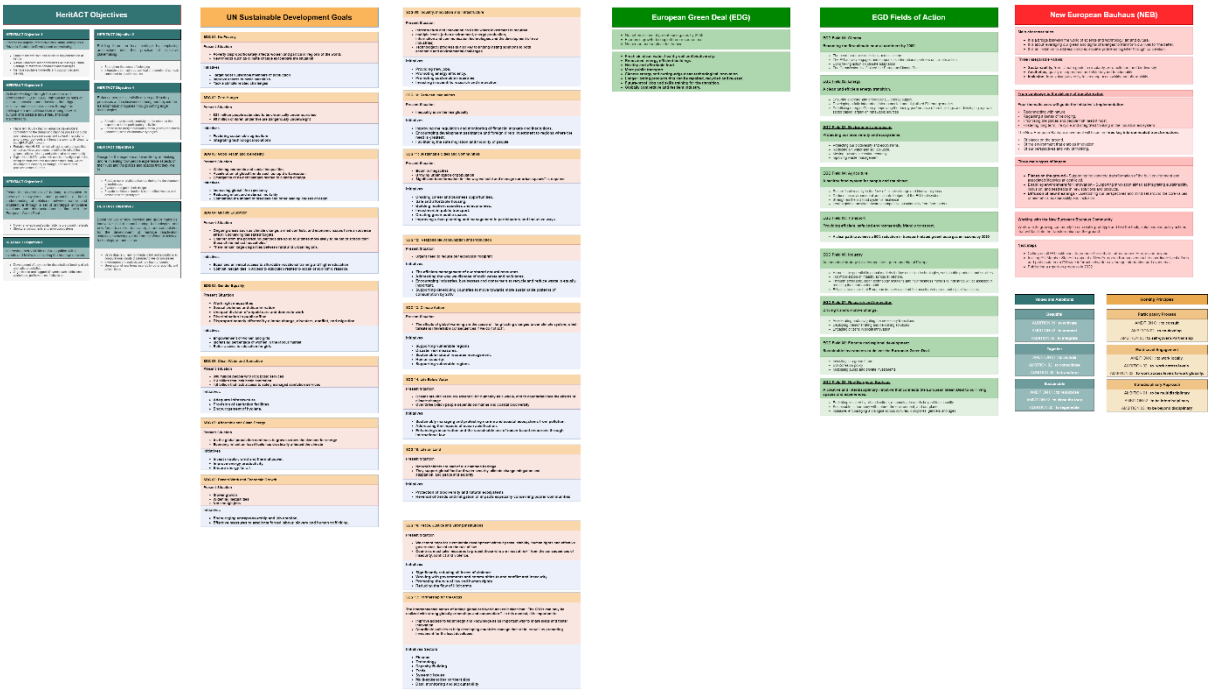

Figure 12. Collected Context.

This material provides the basis for the first level of assessment analysis, be vis a vis.

- The SDG objectives.
- The EGD concepts and action sectors.
- The NEB methodology, values, ambitions and working principles.
- The HeritACT broad objectives.

Considering the mapping of the various project actions which will be assessed to these frameworks, it is apparent that the interconnections and interdependencies cannot be represented in a serial and singular manner, since a single objective or specific project KPI can map to multiple SDGs objectives. EGD fields of action and NEB values. Conversely, tracking SDGs, EGD and NEB concepts in specific HeritACT activities must take into account the overlapping and broad nature of these concepts as well as the fact that the project activities are currently being developed. Therefore, the Impact Assessment Framework will need multiple “resolutions” from tracking specific KPIs linked to Tools, Solutions and Activities to linking the results with broader Goals and Objectives.

With these observations in mind, the present section does not aim to provide a Specific Assessment Table or Checklist, rather provide the outline of an assessment model in which HeritACT activities can be mapped and assessed in relation to multiple frameworks. The collation of data as presented previously represents the

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first tool of this model, concentrating and codifying basic concepts related to the broader frameworks in which the project is situated.

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2/ Impact Assessment Methodology

This chapter outlines the Impact Assessment Methodology of HeritACT project and it includes 3 section. Firstly, the definition of the impact assessment and the types of impact asssesment: i) Environmental and Social Impact Assessment (ESIA) / Heritage Impact Assessment (HIA), if it focuses on heritage, and ii) Strategic Environmental Assessment. Then, the role of the Environmental and Heritage Impact Assessment in sustainable development is thoroughly explained. The third section presents the HeritACT Impact Assessment Methodology analysing its phases and the steps each phase includes.

2.1 Introduction to Impact Assessment

2.1.1 Impact Assessment Definition

Impact assessment is defined as the "process of identifying the future consequences of a current or proposed action" [1]. Impact assessment has been described as 'thinking before acting' [2] and it informs decision-making by investigating the environmental effects of the planned actions. It should be performed prior to making any final decisions or actions, so that any findings can genuinely affect a final decision.

2.1.2 Types of Impact Assessment

There are two basic types of impact assessment that can be performed at various scales depending on the nature of the planned action and can focus on particular issues related to heritage:

i. Environmental and Social Impact Assessment (ESIA); if the assessment focuses on heritage, it may be called a Heritage Impact Assessment (HIA).
ii. Strategic Environmental Assessment (SEA).

Environmental and Social Impact Assessment (ESIA), also known as an Environmental Impact Assessment (EIA), is a project-level assessment of the impacts of a particular proposed activity. The assessment is typically performed on larger projects with major potential environmental implications, but it can also encompass

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small-scale projects in sensitive cases. ESIAs frequently incorporate a heritage impact assessment, as well as other environmental and social factors.

Heritage Impact Assessment (HIA) is project-specific assessment that focuses on the potential impact on the values[1] of heritage property. The ICOMOS Heritage Impact Assessment guidance was developed to evaluate the impact of large-scale development projects or proposals, specifically on four World Heritage asset categories: "Archaeological attributes, Built heritage or Historic Urban Landscape attributes, Historic landscape attributes, and Intangible Cultural Heritage attributes or Associations" [4].

In addition to an ESIA, a rising number of countries require a Strategic Environmental Assessment (SEA) of the previous policies, plans, and/or programs that provide a framework for specific projects. By properly considering historic issues early in the planning phase, SEA can support project decision-making. SEA is also more appropriate than ESIA to evaluate the accumulated impacts of several projects at a regional scale (even those that do not require ESIA), as well as to establish strategic and generic mitigation actions that may be applied similarly to all projects.

Figure 13 depicts the definition of the impact assessment and their types.

[1] The term 'heritage values' refers to the meanings and values that individuals or groups of people bestow on heritage (including collections, buildings, archaeological sites, landscapes and intangible expressions of culture, such as traditions). These values have been a key factor in the legitimation of heritage protection and management. There are many classifications of values, including historical, aesthetic, economic, social, scientific etc [3].

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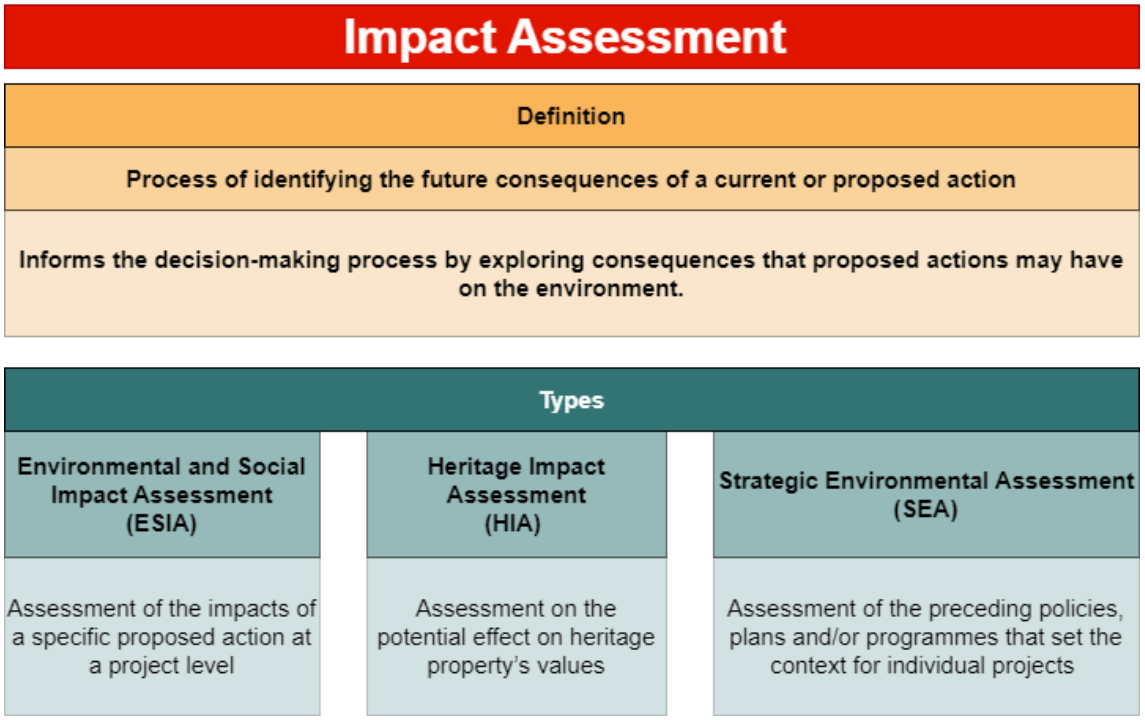

Figure 13. Impact Assessment Definition and Types.

Table 1 summarizes the main differences between ESIA and SEA.

Table 1. The difference between SEA and ESIA [CSIR, 1996; World Heritage Leadership].

	Strategic Environmental Assessment (SEA)	**Environmental and Social Impact Assessment (ESIA)/ Heritage Impact Assessment (HIA)**
Applies to	Policies, plans and/or programmes ('strategic actions')	Projects with significant environmental impacts
Carried out by	Usually a planning authority (public), usually via a consultant Project proponent (public or private), usually via a consultant	Project proponent (public or private), usually via a consultant

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Links to decision-making	Informs decisions on policy/ plan/ programme development	Informs decisions on project permitting/licensing
Scope of applicability	More limited requirements worldwide: e.g. required for plans and programmes but not policies in European Union countries	Required in most jurisdictions; also by most multilateral financial institutions (ESIA only)
General approach	More strategic, proactive, political, broad-brush	More reactive, technical, specific, detailed
Alternatives	Considers potentially greater number of strategic alternatives: why, how, where	Considers limited number of specific alternatives: where, how
Impact identification	Identifies more general environmental/sustainability implications of the proposed policy/plan/programme	Identifies specific impacts of the proposed project
Cumulative impacts	Focuses on whether thresholds/standards are exceeded	Assesses impacts of other projects jointly with project impacts
Mitigation	Aims to set generic mitigation measures applicable to all projects arising from the policy/ plan/ programme, with a focus on achieving sustainability objectives	Aims to avoid/minimize impacts of the project

As shown in Table 1, SEA can serve as a framework for evaluating specific projects and associated ESIAs. When suitable, SEA and ESIA are complimentary methodologies that can be utilized at the same heritage property. SEA has the benefit of being more proactive and strategic, as well as the ability to address concerns on a broader landscape scale, potentially facilitating decision-making before any specific actions are presented. ESIA may then assist in thoroughly understanding a specific proposed intervention and ensuring that there are no potential negative repercussions on the heritage site.

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2.2 Role of Environmental Impact Assessment and Heritage Impact Assessment in the Sustainable Development

The term 'environment' in impact assessment encompasses physical, biological, resource usage, social, cultural, health, and economic components, therefore it can be used to both natural and cultural assets. The environment has been identified as one of the three primary elements of sustainable development (i.e., "economic development, social development, and environmental protection" [5]. It is regarded as the primary concern of sustainable development (Rio 92 Conference or the Earth Summit Agenda 21, Principle 4 and 17, in sustainable development [6], the United Nations Conference on Sustainable Development in 2012, Rio+20 [7]). According to the International Association for Impact Assessment, one of the key goals of EIAs is to "promote sustainable development that optimizes resource use and management opportunities" [8]. The primary focus of the IA is "to ensure more sustainable and lower environmental and social risk solutions." Overall, the EIA has been seen as a proactive evaluation tool that assists sustainable and balanced decisions in spatial development and design.

Figure 14 depicts the definition of the 'environment' term as well as the objectives of ESIA.

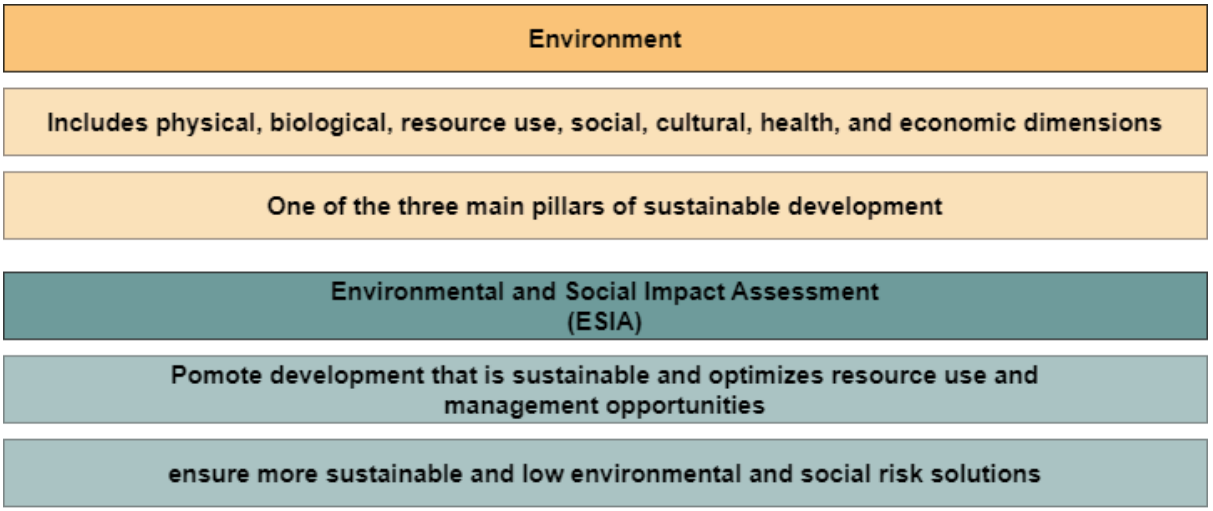

Figure 14. Environment and ESIA Objectives.

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According to the EIA context, HIA has been developed to recognize and evaluate major impacts on cultural properties, especially to promote cultural heritage protection within the context of sustainable development. Many documents acknowledge the role of cultural heritage and the importance of cultural heritage protection as part of sustainable development (e.g., Article 3 of the UNESCO Universal Declaration on Cultural Diversity [9], Articles 1, 5, and 10 of the Council of Europe Framework Convention on the Value of Cultural Heritage for Society [10], Paragraph 119 of the UNESCO Operational Guidelines for the Implementation of the World Heritage Convention [11], Paris Declaration).

2012 World Bank research defined "heritage as cultural capital," emphasizing that heritage investment has an economic basis with positive returns [13]. The Hangzhou Declaration: Placing Culture at the Heart of Sustainable Development Policies, issued in 2013, emphasized the importance of preserving historic urban and rural regions to foster sustainable ways of production and consumption, as well as sustainable urban and architectural design solutions [14]. Similarly, the European project 'Cultural Heritage Counts for Europe (CHCFE)' indicated that cultural heritage projects might have a beneficial impact on Europe's economy, culture, society, and environment, which are the four elements of sustainable development [15].

Finally, under target 11.4 of the UN 2030 Agenda for Sustainable Development, the necessity of enhancing efforts to safeguard the world's cultural and natural heritage was highlighted [16]. According to the document, the heritage conservation project focuses on the local area's historical and cultural heritage assets to increase pride and meet the social and economic difficulties and opportunities of urban development [17]. As a result, using HIA is highlighted as a policy statement of Goal 11 [18]. Cultural heritage protection is critical to long-term growth. In this case, HIA, as a decision-making support tool, can assist in mitigating the adverse impacts on heritage properties, which is a necessary condition for their protection and management.

Figure 15 depicts the basic points of cultural heritage and HIA.

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Figure 15. Cultural Heritage and HIA.

2.3 HeritACT Impact Assessement Methodology

As depicted in Figure 16, HeritACT Impact Assessment Methodology includes four phases:

1. Determination of the impact assessment's importance and Identification of potential impacts, needs, existing gaps and examination of alternative stages.
2. Assessment methodology and Development of mitigation and enhancement strategies (KPIs).
3. Report documentation and review.
4. Decision-making and implementation.

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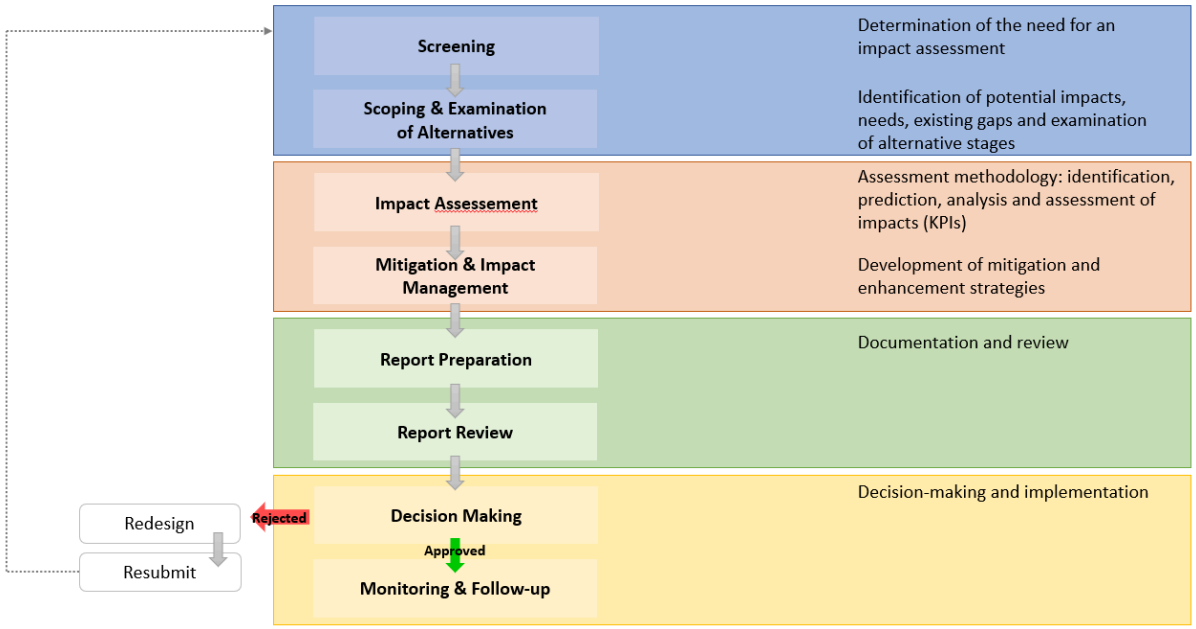

Figure 16. HeritACT Impact Assessment Methodology.

Each phase consists of specific steps which are described in sections 2.3.1-2.3.4.

2.3.1 Phase 1: Determination of the impact assessment's importance / Identification of potential impacts, needs, existing gaps / Examination of alternative stages

Phase 1 includes two steps: i) Screening and ii) Scoping and examination of alternatives, which are described below.

Screening

Screening is the initial step in determining whether an assessment is required. When the screening process shows that the project may have a negative impact on heritage/conservation values, an impact assessment needs to be performed and the proponent should be encouraged to examine and modigy the proposed action, if necessary, to prevent or mitigate those consequences. The nature, scale, and features of the planned activity; the sensitivity of the receiving environment; and the sorts of anticipated repercussions are all factors to examine during the screening process.

Scoping and examination of alternatives

The purpose of the assessment report is defined by scoping. If the scoping process is done correctly, it may serve as a strong basis for the subsequent impact assessment process, saving time and resources while ensuring that the impact assessment emphasizes to the project objectives. The scoping document can be

utilized for assessing the quality of the impact assessment and final report at a later stage. The first identification of alternative solutions to the proposed action permits a study to determine if the project's environmental impacts can be significantly reduced.

The scoping stage should determine the type and quantity of data required for the **baseline assessment**. The baseline assessment should outline the current state of heritage property values and their characteristics. The baseline should also provide details on other heritage/conservation values of the property: relevant international, national, and local level designations in the context of the study area, why they were designated, their sensitivities, and so on. Possible baseline data sources include:

- engagement activities with local communities and other stakeholders,
- cultural mapping,
- ethnographic studies,
- site visits,
- urban heritage mapping,
- socio-economic studies,
- visitor surveys/studies,
- landscape characterization studies,
- geological surveys,
- ecological/biodiversity surveys, etc.

The second step of phase 1 also includes an early **examination of alternatives** to proposed actions, which means that a variety of options can be taken into consideration while it remains possible to affect decision-making and even avoid negative consequences entirely by not proceeding with a specific proposed action. Exploring alternatives may also result in the revision or abandonment of a proposed action.

Alternatives can be considered in three steps:

a) *Identify reasonable alternatives.* Alternatives of various types can be developed and examined, with those higher up the 'alternatives ladder' (Figure 17) frequently having the greatest potential to be really sustainable and decrease negative impacts. Typically, strategic options will emphasize 'why' (Why is the recommended action being proposed?), 'what' (What action is required?) and 'where' (Where should the action be carried out?). More extensive project-level alternatives will frequently concentrate on 'where' (specifically, where should the proposed action's elements be located?) and 'how' (project management and scheduling).

b) *Assess and compare alternatives.* The consequences of possible alternatives should be examined and compared using the same procedures and level of accuracy as the proposed action.
c) *Explain the choice of preferred alternative.* A clear explanation for selecting the chosen alternative should be provided, including its environmental, social, and economic sustainability, and also its cost, technical feasibility, local acceptability, and so on.

Figure 17. The 'alternatives hierarchy'. The higher-level alternatives generally have more potential for reducing negative impacts and promoting sustainability.

2.3.2 Phase 2: Impact Assessment and Development of mitigation and enhancement strategies

Phase 2 includes two steps: i) Impact Assessment and ii) Development of mitigation and enhancement strategies, which are described below.

Impact Assessment

The impact assessment process detects, forecasts, analyzes, and assesses the positive and negative impacts of the project. Identifying and forecasting impacts is a technical phase at the heart of the impact assessment process that necessitates professional input from a wide range of relevant disciplines. It is suggested that the impact identification and evaluation results be confirmed, as well as mitigating solutions for any significant negative impacts be examined.

The interaction of a planned activity with a heritage property attribute, which might be negative or positive - biophysical, social, cultural, economic, health, visual, and so on - is referred to as an impact. All relevant impacts need to be investigated, including those affecting intangible features reflected in the physical aspects of the property.

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The impact assessment process includes impacts identification, impacts prediction and impacts evaluation stages.

Impacts identification

The proposed action can have a direct impact on the heritage site's values. It can also have indirect impacts, where a direct impact has follow-on impacts. These also need to be formally identified and assessed. The impacts of a proposed action may also combine with those of other past, existing or future actions and other factors (such as climate change) that may affect a heritage property and have a cumulative impact. The suggested actions may set a precedent with following cumulative impacts. Therefore, it is critical to be aware of previous actions in the past, present, and future, rather than considering a particular action in isolation. When cumulative impacts are substantial, a separate section in the final impact assessment report is required to address them clearly. Impacts can occur at any point of a proposed action's life cycle; hence the full life cycle must be evaluated.

Impacts prediction

Once possible impacts have been identified, an informed forecast regarding the extent and character of those impacts can be developed. The impact forecasting should compare the heritage property's baseline conditions to the situation with the proposed action; this should be done for each possible alternative as well as the proposed action. This is a technical stage, and the results should be explained.

Potential impact predictions can incorporate a variety of characteristics (Table 2). In certain circumstances, it may be able to quantify the impact, while in others, a narrative description may be the only alternative. In every case, the impact should be described as precisely as possible.

Table 2. Characteristics of potential impacts and prompt questions as part of an impact assessment.

Impact characteristic	Prompt question	Examples
Magnitude	What change will occur?	A measurable estimate, e.g., number of buildings demolished, concentration of a pollutant
Type	Is the impact positive or negative?	Positive, negative, neutral

Extent	Over what area will the impact take place?	A measurable estimate, e.g., hectares of habitat cleared
Duration	How long will the impact last?	Short-term (days/weeks), long-term (years/ decades), permanent
Frequency	How often will this impact occur?	Once, intermittent infrequent, intermittent frequent, continuous
Reversibility	Can this impact be reversed? Is it easy to reverse?	Naturally reversible, reversible through human intervention, easy or difficult to reverse, irreversible
Likelihood	How likely is it that this impact will occur?	Categories can be defined, such as 'possible', 'probable', 'definite'

While recognizing that some degree of uncertainty is inevitable the prediction should give as solid and transparent a foundation for decision-making as possible. Among the impact prediction techniques are:

- *Quantitative analysis*: impacts are calculated using baseline data and an understanding of the proposed activity. Models can be used to examine more complex circumstances, such as indirect and cumulative impacts.
- *Professional judgement*: based on similar initiatives in cultural sites in the same area, qualified experts can provide a more qualitative estimate.
- *Case studies*: studying other similar projects or research that has occurred in a comparable environment, especially if monitoring data is available.

Quantifying impacts allows for clear comparisons of what is expected in the future with and without the proposed action, as well as the impacts of the proposed action and any alternatives. Where this is difficult, impacts can be evaluated using categories such as "high," "medium," and "low." If there is a large degree of uncertainty, providing best- and worst-case scenarios may be valuable. Such methods, including any category definitions used, should be fully documented in the final report (Phase 3).

Impacts evaluation

The characteristics of the expected impacts are used to determine whether the predicted impacts of the proposed action are considerable or not. Because this

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process immediately leads to the recommendations that will comprise the final impact assessment report, it is critical that it be transparent and accurate. Impact assessment entails measuring certain Key Performance Indicators (KPIs) related to HeritACT objectives (as analysed in Chapter 1).

Negative impacts mitigation and positive impacts enhancement

If the impacts are minor, there may be no need for mitigation. In all other circumstances, mitigation should be examined in order to prevent or reduce any negative consequences, and the updated proposed action, along with any mitigation measures, should be re-evaluated. As a result, impact assessment becomes an iterative process, with final projections including the intended mitigating actions.

The optimal outcome would be to totally avoid any negative impacts, which could include rejecting the proposed activity or relocating it away from the heritage property. However, it might require creative problem-solving to **rethink** and potentially **redesign** the proposed activity or search for mitigation measures. In some circumstances, it may not be possible to completely eliminate all negative effects, but they should be reduced to acceptable levels. Once mitigating measures have been identified, they must be incorporated into the revised proposed action, which must then be re-evaluated. Additional mitigation measures may be required. If considerable remaining negative impacts cannot be prevented, the impact assessment report should advise against proceeding with the proposed action.

On the other side, the incorporation of a sustainable development point of view into the assessment processes implies that impact assessment provides a chance to enhance or produce new positive impacts for the good of both heritage and society.

2.3.3 Phase 3: Report documentation and review

Phase 3 includes two steps: i) Report documentation and ii) Report review, which are described below.

Report documentation

The first step of Phase 3 is the final impact assessment report documentation is produced to describe and summarize the methodology and prior phases' conclusions. The report should be made accessible to a variety of interested groups, both expert and non-expert, for discussion. The findings should be presented properly so that anyone reading it can follow the study and comprehend why certain suggestions have been offered. It is critical to reflect on the contents of the report during the impact evaluation procedure in order to better guide future decision-making. The amount of detail required, as well as the extent of the report, will be determined by the complexity of the planned activity and the property. The assessment report is

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then evaluated again to ensure that the information presented meets the criteria for decision-making.

To regulate and verify the implementation of mitigation methods and actions, the approved proposal should be reviewed. However, the rejected application might be revised in order to be resubmitted for the new evaluation procedure. Table 3 is an example of the contents of an impact assessment report.

Table 3. Indicative contents of an impact assessment report.

Content	Description
Non-technical summary	• A clearly written summary of the report and its key findings and recommendations.
Contractual information and acknowledgements	• Information on funding of the report,role of the involved parties. • Who carried out the impact assessment work, including key authors or other contributing specialists. • A statement by the authors declaring no conflict of interest. • Any independent expert review.
Methodology	• A summary of the methodology used for the impact assessment. • Dates when various stages of the proposed action planning and impact assessment were carried out. • Stakelolders involvement. • Any knowledge gaps or uncertainties relating to the baseline data and/or the impact identification and prediction.
Baseline	• Analysis of the current state. • Summary of other heritage properties in or near the property which may also be impacted by the proposed actions.

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	• Relevant legal, regulatory and policy frameworks.
The proposed action and alternatives	• The need for the proposed action and its objectives. • A description of all stages (construction, operation, decommissioning, recovery) of the proposed action, with sufficient detail for the report to be read as an independent document. Further detailed information may be included as an annex. • Maps, plans and illustrations of the project location. • Alternatives which were considered.
Identification and evaluation of impacts	• Identification of the potential positive and negative impacts of the proposed action. • Prediction of the characteristics of these potential impacts. • Evaluation of the significance of potential impacts.
Mitigation measures	• Necessary mitigation measures. • Description of any residual impacts after mitigation.
Recommendations	• Recommendation for proceeding with the proposed action, a preferred alternative, or not proceeding in the light of impacts.
Follow-up	• Description of monitoring needed should the proposed action take place, including monitoring of the baseline and the implementation of mitigation measures.
Annexes	• Any detailed information gathered to describe the baseline. • Supporting technical information with regard to the prediction of impacts.

Review

The objective of the review is to examine whether the assessment methodology and conclusions are sufficient, particularly in terms of analyzing the impact on heritage property values, and whether they are suitable in terms of transparency and usability. A proper review procedure leads to trust in the impact assessment's conclusions.

A review of an impact assessment report can take various forms:

- The report should be distributed to all relevant stakeholders so that they can provide meaningful feedback. Many national frameworks allow for public review, and it is recommended to do so even if it is not legally accepted.
- An independent review of an impact assessment can be hired through competent and authorized independent experts; this can be especially useful in sensitive circumstances where the quality and transparency of the effect assessment are critical.

2.3.5 Phase 4: Decision-making and implementation

Phase 4 includes two steps: i) Decision-making and ii) Follow-up, which are described below.

Decisison-making

Throughout the impact assessment process, decisions about suggested actions are made. There are three options for making such a decision:

- *Approval is given*, with certain requirements (for example, mitigation measures). This should occur only if the proposed action, with conditions, will avoid any negative impacts on the values of heritage properties, or if any negative impacts are too slight for further examination.
- *Approval is deferred*, for example, because additional details are required or because the proposed action needs to be revised.
- *Approval is denied.*

Follow-up

If a proposed action is accepted, longer-term follow-up processes will be required to monitor and carry out the mitigation measures required to ensure that the value of heritage properties is protected and any sustainable development goals are met (Table 4). The impact assessment should identify the conditions - the required mitigation measures - for approval, which will serve as the foundation for a clear implementation strategy. The implementation plan will guide the development of the proposed action on the ground: it should clearly describe how the required mitigation measures outlined in the impact assessment will be applied and assessed.

When a big project is approved, it is recommended to develop an Environmental and Social Management Plan (ESMP), which details how the project will be implemented in accordance with applicable laws and agreed mitigation measures. The impact assessment approach can propose further domains that should be evaluated over time. This not only provides extra verification of the planned action's implementation but also ensures that more accurate and long-term data are accessible for the baseline study for any other future actions.

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Table 4. Follow-up activities after the proposed action has been approved.

Follow-up activity	Required actions
Implementation of required mitigation measures	Documentation of the impact assessment's recommendations for mitigation measures, and implementation of these as part of the development of the proposed action.
Baseline monitoring	Ongoing collection of information about the heritage property's attributes, which can be used to check against the baseline data collected during the impact assessment and the impact assessment predictions, to determine if the situation is proceeding as planned or if something needs doing.
Compliance monitoring and auditing	Ongoing collection of information and review against the conditions set as part of planning permission, to ensure that the conditions are being met.
Management	If monitoring indicates that issues have arisen that require action, then the management team in place can be used to respond promptly.
Communication	Informing stakeholders of the results of follow-up activities.
Enforcement	Where a heritage property's value is shown to be negatively affected by the project due to unforeseen circumstances, new situations or inadequate follow-up and implementation of the mitigation measures, the project should be immediately halted.

2.4 Discussion and Collected Data

The present section presented the context of the proposed Impact Assessment Model. An Analysis was undertaken on three interconnected levels.

- Impact Assessment Concepts
- Environment and Cultural Heritage Impact Assessment frameworks
- HeritACT Impact Assessment Methodology

The results from the analysis are the following:

- Identification of the salient concepts involved in Impact Assessment in relation to environment, heritage and broader contexts.
- The specification of Cultural Heritage Assessment methodologies
- Definition of steps and specification in the HeritACT IAVF

The collated codified form of this information is illustrated in Figure 18.

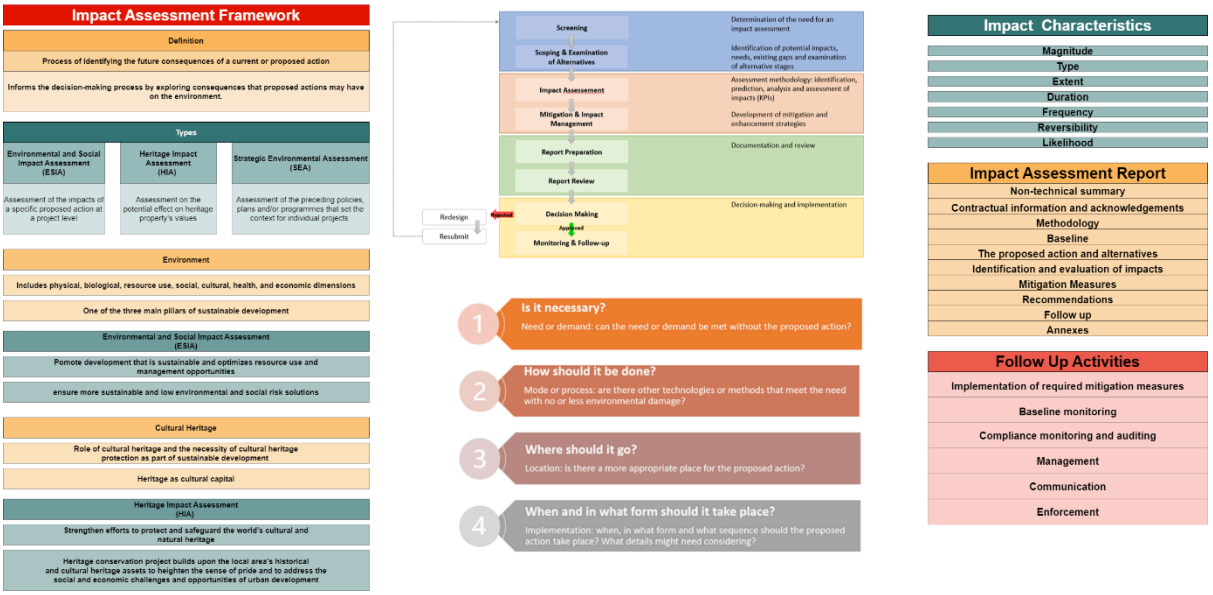

Figure 18. Impact Assessment Framework Datasheet.

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3/ HeritACT IAVF Outline

3.1 Overview

This section provides an outline of HeritACT Impact Assessment and Validation Framework (IAVF) that aims to *provide a list of representative indicators and processes* to monitor the project intervention success during the demonstration activities and impact" thereafter. The HeritACT IAVF builds on a results-based approach, including monitoring of the implementation based on the generation of outputs, validation of the resulting outputs, and assessment of broader social, economic and environmental outcomes and impacts. A set of representative indicators are delivered through selection and improvement of existing ones or development of additional indicators to monitor the project intervention success during the demonstration activities and impact thereafter.

The definition of appropriate benchmarks, thresholds or constraints for each of these indicators is considered and incorporated especially in cases where mandatory limits are set by the European or national legislations. This methodology will guide all activities of T6.2, T6.3 and T6.4 through the delivery of a handbook that will be used the relevant partners to carry out validation, evaluation and impact assessment activities.

Each stage of HeritACT IAVF is described in the following section.

3.2 Stages

The HeritACT IAVF adopted for developing impact indicators and calculating impacts consists of the following six stages.

- **Stage 1: Identification of the expected impacts**, through consultation with key stakeholders in each of the pilot sites and the development of Key Performance Indicators (KPIs).
- **Stage 2: Baseline Environment Analysis** by gathering baseline data (quantitative and qualitative) from individual end users, citizens and stakeholders using surveys, focus groups, apps and information gathered via technological processes.
- **Stage 3: Baseline Data Validation with key stakeholders** reviewing and assessing the usefulness and relevance of the preconditions that were monitored when the actions have been undertaken.
- **Stage 4: Impact Indicators Development** that will be used to assess the performance of HeritACT tools and solutions.

- **Stage 5: Implementation and Calculation of quantitative values for each impact indicator** through tracking systems where sufficient data and metadata will be provided by the task group delivering the module.
- **Stage 6: Refinement of the suggested Impact Assessment Framework** through an iterative process of data collection and validation through the lens of social, economic, technological and environmental factors.

3.2.1 Identification of the expected impacts

In this stage, the expected impacts of HeritACT project are identified in response to the project objectives and the principles of the SDGs, EGD and NEB initiatives. Table 5 presents the project impacts, their scale and significance, as laid out in the proposal and reiterated in the project's Grant Agreement.

Table 5. Project impacts, scale and significance.

IMPACT	SCALE	SIGNIFICANCE	BASELINE
Enabling social participation of people with disabilities	HeritACT pilot cities	20.047 disabled people potentially benefit (10% of the disabled population)	Disabled population of Milan (200,000), Eleusis (374) and Balina (102)
	EU level	>10 million persons (10% of the estimated population)	Current estimation by European Disability Forum[2]
Engagement of students to gain knowledge about sustainability, cultural heritage and other issues	HeritACT pilot cities	> 35.400 students potentially benefit (10% of the estimated number of students)	Student population of Milan (350,000), Eleusis (3720) and Balina (972)
	EU level	Number of students>7 million (10% of the estimated number of students)	Students enrolled in schools and pre-schools in the EU across all education levels[3]
Increase visibility of artists	HeritACT pilot cities	420 artists gain visibility	Number of artists in pilot cities: 5270 Number of artists in Europe: 1,7 million[4]
	EU level	136,000 artists gain visibility	

[2] https://www.edf-feph.org/newsroom-news-how-many-persons-disabilities-live-eu/
[3] https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210427-1
[4] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Culture_statistics_-_cultural_employment

			8% increased visibility enabled by online collaborative platform and crowdfunding[5]
New job opportunities and revenue in the CCI	Europe	168,000 EU CCI revenues increase: 42,54 billion. €	EU CCI employment: 8.4 million persons EU CCI revenues: 709 billion €, Global CCI employment: 29,5 milion persons Global CCI revenues: 2,250 billion €, 2% employment increase (5 years projection) 6% revenues increase (5 years projection)[6]
	CCI Global scale	Employment increase: 590,000 revenue increase: 135.000.000€ per year	
Strengthening of local economies through cultural heritage activation	HeritACT pilot cities	Expected economic return on pilot cities >3 million Euros	Estimated economic return was EUR 5.50 for every EUR 1 invested by the regional authorities[7], Investment on HERITACT pilots = 600,000 €
Enhancing Social Cohesion through the Sharing the of Cultural Heritage	HeritACT pilot cities and Europe	Removal of the barriers that seemingly hinder mutual understanding and communication	Cultural Heritage activation is positively correlated with indicators on freedom over life choices (0.30), job opportunities (0.25), making friends (0.17) and volunteering (0.31)
Environmental impact of NBS solutions	HeritACT pilot cities	27,000 Kg less CO2 Annual mean targets: 15% reduction in NO2, 30% reduction in total VOCs, 40% reduction in PM10 + PM2.5	900 square meters of new green surfaces Improved air quality (-30 Kg CO2 per square meter of implemented solution surface)[8]

[5] https://www2.deloitte.com/ee/en/pages/finance/articles/art-market-increasing-transparency.html
[6] https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/642264/EPRS_BRI(2019)642264_EN.pdf
[7] https://www.espon.eu/sites/default/files/attachments/HERIWELL_Draft%20Final%20Report.pdf#viewer.action=download
[8] https://unalab.eu/system/files/2020-02/d31-nbs-performance-and-impact-monitoring-report2020-02-17.pdf

Improve well being (Based on 15 dimensions of the OECD Better Life Initiative)	HeritACT pilot cities	Reduce by 10% the population with low level of life satisfaction = 20,000 less people with low level of life satisfaction	Number of population in pilot cities:1435000 A significant minority of men (12%) and women (15%) experience low levels of life satisfaction (200,000)[9]

** CCI: Cultural and Creative Industries*

3.2.2 Baseline Environment Analysis

In this stage, the Baseline Environment Analysis is conducted by gathering baseline data (quantitative and qualitative) from individual end users, citizens and stakeholders using surveys, focus groups, apps and information gathered via technological processes. The preliminery data of the baseline Environment Analysis come from the workshops organised by UCD in which all pilot cities have the opprtunity to share their unique contexts and engage in meaningful discussions regarding the specificities of each case study. The potential shared or unique risks and challenges faced by the pilot towns/cities were identified in deliverable D2.2 'Stakeholder requirements analysis and methodological framework'. The results of the Deliverable were further analysed in the context of T3.1 and the related Deliverable 3.1 " Contextual Classification of the Digital Tools". For the purposes of this subsection the resulting codifications are utilized.

Eleusis

The SWOT analysis for Eleusis can be summarised below.

[9] https://www.oecd-ilibrary.org/sites/9870c393-en/index.html?itemId=/content/publication/9870c393-en

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STRENGTHS
Presence of multifunctional spaces.
Ownership by the Ministry of Environment.
Proximity of locations.
Large capacity of spaces.
Connection to intangible cultural heritage.
Existence of active cultural associations.
Ability to attract diverse audiences

WEAKNESSES
Political Challenges
Coordination issues(multiple locations & needs)
Inconsistent funding.
Lack of continuous operation
Insufficient infrastructure
Accessibility challenges from Athens.
Limited availability of cultural spaces.

OPPORTUNITIES
Potential for improving environmental conditions & well-being.
Utilisation of the intangible history associated with the spaces.
Leveraging industrial heritage to develop best practices.
Possibility of industries serving as funders.
Evolution of the ECoC legacy.
Establishment of fully operational cultural spaces.

THREATS
Political obstacles.
Lack of interest leading to underutilization.
Limited accessibility to the city.
General financing challenges for CCIs
Impact of the climate crisis,
Weather conditions affecting the usability of outdoor spaces.

Figure 19. Eleusis SWOT.

Milan

The SWOT analysis for Milan can be summarised as follows:

STRENGTHS
Active and running businesses.
Diverse range of activities including education, farming, and social cohesion

WEAKNESSES
Lack of resources in terms of time, budget, and skills.
Accessibility challenges within the sites and neighbourhood.

OPPORTUNITIES
Established collaborations and potential future collaborations.
Growing interest in the role and activities of Cascine (historic agricultural estates).

THREATS
Accessibility issues for both the sites and the neighbourhood.
Bureaucracy and the protected status of the buildings.
Availability and openness of potential stakeholders.

Figure 20. MIlan SWOT.

Ballina

The SWOT analysis for Ballina can be summarised as follows:

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STRENGTHS
Compact authentic historic town core with built and natural heritage.
Active street frontages with independent retailers and pedestrian permeability.
Engaged stakeholders and voluntary inter-generational groups.

WEAKNESSES
High vacancy levels and dereliction.
Lack of data on tenure and use of properties.
Prevalence of car usage.

OPPORTUNITIES
Mapping data on vacant structures to inform revitalization efforts.
Utilising historic structures and their surroundings for events and installations.
Leveraging shifts in work culture to promote environmental and societal benefits.
Potential for increasing diversity and inclusivity through community engagement.

THREATS
Continued dereliction and potential demolition of historic structures.
Socio-economic stratification within the community.
Increased risk of climate-related damage to the historic core.

Figure 21. Ballina SWOT.

Through the fishbone diagram analysis of D2.2 'Stakeholder requirements analysis and methodological framework', the problem-solving process was enhanced by providing a visual representation of the cause-and-effect relationships for each pilot city. As with the previous section, the information was further analysed in the context of T3.1 and the related Deliverable D3.1.

Eleusis

The core problem, mitigation measures and revised vision of the Eleusis Pilot is represented as follows:

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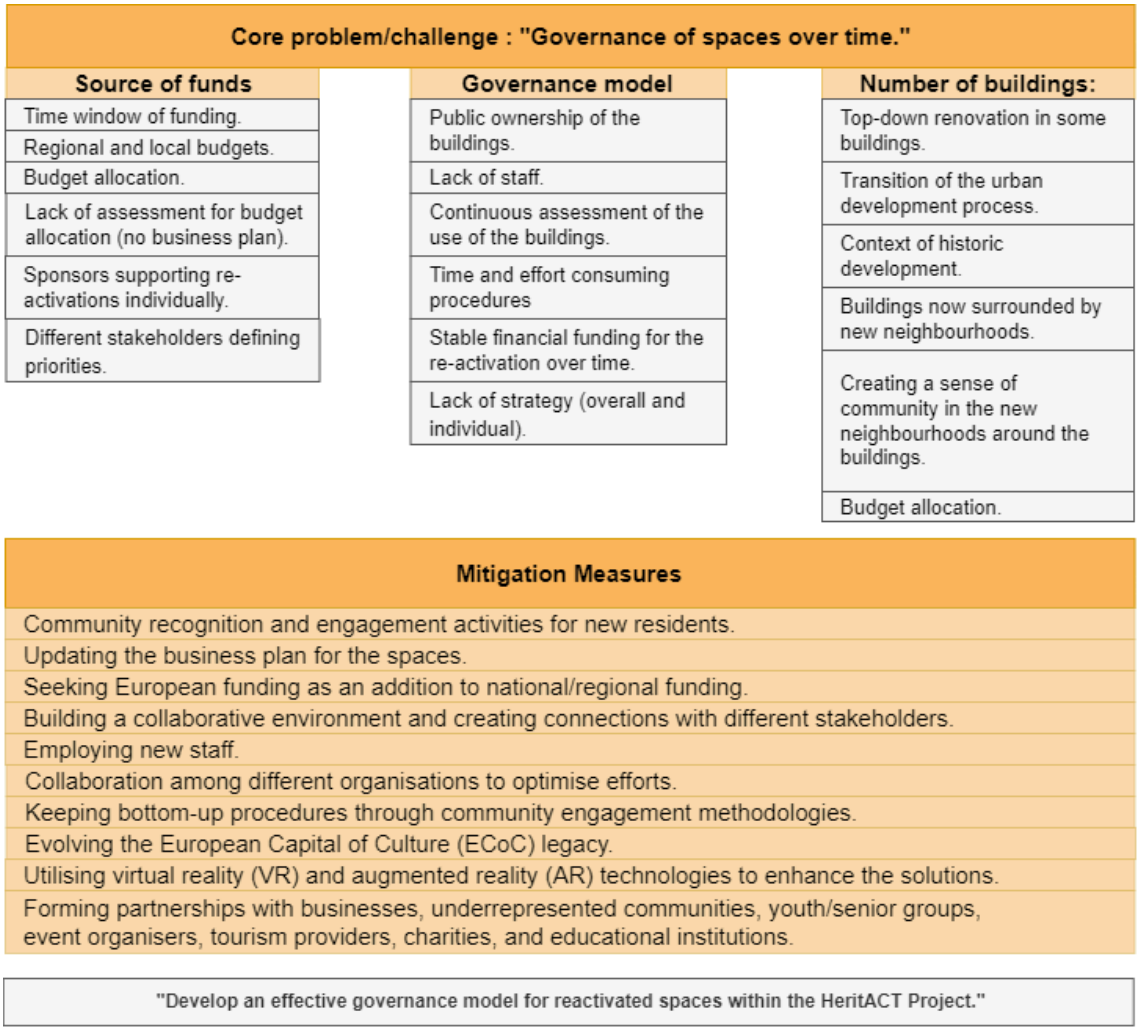

Figure 22. Eleusis Core challenge and Vision.

Milan

The core problem, mitigation measures and revised vision of the Milan Pilot is represented as follows:

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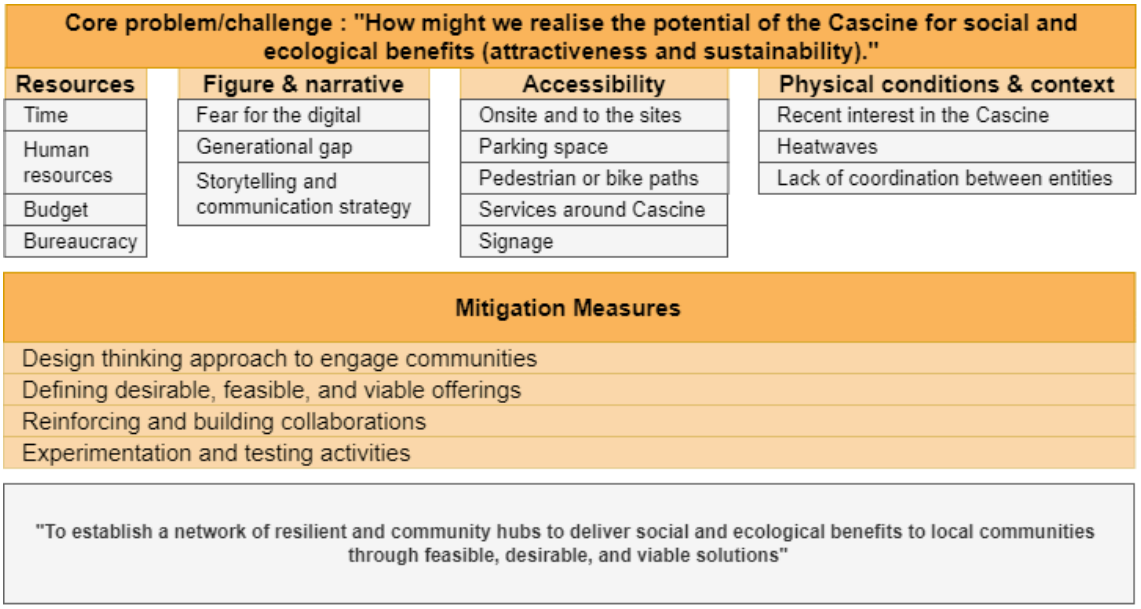

Figure 23. MIlan Core challenge and Vision.

Ballina

The core problem, mitigation measures and revised vision of the Ballina Pilot is represented as follows:

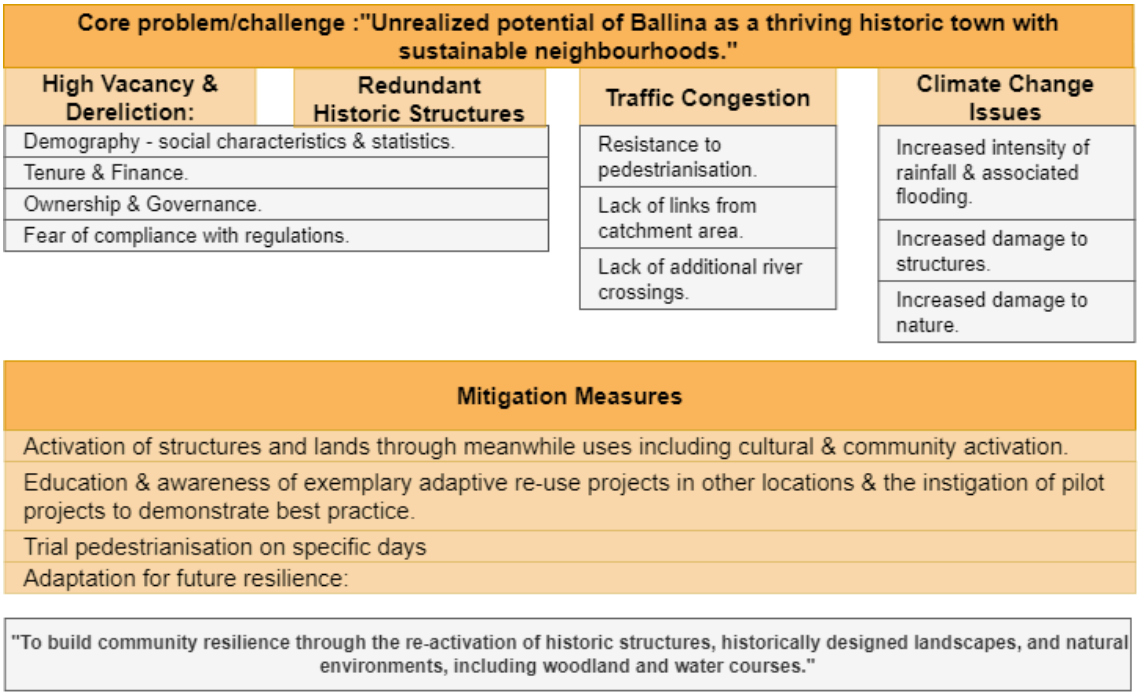

Figure 24. Ballina Core challenge and Vision.

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3.2.3 Baseline Data Validation

This stage includes the process of reviewing and assessing the usefulness and relevance of the preconditions that were monitored when the actions have been undertaken. The codified results are utilized as a preliminary checklist for the baseline data.

At the present state, the information collected in previous sections provides a basis to begin assessing "the usefulness and relevance" of the precondition monitored. The codified results as presented in are proposed as a "checklist" for the data. This involves the broader frameworks analysed in Chapter 1 and the Pilot Conditions presented in the previous subsections.

As the project progresses and the various activities (tool development, solution design, activity planning etc) are described in more detail, the Baseline Data will be re-evaluated in order to incorporate new information and represent changes in any aspect related to the Assessment Framework (i.e., goals, objectives, methods etc).

3.2.4 Impact Indicators Development

This stage summarizes the HeritACT KPIs that will be used to assess the performance of HeritACT tools and solutions. As reiterated in the Grant Agreement, for each of the following call outcome, the project achieves specific contributions with specific target group and specific impact indicators (KPIs).

1. Create innovative architectural and design solutions that emphasise the use of new forms and materials in line with the European Green Deal objectives.
2. Leverage the social function of architecture, arts and design, combining functionality and sustainability with aesthetics, arts and culture, with the aim of driving social inclusion and accessibility, as well as strengthening the contribution of culture to sustainability.
3. Examine cultural transformations driving sustainability and explore new cooperation paths among relevant stakeholders, including cultural and creative industries, interested in designing a new European way of life in line with the New European Bauhaus.

In the context of Call Outcome 1, the project achieves the following contributions:

Contribution 1. Innovative built environment interventions for sustainable urban areas: HeritACT will create public space installations and interventions by employing new spatial concepts, forms and materials, including nature-based solutions, recycled and biomimetic materials, sustainable and innovative techniques (e.g., fabrication) that will promote architectural and urban interventions within EU territories to towards the enhancement of citizens' quality of life. The urban voids and public spaces will provide opportunities for increasing the deployment of new

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solutions relevant to the Green Deal objectives to transform neighbourhoods and cities into sustainable places. Applying innovative design and material solutions to installations produced through participative processes will be a key point in the dissemination of EU's Green deal design principles.

Contribution 2. Customised parametric design and digital fabrication processes for urban small-scale sustainable solutions: Creating optimized design solutions with the use of parametric design and digital manufacturing (DesignYourHeritage, Green Tensegrity Installations and Small-scale Pavilion structures) will demonstrate the potential of these techniques for addressing European Green Deal objectives as well as encouraging digital transition in the public's involvement in urban design solutions. Implementing a digital manufactured NBS (vegetable gardens) in 2 pilot sites will provide architects and local government with a practical example of a solution to increase green areas in the city. Parametric design and digital manufacturing processes will foster its replication and adaptation to different urban and climate contexts. Local artists involved in the collaborative development and implementation of the HeritACT solutions in the pilot sites will acquire knowledge about these digital and cutting-edge technologies and will be encouraged to integrate them in artistic experimentation practices.

Contribution 3. Increased knowledge about techniques for recycling and reusing waste materials: Experimenting with methods and practices to reuse and recycle waste materials for design applications in two pilot sites with the direct involvement of local stakeholders will stimulate the replication of this process in other contexts and for other purposes. Exhibiting the co-created Temporary structures from recycled material in the HERITAGE sites will contribute to accelerate the mind shift of architects and artists toward the use of resource efficient and circular materials for building renovations and artistic installations. Showcasing actual applications of recycling and reusing practices will also raise the awareness of citizens about the utility of improving their waste separation and collection practices, fostering a behavioral change towards more sustainable habits.

In the context of Call Outcome 2, the project achieves the following contributions:

Contribution 1. Synergetic processes for social inclusion and accessibility for "all": HeritACT will enable and enhance citizens' participation and engagement with aesthetics, arts and culture through the HeritACT digital toolkit and open cultural-awareness and creative activities/practices, such as co-design workshops and processes, participatory mapping, crowdfunding platform, generating open dialogue, collaboration with local community and stakeholders on co-creating the urban built environment, valorizing traditional skills and reusing of existing local assets. Direct involvement of civil society in the activation of cultural heritage with

the engagement of local communities in the conservation, regeneration, and care of cultural heritage through the co-implementation of solutions and events to increase the livability of places and their social attractiveness. The installations' central role in the process of urban activation and regeneration will be a major materialization in terms of EU's policies on design and public space.

Contribution 2. Innovative AR/VR and Projection Mapping technologies for experience enhancement, inclusion, and accessibility: HeritACT will develop innovative VR/AR and Projection Mapping technology applications to enrich sensory experiences in several different scenarios of human space interaction. In this regard the immersive experience of the proposed virtual exhibition-archive solution will instil a sense of belonging and inclusiveness in people who share a common background with the theme of the exhibition. An expected outcome of a different application, namely the 'interactive projection mapping on the kinetic wall' solution, is also the enhancement of visitors' perception of inclusion into the projection's theme and visual and sound. The VR applications of the HeritACT project will be available to people unable to access the actual exhibition space, due to various disabilities, age, and various physical and spatial constraints, to ensure inclusiveness, and to maximize the activities' global visibility and impact. The HeritACT's VR /AR applications are also expected to enrich the experience of people with sensory limitations though the development of enriched human-to-place interaction applications. Most of the solutions that will be developed will be open-source and can be adapted to different contexts.

Contribution 3. Social interactions and wellbeing through collaborative "Farm to Fork" strategies and local practices: The activities with stakeholders of the target group for co-creating/co-activating a vegetable garden will trigger the building of a new community of people from different demographic segments who share a common interest in the HERITAGE network and about gardening, agri-food cultivation and gastronomy. Thanks to the knowledge and experience acquired during co-creation activities, the local community will be able to foster the replication of the solution in other spaces of the heritage network and to keep active the gardening and gastronomy related activities beyond the duration of the project (gastronomy culture as driver of sustainability). The activities carried out around the solution will protect the heritage site from abandoning practices, raise citizens awareness about the Farm to Fork strategy of the European Green Deal showing a possible pathway for its achievement, and offer a fair and open program of activities for social interactions.

Contribution 4. Digital gamification for youth engagement in design-decision processes: Using a digital enabler that includes a gamification strategy will foster the participation of young people in the co-design process. HeritACT will promote the use of digital gamification (DesignYourHeritage, HERIcraft) as a new innovative tool

for raising their awareness about NEB principles and European Green Deal objectives and fostering their environmental education through exploring the sustainability impact of implemented solutions. Exploring the HERITAGE network in a 3D environment will increase their sense of belonging to a shared cultural HERITAGE.

Contribution 5. Experience-driven design for social inclusion and accessibility: HeritACT will develop a dedicated tool for the collection, analysis and visualization of data positive experience about citizen experience and emotions in a variety of scenarios and contexts combining physiological measures with traditional methods. The application of UserSense during the pilot studies will allow the assessment of architectural and design solutions over time, tracking of citizens' emotions during staged events, and emotional mapping of urban areas. A rich dataset of experiences matching people's needs will be generated to provide deep insight into the effect of public interventions on citizens' daily life and expectations towards a more participatory, sustainable and inclusive public space.

In the context of Call Outcome 3, the project achieves the following contributions:

Contribution 1. HERITHUBS as a means to foster interdisciplinary activities and networking: HERITHUBS will offer a space for cultural and artistic practices and social initiatives that involve citizens, artists, scientists and public authorities with common interests in heritage, sustainability and NEB principles. HERITHUB will stimulate interactions, paving the way towards new collaborations among different disciplines that may end up in the creation of new endeavors in line with the New European Bauhaus. The implementation of HERITHUBS in three different geographic contexts will also promote the transnational collaboration of artists, scientists and architects working on the same topic of HERITAGE reactivation.

Contribution 2. Students as agents of transformation and ambassadors of New European Bauhaus principles: The HeritACT open platform will act as a transformation agent, providing the ability through to gather students' perspectives and provide low-barrier and inclusive modes for digital participation and collaboration on a pan-European level. Students will share their visions, expectations and critique regarding the New European Bauhaus and the role that art, design and higher education should play in this initiative. Students in art and design, will play a decisive role in shaping a European approach to fostering sustainable entrepreneurship. They will be able to present their visions and work along with artist, designers and architects for a sustainable, inclusive, and aesthetic future and set the agenda for their input to the New European Bauhaus initiative.

Contribution 3. Adaptive reuse of existing buildings for sustainable urban regeneration: HeritACT will use the built cultural heritage as a means for urban regeneration in pilot cities. Rather than using a traditional preservation-centered

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narrative, in which the safeguarding of cultural heritage is the final objective, HeritACT will use a new narrative, in which cultural heritage is more a tool and instrument to reach NEB and Green Deal objectives. During the project, abandoned heritage buildings or are no longer functioning with their original use, can be repurposed to preserve their significance, reinvent places to meet and share and remain part of community legacy after the project's end.

As depicted in Table 6, for each project contribution there are specific KPIs, which are described together with their target value and target group.

Table 6. HeritACT Impact Indicators.

Call Outcome 1: Create innovative architectural and design solutions that emphasise the use of new forms and materials in line with the European Green Deal objectives.			
Contribution	**KPI**	**KPI target value**	**Target Group**
Innovative built environment interventions for sustainable urban areas	Number of Nature Based Solutions adoption in urban spaces addressing one or more European Green Deal objectives	>6 in total of the project	Public authorities, Construction sector, Communities and organizations of Urban Planners and Architects, General public, Scientists, Environmental associations, Local microfauna specialists
	Number of new forms	>4 in total of the project	
	Number of new materials	>3 in total of the project	
	Increased potential for cultivation surfaces implementation in the HERITAGE site	+25% of vertical surfaces of the HERITAGE site	
	Increased potential for permeable surfaces implementation in the HERITAGE site	+25% of vertical surfaces of the HERITAGE site	
Customised parametric design and digital	Number of HERITACT solutions developed using parametric	>3	Cultural and Artistic community, Architects, Designers

fabrication processes for urban small-scale sustainable solutions	design and digital manufacturing techniques		
	Number of artists, architects and designers participating in co-creation of HERITACT solutions developed with advanced manufacturing and parametric design techniques	>27	
	Number of experimentation practices making use of digital manufacturing and parametric design techniques	>7 in total during the project lifetime	
Increased knowledge about techniques for recycling and reusing waste materials	Amount of waste reused or recycled for the co-creation of HERITACT solutions	>kg or kg/m^2	General public, Citizens associations, General Cultural and Artistic community, Architects and Designers community
	Increased waste separation and collection practices among the local community involved in HERITACT activities	+30%	
	Number of workshops involving local artists, architects and designers	>1 per pilot where the solution is implemented	
	Number of artists, architects and designers participating in	>15	

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	co-creation of HERITACT solutions developed with waste material		
	Number of citizens participating in the co-creation of HERITACT solutions developed with waste material	>200	
	Number of experimentation practices making use of recycling and reusing waste materials techniques	>2	

Call Outcome 2: Leverage the social function of architecture, arts and design, combining functionality and sustainability with aesthetics, arts and culture, with the aim of driving social inclusion and accessibility, as well as strengthening the contribution of culture to sustainability.			
Contribution	**KPI**	**KPI target value**	**Target Group**
Synergetic processes for social inclusion and accessibility for "all"	Increase of citizens participating in cultural and creative initiatives, industry and production	> +25%	Citizens, Public authorities, NGOs, CCIs, volunteering associations, social experts
	Number of artists hosted/promoted through the HERITACT pilots	>120 in total	
	Percentage of improved sense of belonging to the HERITAGE network among the local community involved in the HERITACT activities	+75%	
Innovative AR/VR and Projection	Number of HERITACT thematics developed	>12	Cultural and Artistic community, Architects, Designers, Scientists, Local

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Mapping technologies for experience enhancement, inclusion, and accessibility	using AR/VR and Projection Mapping		communities, the general public, people with disabilities, people in other cities and countries
	Number of remotely assisted events	> 3	
	Number of scientists, architects, artists and designers participating in the co-creation of HERITACT solutions developed with AR/ VR and Projection Mapping	>12	
	Number of people with disabilities to use VR application	> 200	
Social interactions and wellbeing through collaborative "Farm to Fork" strategies and local practices	Number of initiatives and events related to the solutions that increase the understanding of the Farm to Fork strategy	>1 per pilot where the solution is implemented	General public/Citizens associations, Local farmers, Experts in Botany, Agri-food and Gastronomy, Public authorities (e.g., green infrastructure department)
	Number of new edible species cultivated in the heritage networks	>6 per pilot where the solution is implemented	
	Percentage of adoption of sustainable food consumption habits among the local community involved in HERITACT activities	+30%	
	Number of demographic segmentations involved in the	>3 age segments, >2 ethnicities , >2 levels of education	

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	co-creation/co-activation activities		
Digital gamification for youth engagement in design-decision processes Using	Number of young people (<18 years) participating in activities with the tool	>30 per pilot	General public/Citizens associations
	Percentage of increased awareness of the engaged community about NEB principles and European Green Deal objectives	+30%	
	Number of players remotely engaging with the tool	>150	
Experience-driven design for social inclusion and accessibility	% of users with disabilities during pilot events	> 80%	general public, researchers, CCIs
	No. of public interventions evaluated for user experience	> 8	
	Emotional mapping of neighbourhoods in pilot cities	> 3	

Call Outcome 3: Examine cultural transformations driving sustainability and explore new cooperation paths among relevant stakeholders, including cultural and creative industries, interested in designing a new European way of life in line with the New European Bauhaus

Contribution	KPI	KPI target value	Target Group
HERITHUBS as a means to foster interdisciplinary activities and networking	Number of co-creative workshops aimed at entrepreneurs taking place in the HERITHUBs	>1 per pilot per year	Cultural and Artistic community, Scientific community, public authorities

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	Number of disciplines involved in HERITHUBS' activities	>5	
	Number of transnational workshops involving artists from different pilot countries	>3 with at least 2 pilot countries representatives	
Students as agents of transformation and ambassadors of New European Bauhaus principles	Number of students involved	>160	Teachers, Students, Academia, Artists, Architects, Designers
	Number of schools involved	>16	
	Number of architect, art and design academia faculties involved	> 6	
	Number of architectural studios	>3	
Adaptive reuse of existing buildings for sustainable urban regeneration	Number of heritage buildings and sites to be reused	>9	Local communities, Heritage organizations, Local Authorities, Architecture and design studios
	Number of buildings saved from ruin or loss	>3	

3.2.5 Implementation and Calculation of quantitative values

Implementation and Calculation of quantitative values for each impact indicator through tracking systems where sufficient data and metadata will be provided by the task group delivering the module.

As mentioned in subsection 3.2.4. the actions related step will be revisited in parallel with the baseline data validation. Once a clearer definition of the framework for the specific assessment is achieved – the Quantitative values outlined in subsection 3.2.4

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will be reviewed and if necessary adjusted to reflect future progress or new information available.

3.2.6 Refinement of the suggested Impact Assessment Framework

Refinement of the suggested Impact Assessment Framework through an iterative process of data collection and validation through the lens of social, economic, technological and environmental factors.

The actions related to the specific step will be continuous throughout the lifetime of the project. The goal is to provide a "living document" to assist the Imp-act Assessment Framework while at the same time incorporating the lessons learned in the further elaboration and refinement of the proposed framework. In this sense, the Impact Assessment and Validation Framework outlined in the present Deliverable will be further developed utilizing inputs from all phases of the HeritACT Project's lifecycle.

3.3 Discussion and Collected Data

The present section collects and summarizes the elements that constitute the proposed Impact Assessment Framework. These include:

- Expected Impacts
- Baseline Condition and Data
- Expected Call Outcomes and KPIs

A further specific finding of the present chapter is that certain steps required in order to provide a comprehensive and robust IAVF require additional information that will be available in the later stages of the project. This leads to the definition of the present Deliverable as a "living document" which is structured in such a way that allows for further elaboration and specialization in future iterations. This will be further analysed in the conclusion chapter.

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4/ Conclusions

The present Deliverable reported on the activities carried out in the context of T6.1 which involves the development of the HeritACT Project's Impact Assessment and Validation Framework.

Three main avenues of research were pursued, and the results presented in the corresponding chapters:

- Context – A collection and analysis of the broader goals and objectives within which the Impact Assessment will take place. These involved the broad HeritACT Project Goals as well as the SDG, EGD and NEB Frameworks
- Impact Assessment Methodology – The method and main concepts involved in the process of Impact Assessment, the role of Cultural heritage as well as the structure and definition of the actions involved were presented and discussed.
- HeritACT IAVF Outline – The specific steps that articulate the proposed IAVF Model are discussed and mapped to available data. Specific steps where additional input from future stages is required are identified.

Returning to the definition given in the Task Description the HERITACT validation and impact assessment framework, the data collected provides.

- A frame of reference for monitoring the results of the project as well as the broader social, economic and environmental outcomes and impacts.
- A set of initial goals, objectives, priorities and specific KPIs for structuring a set of representative indicators for assessing the project intervention success during the demonstration activities and impact thereafter.

As has been highlighted in multiple occasions, the objectives of the present Deliverable necessitate taking into Tasks and actions scheduled for a later date (i.e. solution deployment, engagement activities etc). This requires a certain level of abstraction in the descriptions offered here regarding the proposed IAVF Framework as well as an identification of future actions for elaborating the model. Future actions regarding the related Task involve:

- Working with WP6 Partners for utilizing results of the present deliverable in their work
- Collaboration with stakeholders of specific KPIs to elaborate the assessment framework on a case-by-case basis.
- Incorporation of revisions and elaborations in future versions of the present Document.

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