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| ID | Title | Year | Inclusion Criteria | Research Question |
| S1 | **An exploratory study of software sustainability dimensions and characteristics: end user perspectives in the Kingdom of Saudi Arabia (KSA)** | 2018 | Discussion on different dimensions of sustainability and their perceived priorities in software development according to academic and industry experts | RQ3 |
| S2 | **A Collection of Standards-based Recommendations for Sustainable, Social, Accessible Robots and Systems in Public Spaces - A Systematic Review and Derivation of Unified Equality Requirement Descriptions** | 2024 | Listed 83 equality requirements in social dimension for robotic systems in particularly | RQ1 |
| S3 | **WaterWise: Co-optimizing Carbon- and Water-Footprint Toward Environmentally Sustainable Cloud Computing** | 2025 | Provides metrics for measurement of environmental sustainability categories. | RQ1, RQ2 |
| S4 | **Assessing the Role of Software in Sustainability: A Survey of Industry Practices and Research Trends** | 2025 | Lists out green software engineering requirements | RQ1 |
| S5 | **Uncovering sustainability concerns in software product lines** | 2016 | List out categories and metrics for different dimensions (social, economic, technical and environmental) for SPL | RQ1, RQ2 |
| S6 | **Sustainability requirements for connected health applications** | 2017 | Lists out sustainability requirements across different dimensions for healthcare applications | RQ1, RQ3 |
| S7 | **Addressing sustainability in the requirements engineering process: From elicitation to functional decomposition** | 2020 | Provides a framework for sustainability requirement elicitation. Goal approach for mapping them to other system requirements. Also defines categories for different dimensions. | RQ1, RQ2, RQ3 |
| S8 | **On the Importance of Requirements Elicitation Framework to ensure Sustainability in the Digital Education Ecosystems** | 2023 | Provides a sustainability requirement elicitation framework for digital education system. Highlight specific categories of sustainability dimensions. | RQ1, RQ2 |

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| S9 | **Social Sustainability Indicators for Software: Initial**  **Review** | 2014 | Provides a comprehensive list of social sustainability indicators | 2014 |
| S10 | **The role of energy management technologies for cyber resilient smart homes in sustainable urban development** | 2024 | Explores sustainability requirements in the dimension of environment and technical for developing smart home systems | RQ3 |
| S11 | **AI-powered sustainability in smart cities** | 2025 | Provides energy management issues for smart cities and how they can be optimized. | RQ1, RQ2 |
| S12 | **Integration of Deep Learning with Edge Computing on Progression of Societal Innovation in Smart City Infrastructure: A Sustainability Perspective** | 2025 | Lists out sustainability requirements for smart city infrastructure | RQ1, RQ3 |
| S13 | **How Viable Are Energy Savings in Smart Homes? A Call to Embrace Rebound Effects in Sustainable HCI** | 2023 | Environmental sustainability metrics for smart homes | RQ2 |
| S14 | **Sustainable Personalized Home Care for Pandemic Management: A**  **Service-Oriented Approach** | 2025 | Provides sustainability requirements (technical dimension) for healthcare applications | RQ1 |
| S15 | **Towards Sustainability in Buildings: a Case Study on the Impacts of Smart Home Automation Systems** | 2022 | Addresses impact of smart home automation system across sustainability dimensions and categories | RQ1, RQ2 |
| S16 | **Navigating Sustainability and Legal Constraints in Software Engineering for the Battery Industry: A Research Agenda"** | 2025 | Surveys legal and regulatory mandates for software development and features | RQ1, RQ3 |
| S17 | **Toward a Comprehensive Understanding and Evaluation of the Sustainability of E-Health Solutions** | 2023 | Focuses on sustainability constraints for e-health solutions across five dimensions-technology, organization,  economic, social, and resources. | RQ1, RQ2 |
| S18 | **Energy efficiency in software: A case study on sustainability in personal health records** | 2020 | Analysed energy efficiency requirements in personal health record system | RQ1 |
| S19 | **Economic Sustainable Health Information Systems, Interdisciplinary Perspectives on Operations Management and Service Evaluation** | 2021 | Suggested sustainability strategies for public health information systems | RQ1 |
| S20 | **Standards-Based Sustainability Requirements for Healthcare Services in Smart Cities** | 2018 | Provides sustainability requirements for e-health solutions in smart cities across individual, social, environmental,  and technical dimensions | RQ1, RQ2 |
| S21 | **Optimizing Requirements Engineering for Sustainable E-Learning Systems** | 2025 | Integrates sustainability principles for requirement engineering process in e-learning platform | RQ1 |
| S22 | **Sustainability requirements for eLearning systems: a systematic literature review and analysis** | 2019 | Systematic review of ~124 papers; identifies **18 high-level sustainability requirements** for eLearning systems across human, technical, economic, and environmental dimensions. | RQ1, RQ2 |
| S23 | **Individual and Social Requirement Aspects of Sustainable eLearning Systems** | 2017 | Focuses on individual/human and social dimensions of sustainability for e-learning | RQ1 |
| S24 | **Green architecture for sustainable eLearning systems** | 2017 | Proposes sustainable/green architecture designs (especially cloud-based) to reduce energy/storage etc., mapping to sustainability requirements. | RQ1 |
| S25 | **Quality Assurance in E-Learning: A Proposal from Accessibility to Sustainability** | 2022 | Proposes a self-assessment model for quality in virtual education, starting with accessibility and extending to sustainability. Includes criteria, requirements, evidence across dimensions like organization, teaching, infrastructure. | RQ1, RQ2 |
| S26 | **The Role of e-Learning Platforms in a Sustainable Higher Education: A Cross-Continental Analysis of Impact and Utility** | 2025 | Looks at platform adaptability, student engagement, inclusivity; evaluates environmental/social/economic sustainability via student profiles and platform types. | RQ1, RQ2 |
| S27 | **Enhancing Security and Sustainability of e-Learning Software Systems: A Comprehensive Vulnerability Analysis and Recommendations for Stakeholders** | 2023 | Examines security vulnerabilities of popular eLearning platforms (Moodle, Chamilo, Ilias), during different phases (pre/during/post-COVID), and how security concerns interact with sustainability. | RQ1 |
| S28 | **A social and technical sustainability requirements catalogue** | 2023 | Provides a catalogue of social + technical sustainability requirements. It helps developers to be aware of social-sustainability properties when designing software. | RQ1, RQ3 |
| S29 | **Engineering Requirements for Social Sustainability** | 2016 | |  | | --- | |  |  |  | | --- | | Explores how software systems can be required to contribute to well-being of user communities via values like equity, security, education. Proposes “value patterns” that serve as templates for social sustainability requirements | | RQ1 |
| S30 | **Equality Requirements for Software Systems: A Survey** | 2019 | A survey about how “equality” is understood by diverse users, how that translates into requirements statements. Useful to understand how user diversity influences what equality means in software. | RQ1 |
| S31 | **Green Software Quality: A Comprehensive Framework for Sustainable Metrics in Software Development** | 2024 | This paper introduces a comprehensive framework for evaluating Green Software Quality by incorporating sustainability metrics throughout the software development lifecycle. | Metrics, RQ1 |
| S32 | **Eco-programming of industrial robots for sustainable manufacturing via dynamic time scaling of trajectories** | 2023 | Discuss eco-programming techniques for industrial robots to minimize energy consumption | RQ1, RQ3 |
| S33 | **A Taxonomy and Future Directions for Sustainable Cloud Computing: 360 Degree View** | 2017 | Provides an overview of sustainable cloud computing practices. Considered all four main dimensions of sustainability. | Metrics, RQ1, RQ2, RQ3 |
| S34 | **Sustainable Edge Computing: Challenges and Future Directions** | 2023 | Provides energy-efficient and economically viable deployable strategies for cloud systems | RQ1, RQ3 |
| S35 | **Sustainable AI-IoT Systems: Environmental Impact, Green Computing, and Circular Economy Solutions for Digital Transformation** | 2023 | Provides a comprehensive sustainability requirements for modern digital infrastructures, including green software, robotics, cloud, edge, and AI-IoT systems. | RQ1, RQ2, RQ3 |
| S36 | **Performance assessment of an e-learning software system for sustainability** | 2013 | The work assess the performance of an e-learning software system to ensure its teaching and learning quality, contextual relevance and longer operational life to achieve economies of scale | RQ1, RQ3 |
| S37 | **Sustainable Learning Analytics: Measuring and Understanding the Drivers of Energy Consumption of AI in Education** | 2024 | Investigating the energy consumption of various machine learning models commonly employed in learning analytics | RQ1 |
| S38 | **An investigation of social sustainability factors of e-learning systems systems** | 2023 | This study investigates the social dimension factors related to the sustainability of e-learning during the COVID-19 pandemic. | RQ1, RQ2 |
| S39 | **Sustainability in the Field of Software Engineering: A Tertiary Study** | 2025 | This is a tertiary study that reviews 80 systematic reviews on sustainability in software engineering. It maps the current research landscape, finding a strong focus on the environmental dimension (especially energy efficiency) while noting that the Sustainable software engineering: Process and quality models, life cycle, and social aspects, economic, and individual dimensions are underexplored. | RQ1, RQ2s |
| S40 | **Social Sustainability Approaches for a Sustainable Software**  **Product** | 2023 | This paper outlines a research proposal for developing a framework to integrate social sustainability into agile software development. It notes a lack of empirical evidence and concrete approaches for addressing the social dimension of software sustainability. | RQ1, RQ2 |
| S41 | **A Catalogue Supporting Software Sustainability Design** | 2018 | Introduces a sustainability design catalogue (SSDC) comprising a series of guidelines. It aims to assist software developers and managers in eliciting sustainability requirements, and then in measuring and testing software sustainability | RQ1 |
| S42 | **Software Sustainability from A User Perspective A Case Study of A Developing Country (Kingdom of Saudi Arabia)** | 2018 | This paper explores user perspectives on software sustainability and the barriers to its adoption, rather than defining specific technical standards. As a result, it discusses requirements and metrics in general terms without providing a concrete, measurable list. | RQ1 |
| S43 | **Lessons Learned from Developing a Sustainability Awareness Framework for Software Engineering Using Design Sciencean** | 2024 | This paper describes the Sustainability Awareness Framework (SusAF), a tool to help software engineers identify potential sustainability effects. It highlights that defining specific, measurable metrics, particularly for social and individual dimensions, remains a significant challenge. | RQ1 |
| S44 | **A Tertiary Review on Blockchain and Sustainability With Focus on Sustainable Development Goals** | 2022 | This paper analyzes the impact of blockchain technology on the United Nations' 17 Sustainable Development Goals (SDGs). It uses the existing SDGs and their targets as the framework for its analysis of blockchain's positive and negative effects. | RQ3 |
| S45 | **Characterising Sustainability Requirements: A New Species, Red Herring, or Just an Odd Fish?** | 2017 | This paper analyzes how the term "sustainability requirement" is used in academic literature, concluding that it is often used ambiguously and without a clear, shared definition. | RQ1, RQ2 |
| S46 | **A Novel ICT Framework for Sustainable Development Goals** | 2019 | This paper proposes a high-level Information and Communications Technology (ICT) framework for implementing Sustainable Development Goals (SDGs).  It focuses on the structure and components needed to apply existing goals at a local level. | RQ1 |
| S47 | **Entrepreneurship Education and Sustainable**  **Development Goals: A literature Review and**  **a Closer Look at Fragile States and**  **Technology-Enabled Approaches** | 2019 | This article examines how entrepreneurship education and training (EET) can support Sustainable Development Goals (SDGs), especially in fragile states. It outlines requirements for making EET more effective for sustainability. |  |
| S48 | **An analysis of the sustainability goals of digital technology start-ups in Berlin** | 2022 | This paper analyzes the sustainability focus of digital startups in Berlin, arguing that they prioritize economic goals over social and environmental ones. It uses the Sustainable Development KLoals (SDGs) as its primary measurement framework to assess and categorize the startups' contributions to sustainability. | RQ1, RQ3 |
| S49 | **Achieving sustainable performance in a data-driven agriculture supply**  **chain: A review for research and applications** | 2020 | The paper reviews how data-driven approaches can enhance sustainability in agri-food supply chains across three dimensions: social, environmental, and economic. It identifies key performance metrics such as farmer welfare, reduced emissions, minimized food waste, and improved economic viability. | RQ1, RQ2, RQ3 |
| S50 | **Assessing the usability of blockchain for sustainability: Extending key themes to the construction industry** | 2022 | This paper assesses how blockchain technology can be used to achieve sustainability in the construction and real estate sectors. It proposes a framework for integrating blockchain with tools like Building Information Modelling (BIM) and Life Cycle Sustainability Assessment (LCSA) to improve transparency and address environmental, social, and economic impacts. | RQ1, RQ3 |
| S51 | **Eliciting the Double-edged Impact**  **of Digitalisation: a Case Study in Rural Areas** | 2023 | The provided paper is a case study focused on eliciting the positive and negative impacts of digitalization in rural areas. It uses these elicited impacts as a precursor to defining system goals. | RQ1 |
| S52 | **Crowd-Focused Semi-Automated Requirements Engineering for Evolution Towards Sustainability** | 2018 | This paper proposes a platform to help analyze the sustainability impact of software requirements using crowd feedback. It focuses on the *process* of discovering these impacts across several dimension. | RQ1 |
| S53 | **The Diversity Crisis in Software Development** | 2021 | The focus of the article is on the social and human aspects of software development—specifically the challenges and best practices related to diversity and inclusion. | RQ1, RQ2 |
| S54 | **Framing Sustainability as a Property of Software Quality** | 2015 | This paper presents a framework for identifying and analyzing sustainability requirements within specific contexts, illustrated through two case studies: a paper-mill control system and a car-sharing platform. | RQ1, RQ3 |
| S55 | **Methodology Matters: How We Study Socio-Technical Aspects in Software Engineering** | 2019 | This paper analyzes the research methods used in software engineering studies. It finds a heavy reliance on computational analysis of trace data, prioritizing realism and generalizability over controlled studies of human behavior. | RQ1 |
| S56 | **Software Sustainability Matrix - A Formalized Sustainability Assessment Method for Software Requirements** | 2023 | It  proposes the Software Sustainability Matrix (SofSuM), a method for quantitatively assessing the sustainability of software requirements. It transforms a qualitative framework (SusAF) into a quantitative one that calculates various sustainability indicators. | RQ1, RQ2 |
| S57 | **A Systems Thinking Approach to Improve Sustainability in**  **Software Engineering—A Grounded Capability**  **Maturity Framework** | 2023 | This paper presents a comprehensive Software Sustainability Capability Framework (SSCF) to help organizations assess and mature their sustainable software development practices. The framework provides a detailed roadmap, core capabilities, and specific metrics to address the limitations of existing models. | RQ1 |
| S58 | **Surveying the Environmental and Technical Dimensions of Sustainability in Software Development Companies** | 2018 | This paper surveys software professionals to gauge awareness and application of sustainability, focusing on the environmental and technical dimensions. It reveals that while there is a desire to be sustainable, there is a gap between this and the actual implementation of sustainable practices in the workplace. | RQ1. RQ2 |
| S59 | **Towards a Method for Modelling Socio-technical Process Transformation in Digital Agriculture** | 2024 | This paper presents a preliminary method using Model-Driven Requirements Engineering (MoDRE) techniques to model the transformation of agricultural processes due to digitalization. The goal is to create understandable diagrams that help interdisciplinary teams analyze the impacts of new technologies. | RQ2 |
| S60 | **Requirements: The Key to Sustainability** | 2016 | This article argues that sustainability must become a central concern in software engineering, moving beyond purely technical and economic considerations. It proposes a paradigm shift driven by requirements engineering, where the long-term environmental, social, individual, economic, and technical impacts of software are explicitly considered from the project's inception. | RQ1, RQ2 |
| S61 | **Towards sustainable software systems: A software sustainability analysis**  **framework** | 2024 | The paper proposes a Software Sustainability Analysis Framework (SSAF) to help foresee and manage the sustainability impacts of software across multiple dimensions. It provides a list of sustainability categories for each dimension. | RQ2 |
| S62 | **Exploring Assessment Criteria for Sustainable Software Engineering**  **Processes** | 2024 | This paper outlines a framework for assessing the sustainability of software engineering processes, identifying 38 criteria across five categories. | RQ2 |
| S63 | **Sustainability Requirement Patterns** | 2013 | This paper proposes using "sustainability requirement patterns" (SRPs) to help developers integrate environmental sustainability into software. It identifies three initial patterns based on resource consumption | RQ1 |
| S64 | **Sustainability competencies and skills in software engineering: An industry perspective** | 2024 | This paper investigates the sustainability skills and competencies needed in the software industry, identifying high-level goals organizations want to achieve. It finds that a major difficulty is the lack of concrete, consistent metrics to measure sustainability, with the CO2 footprint being a noted example. | RQ1 |
| S65 | **Quantification of Social Sustainability in Software** | 2014 | This paper proposes a research plan to identify and quantify social sustainability in software, aiming to create a comprehensive set of metrics and a method for their use in requirements engineering. | RQ2 |
| S66 | **Towards sustainable software quality in use: a review of measures** | 2025 | This article reviews and identifies 100 software quality measures related to sustainability, finding a primary focus on economic aspects in existing literature and standards. It concludes that social and environmental dimensions are underrepresented and proposes extending the ISO/IEC 25022 Quality in Use model to be more comprehensive. | RQ1, RQ3 |
| S67 | **NFR4SUSTAIN: Catalog of Requirements for Software Sustainability** | 2025 | This paper introduces NFR4SUSTAIN, a catalog of non-functional requirements designed to help developers integrate sustainability into software projects. The catalog categorizes 16 main and 39 secondary requirements across economic, social, and technical dimensions. | RQ2 |
| S68 | **Requirements definition for the economic, environmental and social sustainability assessment of Product-Service Systems: State-of-the-art** | 2025 | This paper systematically reviews the literature on assessing Product-Service System (PSS) sustainability, revealing a fragmented landscape of methods that often neglect social aspects and system dynamics. It defines five key requirements for future assessments, advocating for a holistic, life-cycle-based approach that integrates all three TBL dimensions and accounts for stakeholder perspectives and uncertainties. | RQ1, RQ3 |
| S69 | **A Comparison of Software Quality Characteristics and Software Sustainability Characteristics** | 2019 | This paper compares software quality and software sustainability characteristics, concluding that while there is an overlap, their priorities differ. The study suggests that the ISO 25010 standard can be effectively utilized to cover the technical dimension of software sustainability. | RQ1, RQ3 |
| S70 | **Sustainability and Quality: icing on the cake** | 2013 | This paper defines sustainable software development by its efficiency in using resources like energy, CPU, and memory. It positions sustainability as a non-functional requirement and explores how it might be integrated into software quality models like ISO/IEC 25010. | RQ1 |
| S71 | **A survey of energy concerns for software engineering** | 2024 | This study lists out some energy-efficient software requirements. | RQ1 |
| S72 | **Sustainable Approaches and Good Practices in Green SoftwareEngineering** | 2012 | This research work proposes adding 'Environment Requirements' as a new type of non-functional requirement in the software development process. It also suggests defining and using metrics related to environmental feasibility and system resource usage to guide and test for sustainability. | RQ1 |
| S73 | **Green Metrics for energy-aware IT systems** | 2011 | This paper introduces a framework of "Green Metrics" designed to characterize the energy consumption and overall "greenness" of IT applications. These metrics are grouped into four categories: IT resource usage, lifecycle, environmental impact, and organizational factors. | RQ2 |
| S74 | **Safety, Security, Now Sustainability: The Nonfunctional Requirement for the 21st Century** | 2014 | This paper argues that sustainability must be treated as a first-class nonfunctional requirement in software engineering, similar to safety and security. It suggests defining specific requirements and constraints and using established frameworks like the ISO 14000 family and the Environmental Sustainability Index for measurement. | RQ1 |
| S75 | **A Systematic Review for Sustainable Software Development Practice and Paradigm** | 2024 | This research work defines software sustainability through technical longevity, architectural integrity, and the management of "sustainability debt." It provides an extensive list of code, architecture, and knowledge-level metrics to assess these aspects and improve long-term system maintainability. | RQ2 |
| S76 | **Sustainable Approaches and Good Practices in Green Software Engineering** | 2012 | This research work proposes integrating sustainability into the software development lifecycle by introducing new environmental requirements. It also suggests specific metrics to measure and evaluate the "greenness" of software. | RQ2 |
| S77 | **Toward a Greener Web: A Systematic Literature Review of Sustainable Practices in Web Development** | 2025 | This paper provides a literature review of sustainable practices in web development across the design, development, and deployment phases of the Software Development Life Cycle (SDLC). It focuses on strategies to reduce energy consumption and CO2 emissions, aligning with the UN's Sustainable Development Goals. | RQ1, RQ3 |
| S78 | **Green Measurements for Software Product Based on Sustainability Dimensions** | 2022 | This paper identifies and validates green measurements for software products by linking them to the three dimensions of sustainability: environmental, social, and economic. It reveals seven key green measurements through a literature review and an empirical study involving industry professionals in Malaysia. | RQ1, RQ2 |
| S79 | **Green Software Product: The Empirical Study on Social Factor and Measurements** | 2023 | This paper details an empirical study on the social factors and measurements for green software products. The research identifies and validates employee support and tool support as the two primary measurements of social sustainability. | RQ2 |
| S80 | **Sustainable Development, Sustainable Software, and Sustainable Software Engineering** | 2011 | This paper presents an integrated approach for sustainable software development by analyzing the entire software life cycle. It proposes a model that defines criteria and actions to minimize negative environmental, economic, and social impacts. | RQ1 |
| S81 | **Sustainable Design of IT Systems with Digital Twins – Principles, Application Areas and Advantages** | 2022 | This paper presents a new methodology for the sustainable design of long-lasting, software-intensive IT systems using digital twins. The approach focuses on managing the entire product lifecycle, from initial design with components that are not yet available to future maintenance and evolution, by leveraging technology prediction and persistent documentation. | RQ1 |
| S82 | **Towards Sustainable Software Criteria: Rescue Operation and Disaster Management System Model** | 2013 | This paper proposes a conceptual framework for a sustainable Rescue Operation and Disaster Management System (RODMS). It identifies key criteria for software sustainability to address issues like high ownership costs, short product lifecycles, and the inability of current systems to evolve with technological and policy changes. | RQ1, RQ3 |
| S83 | **Measuring Software Sustainability from a Process Centric Perspective** | 2012 | This research work outlines a process-centric approach to measuring software sustainability, moving beyond a narrow focus on environmental aspects to a broader view encompassing people, infrastructure, and processes. It proposes specific sustainability processes and suggests metrics for their evaluation. | RQ2 |
| S84 | **The Green Software Measurement Structure Based on Sustainability Perspective** | 2021 | This research work presents a structured approach to measuring green software from a sustainability perspective, breaking it down into economic, environmental, and social dimensions. It proposes a hierarchy of elements, measurements, sub-measurements, and specific metrics to assess a software product's "greenness." | RQ1, RQ2 |
| S85 | **Towards Green Software Process: A Review on Integration of Sustainability Dimensions and Waste Management** | 2019 | This paper reviews existing green software process models to analyze how they integrate sustainability dimensions (economic, social, environmental, technical, individual) and waste management. It identifies a lack of comprehensive integration in current models and proposes that future work should focus on incorporating all these aspects throughout the software development lifecycle | RQ1, RQ3 |
| S86 | **Green Software Process Based on Sustainability, Waste and Evaluation Theory Approach: The Conceptual Model** | 2022 | This paper presents a conceptual model for a green software process, named GSoftPro, which is based on sustainability, waste elimination, and evaluation theory. The model integrates sustainability dimensions and software waste elements into the development lifecycle to produce greener and more sustainable software. | RQ1 |
| S87 | **SustainScrum: integrating sustainability assessment in a tailored Scrum process for computing quantitative sustainability indicators** | 2025 | This paper introduces SustainScrum, a process for integrating sustainability assessments into agile software development to generate quantitative indicators for reporting. | RQ1, RQ3 |
| S88 | **Social Sustainability Approaches for Software Development: A Systematic Literature Review** | 2023 | This paper provides a systematic literature review on social sustainability in software development, aiming to identify tools and practices to integrate social aspects into the process. | RQ2 |
| S89 | **Exploring Social Sustainability Alignment in Software Development**  **Projects** | 2024 | This paper explores the alignment of social sustainability concerns between customers and students in software engineering projects, identifying several high-level goals that function as requirements. | RQ1, RQ2 |
| S90 | **Towards a Software Product Sustainability Model** | 2013 | This paper proposes adding a "sustainability" characteristic to the ISO/IEC 25010 software quality model. This new characteristic is defined by energy consumption, resource optimization, and long-term perdurability. | RQ1 |
| S91 | **Sustainability design in requirements engineering: State of practice** | 2016 | This paper explores practitioners' views on sustainability, revealing a general lack of formal requirements in their daily work. The focus is more on organizational behavior and high-level concepts rather than specific, measurable software metrics. | RQ1, RQ2 |
| S92 | **Exploring Assessment Criteria for Sustainable Software Engineering Processes** | 2024 | This paper presents a comprehensive framework of 38 criteria for assessing the sustainability of software engineering processes, developed through literature review and collaboration with an industry partner. These criteria are grouped into five categories, covering best practices, software operations, team culture, awareness, and governance to provide a holistic view of sustainability. | RQ1, RQ2, RQ3 |
| S93 | **Requirements engineering for sustainability: an awareness framework for designing software systems for a better tomorrow** | 2020 | This paper presents a framework to help stakeholders discuss the potential sustainability effects of software across social, individual, environmental, economic, and technical dimensions. | RQ2 |
| S94 | **What Concerns Game Developers? A Study on Game Development Processes, Sustainability and Metrics** | 2017 | This study reveals that while game developers engage in some sustainable practices like code reuse, their overall involvement in "green activities" is low. The paper suggests there is a general lack of a clear, common definition for sustainability within the game development industry. | RQ1, RQ3 |
| S95 | **Harnessing Digital Marketing for Sustainable Development: A Comprehensive Review** | 2024 | This paper explores how digital marketing can promote broad sustainability goals across economic, social, and environmental dimensions. | RQ1, RQ3 |
| S96 | **Evidencing Sustainability Design through Examples** | 2015 | The provided document details sustainability requirements and metrics through two main case studies: a car-sharing system (DriveNow) and a nursing service system (ONE). It also lists general "good practice" guidelines for sustainability in requirements elicitation. | RQ1, RQ3 |
| S97 | **Exploring Potential Factors in Green and Sustainable Software Product** | 2018 | This paper outlines the dimensions of sustainable software, focusing on conceptual factors across social, economic, and environmental categories. | RQ1 |
| S98 | **Do we really know what we are building? Raising awareness of potential Sustainability Effects of Software Systems in Requirements Engineering** | 2019 | This paper presents a question-based "Sustainability Awareness Framework" to help requirements engineers discuss the potential effects of software systems across five dimensions of sustainability. | RQ1 |
| S99 | **Tailoring Requirements Negotiation to Sustainability** | 2018 | This paper extends the WinWin Negotiation Model to help practitioners consider the impact of any requirement on sustainability. It provides a framework for discussing effects across different dimensions | RQ1 |
| S100 | **Exploring the Nexus of Sustainability and Project Success: A Proposed Framework for the Software Sector** | 2023 | This paper introduces a conceptual framework to examine the relationship between software project sustainability (SPS) and project success. It defines SPS through two lenses—product sustainability and process sustainability—and breaks each down into aspects related to the economic, environmental, and social pillars of the triple-bottom-line. | RQ1 |
| S101 | **Incorporating sustainability into software projects: a conceptual framework** | 2020 | This paper presents a conceptual framework for incorporating sustainability into software projects, viewing it from two perspectives: product sustainability and process sustainability. The framework is built on the triple-bottom-line (TBL) theory, categorizing relevant aspects into economic, environmental, and social dimensions. | RQ1, RQ3 |
| S102 | **Bridging the Silos of Digitalization and Sustainability by Twin Transition: A Multivocal Literature Review** | 2025 | The work  analyzes the sustainability ambitions and dimensions that are the focus of twin transition research. | RQ1, RQ3 |
| S103 | **User Personas Improve Social Sustainability by Encouraging Software Developers to Deprioritize Antisocial Features** | 2025 | This work emphasizes that socially sustainable software development involves embedding ethical principles and addressing societal well-being. | RQ1, RQ2 |
| S104 | **Connecting the Dots: IoT, sustainability, and SDGs** | 2025 | This article reviews how the Internet of Things (IoT) can support the United Nations' Sustainable Development Goals (SDGs). It focuses on mapping IoT applications to the 17 SDGs | RQ1 |
| S105 | **Enhancing Sustainable IoT Systems Through a Goal-Oriented Requirements Analysis Framework** | 2025 | This paper presents a goal-oriented requirements analysis framework (GORA) designed to embed sustainability into the development of Internet of Things (IoT) systems from the earliest stages. The framework's success in achieving sustainability is then assessed through an empirical evaluation using specific performance and resource-focused metrics. | RQ1, RQ3 |