Social, Economic and Environmental Impacts of SHAFE

Willeke van Staalduinen, Lucia Thielman (AFEdemy), Carina Dantas (SHINE 2Europe), Luiza Spiru, Cosmina Paul (ASLAN)

1. Introduction

The Smart Healthy Age-Friendly Environments (SHAFE) concept was launched in Europe in 2017. Since then, it has attracted many scientists, policymakers, civil society organisations and public authorities to collaborate and further develop the concept. SHAFE was approved as a voluntary Thematic Network of DG SANTE of the European Union and gathered 160 organisations and networks in 2018. It turned into a Stakeholders Network and became a COST Action with over 700 members from 51 countries (2020-2024). After 2024, SHAFE will proceed by integrating the members and results in the works of the SHAFE Foundation[1]. SHAFE is also exploited and further developed within several EU-funded projects, such as the Coordination and Support Action SIRENE, co-funded under the Horizon Europe programme.

SHAFE stands for realising digital and healthy social and physical environments for citizens of all ages to foster healthy lives and well-being. SHAFE has a holistic approach and aims to combine the design and building of social and physical living environments with digital solutions based on a person-centred approach at local or regional levels to promote health, wellbeing, community empowerment and a sustainable environment. SHAFE has its inspiration in the World Health Organization (WHO) concept of age-friendly cities and communities (AFE), launched in 2007[2]. Promoting age-friendly environments (AFE) is an effective approach to address the challenges related to demographic change. While there have been many AFE solutions implemented across Europe, there is a widespread lack of awareness and know-how within local and regional authorities on the value and mechanisms of self-assessing the impact of AFE initiatives so that they can be monitored and improved and more effectively scaled and transferred to other localities and regions.

SHAFE realisation would best mature in local or regional ecosystems, where public authorities, academia, businesses/civil society organisations and citizens collaborate.

[1] www.shafe.eu

[2] https://extranet.who.int/agefriendlyworld/age-friendly-cities-framework/

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SHAFE facilitators could be social innovators who fully understand the local or regional situation, can bring parties together and are result-oriented. Public authorities play an important role in the realisation and implementation of SHAFE, either as facilitators, bringing together stakeholders and the administrative pillars of policymaking, creating awareness and support or as well as financers of its implementation. One of the main questions, however, remains and that is: what are the benefits of SHAFE, and how can we measure them? How can you define the impact of SHAFE, and who and what will be impacted?

2. SHAFE SEE-IT

In 2015, the AFE-INNOVNET project, funded by the European CIP programme, delivered the **Social Economic Environmental Impact Tool** (SEE-IT). This tool enables national, local and regional authorities to do better ex ante and ex post evaluations of age-friendly environments innovations. With SEE-IT, a conceptual framework was provided that can support cyclic, iterative processes of improvement and fine-tuning. Also, SEE-IT could be used as a tool for a co-design partnership that creates support among stakeholders and others.

As the SEE-IT considers the holistic approach of age-friendly environments on social, economic and environmental impacts, the connection with SHAFE is a perfect match. Therefore, we value the SEE-IT as an adequate tool to follow to perform ex-ante and ex-post evaluations on SHAFE measures, programmes, projects or initiatives. The tool enables SHAFE facilitators to organise, assess and analyse the potential impacts of smart healthy age-friendly environments and provides the inclusion of multiple stakeholders, including individual citizens.

Therefore, the SEE-IT has been revisited and transformed into the SHAFE SEE-IT.
The main author of this article considered many elements of the SEE-IT and decided to keep the cycle of working and the possible impact considerations. Where needed and feasible, the SHAFE SEE-IT has been adapted to achieve a more practical approach that is usable for larger groups of developers, policymakers and facilitators. The SHAFE SEE-IT was tested during the COST Action NET4Age-Friendly Training School in Skopje (26-28 September 2023 | 30 participants) and during the NET4Age-Friendly webinar on October 17th | 32 participants. Based on the findings, the SHAFE SEE-IT was further adapted and refined by the authors.

The SHAFE SEE-IT considers the potential impacts of all solutions within the frame of smart healthy age-friendly environments. This could imply broad programmes, such as the revitalisation of communities (construction and social structure) or healthy lifestyles and prevention agendas. Also, smaller-scale initiatives and projects such as digital apps for social connectedness, social workers and coaches in neighbourhoods, home and infrastructure construction and adaptations fit into the SHAFE approach and impact considerations. The SHAFE SEE-IT impacts citizens of all ages, the scope of impact assessments using the tool is only limited by the geographical level or predefined target group(s) of the programme or initiative.

3. SHAFE SEE-IT assessment process

The SHAFE SEE-IT process foresees 5 steps to perform the ex-ante or ex-post evaluations.

1. AIM: bringing the group together and defining the problem, the aim and objectives of what the SHAFE initiative, programme, and project should achieve.
2. SCOPE: defining the assessment's purpose and the current situation's zero baseline.
3. ASSESSMENT: phase to consider appropriate impacts in the social, economic or environmental domain.
4. ANALYSIS: analysing the assessment findings.
5. RESULTS: defining and presenting the results.

In the following sections, the steps will be further explained. The example of impact assessment of promoting a healthy lifestyle will demonstrate the process. Please be aware that the assessment is simplified to illustrate the working of the SHAFE SEE-IT as such.

AIM

The first step in de process of SHAFE SEE-IT is to bring together the group of stakeholders for the impact assessment. Based on the programme, project or initiative, the group of stakeholders will be defined and invited. A diverse group of stakeholders, consisting of representatives of citizens, science, businesses and public authorities, is most appropriate for the assessment. It is recommended to consider the level of awareness raising and support that the impact assessment can achieve as this will be helpful for the future of the programme, project or initiative.

Programme: the improvement of a healthy lifestyle of citizens in City A. Project: realisation of accessible and walkable outdoor environments. Stakeholders: citizens of all ages, shop owners in shopping areas, local university, local authority: health and prevention, urban planning and infrastructure.

The group meeting starts with identifying the core problem and defining the aim and the objectives the group wants to achieve. This is the most critical part of the SHAFE SEE-IT process as it sets the overall direction and extent for the impact assessment exercise.

Core problem: a growing number of people with overweight due to sedentary lives and unhealthy food consumption. Main aim: reduce the number of people with overweight and support a healthy lifestyle. Specific objectives: (1) To improve the walkability in the neighbourhood. (2) To promote walking. (3) To strengthen social participation in the neighbourhood.

SCOPE

The second step is the definition of the SCOPE of the assessment. Who, what and when will be assessed? The SCOPE starts with the definition of the current situation, the so-called zero-base situation. Additionally, the possible solutions are defined.

Zero-base situation: The neighbourhood counts 17,000 inhabitants living in 5,000 households. The neighbourhood is about 30 years old. When the neighbourhood was built, many young families moved to it. Nowadays, the neighbourhood is mainly inhabited by people who work outside the neighbourhood and pensioners. 15% are children and adolescents, 25% are over 65. Diabetes 2 affects 10 out of 100 older adults.

The number of cars is 7,000. The offer of public transport has been decreased to 1 bus per hour and it only drives from the shopping mall to the centre of the city. The available infrastructure is strongly focused on cars. Walking and cycling are therefore hardly feasible in the neighbourhood. The neighbourhood counts 10 fast food restaurants that have in total 1,000 customers each day.
Solutions: (1) Restructuring of the infrastructure to give space to walking and cycling by providing broader sideways. (2) Create a walking promotion bonus system by providing free tickets for theatres, playgrounds, and cinemas. (3) Create community groups for walking and joint healthy cooking.

ASSESSMENT

For the assessment phase, we will make use of the lists of potential social, economic and environmental impacts that are presented in the Annex. We assess which impacts are appropriate, and then we jointly define the consequences of these impacts. Thereto we make a list of the impacts.
Next step is to assess the identified impacts by answering the following questions:

1. What is the direction of the impact: is it positive, neutral or negative? This question aims to find the answers from the group on the working of the impact in the sense of positive or negative effects. Impacts can also have negative effects.
2. What is the intensity of the impact: neutral, strong, very strong? When the direction has been defined, the following question is to define the level of the effect.
3. Who or what is directly or indirectly impacted? Directly impacted are those people or things that immediately will experience the consequences of the solution in their budget, behaviour, opportunities and so on. For example: tax reduction for citizens directly impacts citizens who pay taxes. They will pay less taxes because of the measure. Indirectly impacted are those people or things who will experience a side-effect from the solution. For example: tax reduction will lead to less public budgets with which fewer roads and schools are built. Indirectly impacted are car drivers and children.
4. What is the quantification or monetisation of the impact? This question will be further explained below.

The team of our example defines a series of impacts from the lists in the Annex:

- Social
  - Health & longevity
  - Meaning & inclusivity
  - Quality of social interactions
- Economic
  - Public budgets
  - Sustainable consumption & production
- Environmental:
  - The natural environment
  - Culture, heritage & leisure
  - Settlement

Impact	Direction	Intensity	Indirect/direct
Health&longevity	Positive	Strong	Citizens – direct
Meaning&inclusivity	Positive	Very strong	Citizens – direct
Social interactions	Positive	Neutral/strong	Citizens – indirect
Public budgets	Negative	Strong	Tax and public administration – direct
Consumption/production	Positive	Neutral	Households and restaurants – direct
Natural environment	Positive	Neutral	Living environment – direct
Culture/leisure/heritage	Neutral	Neutral	Change of habits – direct
Settlement	Neutral	Neutral	Urban setting – direct

Table 1: Direction, intensity and direct impacts

The next step in stage 3 is monetising or quantifying the impacts. The list below indicates the ways and methods to calculate potential impacts. When performing an impact assessment, the team can choose which figures they want to use, also related to the available data and databases.

- **Scale and significance**
  - Scale: how widespread the outcomes and impacts are likely to be. It can be measured by different criteria, such as the number of people or entities affected, the magnitude or intensity of the change, the duration or persistence of the change.
  - Significance: the importance, or value, of those benefits. For example, a new law may positively impact workers' health and safety, but its significance varies depending on how workers value their health and safety and how the law is enforced.

- **Monetisation of non-market impacts**
  - Link the impact to market prices, such as a decrease or increase in hospital admissions or medicine = X €. If market prices are not available, the impact can also be linked to the willingness to pay or the willingness to accept a lower quality or risk.

- **Costs of the initiative, project or programme**
  - Setup (initial investments), operational costs (maintenance and services, annual costs of funds, capital investment) and administrative burden (overhead and management costs)

- **Gains and losses**
  - Direct market gains/revenues/losses: changes to patterns and volumes in hospital admissions, medicine usage, home support
  - Indirect market gains/revenues/losses: neighbourhood or housing valuation, number of transport/mobility
  - Total gains/losses over a period: aggregation of gains/losses

- **Non-monetary approaches**
  - **Quality Adjusted Life Years** (QALY): a year of life in perfect health is counted as 1.0.
    For example, if a patient lived in a situation with a utility of 0.5 or 0.5 QALYs, that person is only experiencing 50% of the possible value of that year. The patient living in less than perfect health for a period of time of one year is valued as much as the value of living half a year in perfect health. An intervention results in a patient living for four extra years rather than dying within one year. In this case, their quality of life would have dropped from 1 to 0.6. The following formula would be generated (LINK):
    - 4 years of extra life with a quality of life of 0.6 = 2.4
    - Reduced quality of life in less than 1 year (1 – 0.6)= 0.4
    - QALY value after the intervention = 2.0
  - **Disability Adjusted Life Years** (DALY): counted as years lost. According to the WHO, DALY represents the loss of the equivalent of one year of full health. DALYs for a disease or health condition are the sum of the years of life lost due to premature mortality (YLLs) and the years lived with a disability (YLDs) due to prevalent cases of the disease or health condition in a population. LINK
  - **Healthy Life Years** (HLY): measures the number of quality-adjusted remaining life years per person. Eurostat defined the Healthy life years in the EU at 64.2 years for women and 63.1 years for men in 2021. LINK

- **Monetary approaches**
  - **Cost of Illness** (COI): medical expenses related to illness. The OECD estimates the expenditure by Disease, Age and Gender: LINK
  - **Human Capital**: the eventual loss of future earnings. The Journal of Statistics in Society published in 2008 an illustration of the multiplier-multiplicand method that is often used to calculate the loss of future earnings. LINK

- **Preference Based approaches**
  - Value of Statistical Life (VOSL): an economic value on willingness to accept higher or lower levels of risk or how much society would be willing to spend to prevent one unidentified death. A systematic review in 2019 for VSL showed a large variation, depending mainly on the context rather than the method used. LINK
  - Value of Statistical Life Year (VOLY): increase of one additional year of life expectancy. This does not say anything about the quality of life.

- **Life Cycle Assessment approach** (LCA): evaluating a product or service's effects on the environment over the entire period of its life. The so-called life cycle costing (LCC) is supported by the European Commission and provides Green business LCC tools on computers and monitors, imaging equipment, indoor lighting, outdoor lighting and vending machines. LINK

Useful databases

- Eurostat: https://ec.europa.eu/eurostat
- European data portal: https://data.europa.eu/en
- World Health Organization, The Global Health Observatory: https://www.who.int/data/gho
- Organisation for Economic Co-operation and Development: https://www.oecd.org/
- United Nations Data: https://data.un.org/
- United Nations Sustainability Development Goals: https://unstats.un.org/sdgs/dataportal
- Municipal, regional and national databases

ANALYSIS

The fourth stage is the analysis of the found impacts. The goal of this stage is to come to a robust conclusion regarding the impacts. If the group is still uncertain of the joint results, the process should be reconsidered. The findings of stage 3 are under consideration in this stage. The found impacts are compared by weighing them, and defining the options they provide. Also, we analyse which groups of the population, which sectors and which geographical areas are most impacted. Finally, we analyse if the available data is sufficient to draw a robust conclusion.

RESULTS PRESENTATION

The final stage of the impact assessment is to present the team' results to the bigger audience, public authorities, initiators or other stakeholders.

4. Conclusions

The SHAFE SEE-IT is a supportive tool for everyone who wants to perform ex-ante or ex-post evaluations on projects, programmes or initiatives to realise SHAFE. It suggests an impact assessment process in which is defined who and what is impacted, the direction and intensity. Indicators are provided to analyse the impacts in terms of monetisation or quantification.

Besides the fact that SHAFE is supportive to define the results of impacts, other positive results are the stakeholder involvement by working in a diverse team and to jointly become aware of the impacts of potential solutions and to make choices.

References

- Rodd Bond, Mereia Ferri Sanz, Willeke van Staalduinen, Jordi Garcés Ferrer, Menno Hinkema, D4.2 – Methodology and indicators for LRAs to assess socio-eco impact of investing in AFE developed in coordination with WHO Europe technical work. A protocol for European Regions, Local Authorities, and Communities. Social, Economic and Environmental Impact Tool (SEE-IT), online available https://cordis.europa.eu/docs/projects/cnect/8/620978/080/deliverables/002-AFEINNOVNETD42FINAL.pdf, accessed d.d. 16.11.2023.
- Ferri Sanz, M., Garcés Ferrer, J., van Staalduinen, W., Bond, R., Hinkema, M. (2018). Evaluating Socio-economic Impact of Age-Friendly Environments. In: Zaidi, A., Harper, S.,

Howse, K., Lamura, G., Perek-Białas, J. (eds) Building Evidence for Active Ageing Policies. Palgrave Macmillan, Singapore. https://doi.org/10.1007/978-981-10-6017-5_7

- NET4Age-Friendly, Willeke van Staalduinen, webinar 17.10.2023: https://www.net4age.eu/impacts-shafe-video.

ANNEX

Domains of social impact	Possible impacts for consideration
Health & longevity 	Does the solution support a healthy lifestyle and/or increase life expectancy? Consider the following potential impacts: • Increasing physical activities • Improving mobility • Preventing falls • Improving mental wellbeing • Preventing chronic diseases
Safety 	Have all safety aspects of the solution been taken into account? This includes: • Safety indoors • Safety outdoors • Data security in digital devices and services
Meaning & inclusivity 	Is the initiative meaningful and inclusive? Were the following topics considered: • Employment and voluntary work • Enabling / improving informal care • Respect for different perspectives and lifestyles • Social inclusion • Opportunities for leisure
Education & lifelong learning 	Does the solution pertain to education (levels) in any way? Is it equally accessible for all people? Think of: • Literacy (health, digital, data) skills • Access to higher education • Educational attainment • Opportunities for lifelong learning
Quality of social interactions 	Have social interactions been taken into account? How does the solution relate to: • Social networks and friends • Loneliness and isolation • Social and religious participation • The impact of migration, ethnicity and/or language on the individual and on society

Private & family life 	Have impacts been considered on all levels of life? • Impacts on individuals • Impacts on households • Impacts on families
Personal data 	Does the solution make use of data? Consider the following topics: • Access to information • Safe-guarding identity and regulating identifiers • Protection of data and the sharing of information
Basic rights & responsibilities 	Have all basic rights been taken into account? Such as: • Human dignity • Equality • Freedoms • Justice • Solidarity • Citizens' rights (EU Charter of Fundamental Rights)

Domains of economic impact	**Possible impacts for consideration**
Standards of living 	Does the solution account for the basic standards of living? • Financial means should be sufficient to cover the basic needs of living • Appropriate housing should be available and accessible
Economic prosperity 	Does the solution pertain to economic prosperity in the following fields? • Gross national / regional income • Number of employed / unemployed people • Household savings
Public budgets 	Are there public budgets involved? Such as those for: • Community support • Health and social care • Information and communication • Education • Transport • Public services
Market mechanisms 	How does the solution impact the market? What are the effects on: • Private sector business opportunities / SMEs • Private social enterprise opportunities • Transactions between sectors
Innovation & R&D 	What are the expected outcomes in research and development? Are these topics involved: • Investment in R&D • Intellectual property • Accelerated time to market

Sustainable consumption & production 	Does the solution fit sustainability standards in the following areas? • Household structure and expenditure • Household energy use • Car ownership • Persons at work in private sectors
Property rights 	Are the relevant rules and regulations for property use considered? Does the solution deal with: • Homeownership • Social housing

Domains of environmental impact	**Possible impacts for consideration**
The natural environment 	How does the solution impact the natural environment? Think for instance of: • The quality of the local environment • The nature of environment: urban, rural, suburban • The landscape • Bio-diversity
Culture, heritage & leisure 	What are the potential effects on culture, heritage and leisure activities? Such as: • Availability of cultural assets • Heritage sites • Events / festivals • Opportunities to participate
Land use 	Does the solution make use of land and in what way? • Geographic context • Zoning (agricultural, forestry, marine, industrial, retail, residential, educational, health service, mixed-use) • Conservation
Climate & Energy 	How does the solution impact the climate and/or vice versa? Consider: • Energy conservation • Alternative energy sources • Environmental energy control • Seasonal variation / weather / drainage • Climate change hazards (sea level, heat, cold, floods)
Renewable resources & waste 	Is the solution renewable in any way? Can resources be: • Re-used • Reduced • Recycled

Settlement 	Does the solution deal with settlement issues in the following areas? • Spatial hierarchy • Zoning • Density • Public spaces
Housing 	Does the solution deal with housing in the following areas? • Households by type of accommodation • Quality of housing • Accessibility • Gardens • Heating / Water / Drainage / Electricity / Waste • Internet, broadband
Transport 	Are transportation methods and accessibility important? Think of: • Means / modes of travel • Availability / frequency of transportation • Journey times • Safety