**Supplementary material**

**S1**

**Search protocol**

First, we tested search term combinations in Google Scholar and added synonyms based on initial searches and on literature. We searched synonyms for measure from Thesaurus.

We searched for scientific articles in English from the databases Web of Science (WoS) and Scopus. We excluded irrelevant fields and other publication types than articles and reviews. Retrieval on second of February 2018 produced a dataset of 266 articles from WoS and 235 articles from Scopus.

We retrieved articles for following searches:

Scopus

( TITLE ( sustainability AND transformation ) OR TITLE ( transformation AND to AND sustainab\* ) OR TITLE ( societal AND transformation AND sustainability ) OR TITLE ( fundamental AND societal AND shift AND sustainability ) OR TITLE ( sustainability AND change ) AND TITLE-ABS-KEY ( measure\* OR assess\* OR evaluate\* OR monitor\* ) )

Articles: 340

Exclude:

Medicine (21)

Biochemistry, Genetics and Molecular Biology (5)

Nursing (3)

Health Professions (1)

Immunology and Microbiology (1)

* 312

Article, review, article in press

* 235

Web of Science Core Collection

TITLE: (sustainability transformation) OR TITLE: (transformation to sustainab\*) OR TITLE: (societal transformation sustainability) OR TITLE: (fundamental societal shift sustainability) OR TITLE: (sustainability change) AND TOPIC: (measure\* OR assess\* OR evaluate\* OR monitor\*)

Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC.

Articles: 400

Exclude:

Medicine general internal (13)

Geography physical (9)

Public environmental occupational health (8)

Engineering electrical electronic (5)

Health care sciences services (5)

Meteorology atmospheric sciences (4)

Primary health care (4)

Health policy services (3)

Hospitality leisure sport tourism (3)

Remote sensing (3)

Biotechnology applied microbiology (2)

Mineralogy (2)

Mineralogy (2)

Chemistry inorganic nuclear (1)

Dentistry oral surgery medicine (1)

Engineering chemical (1)

Imaging science photographic technology (1)

Metallurgy metallurgical engineering (1)

Nuclear science technology (1)

Nursing (1)

* 342

Article, review

* 266

**S2**

**Table S2. Reviewed articles.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Authors | Title | Year | Journal | Empirical/theoretical |
| Beling, AE; Vanhulst, J; Demaria, F; Rabi, V; Carballo, AE; Pelenc, J | Discursive Synergies for a 'Great Transformation' Towards Sustainability: Pragmatic Contributions to a Necessary Dialogue Between Human Development, Degrowth, and Buen Vivir  | 2018   | ECOLOGICAL ECONOMICS   | Theoretical |
| Weiland, S; Bleicher, A; Polzin, C; Rauschmayer, F; Rode, J | The nature of experiments for sustainability transformations: A search for common ground  | 2017 | JOURNAL OF CLEANER PRODUCTION   | Theoretical |
| Schlaile, MP; Urmetzer, S; Blok, V; Andersen, AD; Timmermans, J; Mueller, M; Fagerberg, J; Pyka, A | Innovation Systems for Transformations towards Sustainability? Taking the Normative Dimension Seriously  | 2017 | SUSTAINABILITY | Theoretical |
| Weiser, A; Lutz, LM; Lang, DJ; Kummerer, K | Acknowledging temporal diversity in sustainability transformations at the nexus of interconnected systems  | 2017 | JOURNAL OF CLEANER PRODUCTION   | Theoretical, includes exemplary case |
| Patterson, J; Schulz, K; Vervoort, J; van der Hel, S; Widerberg, O; Adler, C; Hurlbert, M; Anderton, K; Sethi, M; Barau, A | Exploring the governance and politics of transformations towards sustainability  | 2017 | ENVIRONMENTAL INNOVATION AND SOCIETAL TRANSITIONS   | Theoretical |
| Sarkki, S; Ficko, A; Grunewald, K; Kyriazopoulos, AP; Nijnik, M | How pragmatism in environmental science and policy can undermine sustainability transformations: the case of marginalized mountain areas under climate and land-use change  | 2017 | SUSTAINABILITY SCIENCE   | Empirical  |
| Pichler, M; Schaffartzik, A; Haberl, H; Gorg, C | Drivers of society-nature relations in the Anthropocene and their implications for sustainability transformations  | 2017 | CURRENT OPINION IN ENVIRONMENTAL SUSTAINABILITY   | Theoretical |
| Abson, DJ; Fischer, J; Leventon, J; Newig, J; Schomerus, T; Vilsmaier, U; von Wehrden, H; Abernethy, P; Ives, CD; Jager, NW; Lang, DJ | Leverage points for sustainability transformation  | 2017 | AMBIO | Theoretical |
| Olsson, P; Moore, ML; Westley, FR; McCarthy, DDP | The concept of the Anthropocene as a game-changer: a new context for social innovation and transformations to sustainability  | 2017 | ECOLOGY AND SOCIETY   | Theoretical |
| Barau, AS; Stringer, LC; Adamu, AU | Environmental ethics and future oriented transformation to sustainability in Sub-Saharan Africa  | 2016 | JOURNAL OF CLEANER PRODUCTION   | Empirical  |
| Wolfram, M; Frantzeskaki, N; Maschmeyer, S | Cities, systems and sustainability: status and perspectives of research on urban transformations  | 2016   | CURRENT OPINION IN ENVIRONMENTAL SUSTAINABILITY   | Theoretical |
| Krellenberg, K; Koch, F; Kabisch, S | Urban Sustainability Transformations in lights of resource efficiency and resilient city concepts  | 2016 | CURRENT OPINION IN ENVIRONMENTAL SUSTAINABILITY   | Theoretical |
| Martinez, JG; Boas, I; Lenhart, J; Mol, APJ | Revealing Curitiba's flawed sustainability: How discourse can prevent institutional change  | 2016 | HABITAT INTERNATIONAL   | Empirical  |
| Ernst, L; de Graaf-Van Dinther, RE; Peek, GJ; Loorbach, DA | Sustainable urban transformation and sustainability transitions; conceptual framework and case study  | 2016   | JOURNAL OF CLEANER PRODUCTION   | Empirical  |
| Daneri, DR; Trencher, G; Petersen, J | Students as change agents in a town-wide sustainability transformation: the Oberlin Project at Oberlin College  | 2015  | CURRENT OPINION IN ENVIRONMENTAL SUSTAINABILITY   | Empirical  |
| Pant, LP; Adhikari, B; Bhattarai, KK | Adaptive transition for transformations to sustainability in developing countries  | 2015 | CURRENT OPINION IN ENVIRONMENTAL SUSTAINABILITY   | Theoretical |
| Moore, J | Ecological Footprints and Lifestyle Archetypes: Exploring Dimensions of Consumption and the Transformation Needed to Achieve Urban Sustainability  | 2015 | SUSTAINABILITY | Empirical  |
| Olsson, P; Galaz, V; Boonstra, WJ | Sustainability transformations: a resilience perspective  | 2014 | ECOLOGY AND SOCIETY   | Theoretical |
| Pickett, STA; Boone, CG; McGrath, BP; Cadenasso, ML; Childers, DL; Ogden, LA; McHale, M; Grove, JM | Ecological science and transformation to the sustainable city  | 2013  | CITIES | Empirical  |
| Trencher, GP; Yarime, M; Kharrazi, A | Co-creating sustainability: cross-sector university collaborations for driving sustainable urban transformations  | 2013  | JOURNAL OF CLEANER PRODUCTION   | Empirical  |
| Higgins, P | From sustainable development to carbon control: urban transformation in Hong Kong and London  | 2013  | JOURNAL OF CLEANER PRODUCTION   | Empirical  |
| Chapin, FS; Mark, AF; Mitchell, RA; Dickinson, KJM | Design principles for social-ecological transformation toward sustainability: lessons from New Zealand sense of place  | 2012 | ECOSPHERE | Empirical  |
| Westley, F; Olsson, P; Folke, C; Homer-Dixon, T; Vredenburg, H; Loorbach, D; Thompson, J; Nilsson, M; Lambin, E; Sendzimir, J; Banerjee, B; Galaz, V; van der Leeuw, S | Tipping Toward Sustainability: Emerging Pathways of Transformation  | 2011 | AMBIO | Theoretical |
| Fischer, A; Peters, V; Vavra, J; Neebe, M; Megyesi, B | Energy use, climate change and folk psychology: Does sustainability have a chance? Results from a qualitative study in five European countries  | 2011 | GLOBAL ENVIRONMENTAL CHANGE-HUMAN AND POLICY DIMENSIONS   | Empirical  |
| Burns, TR | The Sustainability revolution: A Societal Paradigm Shift - Ethos, Innovation, Governance Transformation  | 2011 | SOCIOLOGISK FORSKNING   | Empirical |
| Haberl, H; Fischer-Kowalski, M; Krausmann, F; Martinez-Alier, J; Winiwarter, V | A Socio-metabolic Transition towards Sustainability? Challenges for Another Great Transformation  | 2011 | SUSTAINABLE DEVELOPMENT   | Empirical  |
| Li, MQ | Capitalism, Climate Change and the Transition to Sustainability: Alternative Scenarios for the US, China and the World  | 2009 | DEVELOPMENT AND CHANGE   | Empirical  |
| Princiotta, FT; Loughlin, DH | Global climate change: The quantifiable sustainability challenge | 2014 | JOURNAL OF THE AIR AND WASTE MANAGEMENT ASSOCIATION | Empirical  |
| Harich, J | Change resistance as the crux of the environmental sustainability problem | 2010 | SYSTEM DYNAMICS REVIEW | Empirical  |
| Ritz, C; Schurer, T | Sustainability in a time of global change the challenge for research | 2001 | MOUNTAIN RESEARCH AND DEVELOPMENT | Theoretical |