The Role of Citizens in Realizing AI for Sustainability on a local level

Jana Sophie Schemmer

Management, Society and Technology

University of Twente

Supervisor: Dr. M.R.R. Ossewaarde

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Abstract

The title of this Bachelor thesis is "The Role of Citizens in *Realizing* AI for Sustainability". To find out the role of citizens in the realization of AI on the multiple levels of policymaking a textual analysis of different policy documents will be conducted based on the research question: *"What is the role of citizens in the process of realizing AI solutions for sustainability on global, European, national and local level?".* This question will be divided into four sub-questions; "*What is the envisioned role of citizens in global-level AI for differences policy?"*, "*What is the envisioned role of citizens in policy on AI for sustainability on the European level?"*, *"What is the envisioned role of citizens in policy on AI for sustainability on the national level?"* and lastly, *"What is the envisioned role of citizens in policy on AI for sustainability on the local level?".* This study aims to fill the research gap on the envisioned role of citizens in AI for sustainability policies in the context of multi-level governance.

List of Abbreviations

AI	Artificial Intelligence
BMWSB	Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen
BMBF	Bundesministerium für Bildung und Forschung
UN	United Nations
EU	European Union
EC	European Commission

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1 Introduction

1.1 Background

Sustainability is an important challenge that needs to be tackled in the near future to slow down climate change before the tipping points are reached and the possibility to be prevent this to any further extent is expired. Climate change regulation is a matter of public policies and questions regarding social acceptance and freedom arise. Many scholars claim that a promising tool to tackle climate change related issues is Artificial Intelligence. AI holds a lot of potential for different fields of environmental sustainability, especially in regard to efficiency and predictability of natural disasters.

AI is a rapidly evolving field, which holds a lot of potential, positive and negative, for the future and it could provide solutions for example for efficiency. Thus, AI holds massive potential in regard to supporting sustainable development. AI is used in many different fields within sustainability, for example in energy management, pollution monitoring or water management. Even though it is expected to make serious changes in sustainability in the future, AI also poses new problems in the future and presents ethical and legal issues, which can cause mistrust among citizens. According to Vinuesa, Azizpour, Leite, *et al. "AI can enable the accomplishment of 134 targets across all the goals, but it may also inhibit 59 targets."* (Vinuesa, Azizpour, Leite, et al., 2020).

Through the steadily increasing importance of these issues, it has reached attention from global policymakers shaping the political agendas throughout different levels of government. Likewise, different studies have shown, that the role of citizens in AI and sustainability policy is under-researched (Soma et al.,2016). Policymakers already take AI for sustainability into account when making climate politics for reaching their various climate political goals. AI policies have been developed all over the world, on the international level, on the European level, on the national level, and also on the local level. According to Mattijssen et al., the collaboration between government authorities and citizens can potentially benefit both parties. Governments have the power to direct citizen engagement by funding and regulating it (Mattijssen et al., 2017). Thus, to successfully collaborate with citizens in the field of AI for sustainability, it is important to know how citizens are and can be involved in the policy-making process. According to the OECD, citizen participation *"leads to better policy results that take into account and use citizens' experience and knowledge to address citizens' most pressing needs"* (OECD, 2022). Thus, a policy's effectiveness is highly influenced by citizen participation. The implementation often takes place in the context of smart cities. Citizens however are often underrepresented in that discussion. Hence the question of the role of citizens in the implementation process of AI solutions for sustainability, in this case, can be posed to understand how citizens can benefit from the implementation of AI solutions for sustainability and vice versa.

Moreover, citizens may have huge concerns about AI for sustainability. According to the Bertelsmann Stiftung, it is essential to consider what people know and think about AI, to handle its risks

and potential with responsibility. Trust in technology is a big factor in the relationship between citizens and new technologies like AI. It is the base of the willingness of citizens to utilize AI technologies and with that their permission of change in foresight to technological advancement in praxis (Liu et al., 2022). According to a representative study by the Bertelsmann Stiftung, more than half of the population in Germany connotates the terms 'algorithm' and 'artificial intelligence' quite positively with 'preciseness', 'effectiveness' or 'advancement' (Bertelsmann Stiftung, 2022). However, almost as many people, around 50 % of the respondents connotate especially the term 'artificial intelligence' more negatively with words like 'threat' and 'frightening'. Thus, it is of high importance for policymakers to take citizens' opinions, concerns, viewpoints etc. into account when making decisions on AI for sustainability. This study will add to the existing body of knowledge by contributing to the research on the role of citizens in realizing AI solutions for sustainability.

1.2 Research question

The descriptive research question *"What is the envisioned role of citizens in the process of realizing AI solutions for sustainability as portrayed in policy discourses of the UN, the EU, German federal and German smart cities?"* aims to clarify the citizens' role in the process of designing policy solutions for AI for sustainability and moreover, it intends to give insights on whether citizens play a role in smart cities' policy implementation process, and if so, to what extent. The corresponding three sub-questions are*: "What is the envisioned role of citizens in global-level AI for sustainability policy?", "What is the envisioned role of citizens in policy on AI for sustainability on the national level?"* and lastly *"What is the envisioned role of citizen in the local level policy discourses, particularly in the context of smart cities?"* By posing these questions, the roles of citizen in different levels of policy discourses shall be analyzed and critically reflected in order to fully understand the scope of the role of citizen, which is vital for efficient policy development.

A thorough analysis of the expectations of multilevel policy making towards citizen is needed in order to grasp the accountability and possibilities citizens have within this highly discussed discourse on AI and sustainability, thus increasing transparency of policymakers and governments towards citizen. By clarifying and openly communication or even promoting the position citizens pursue in these discourses, the efficiency of reaching a set policy target together with citizen can be increased.

Furthermore, the research question targets multiple levels of policy making for the reason that all these levels of policy making are intermingled. Each of these policy levels is operating in a certain manner whilst being interlinked with each other. On the global level, policy making rather focusses on the broader context, since it is responsible for providing a central framework, which have to be adaptable to diverse realities of nations for example. The nations then adopt these global guidelines and

implement them in a manner that fits the national circumstances and adapt to an extent to the individual countries needs and possibilities. Lastly, the local level is then the implementing instance, which is closest to the citizen and also has its own particular context and prerequisites. Thus, to identify the origin of citizen involvement and the broader context the policy lays within, it is necessary to have an overarching research question covering the three different levels of policymaking.

1.3 Research Approach

In order to find an answer to the research questions above and get the anticipated insights mentioned in the section above, the following research approach will be used. The key mode of methodology will be a qualitative content analysis of documents published by the local, national, European, and global governmental instances. The analysis of these selected documents regarding the multilevel government's AI for sustainability regulations and strategy will be conducted specifically to find out how each of those present the role of citizen in this process. To discover these understandings, the analysis will search for the way citizens are depicted in the policy discourses, in the way language is used in the policy, how much attention is paid by policymakers to citizens, and what the government's expectations towards citizen are, implicitly and explicitly, as well as what tools the governments provide to citizens to enable or enhance civic engagement.

Along that, the sub questions are aiming to find out how citizen are portrayed on the national level, the European level and on the global level, because all four levels of policy are interrelated. To get the desired insights of the main research question, each individual policy making level will be analyzed within the analysis conducted for the sub questions. The analysis for the sub questions will be parallel to the analysis of the main research question, however, to fully grasp the complexity of multi-level policymaking, the individual level policies realms are systematically analyzed first within the sub-questions, to then contextualize to get a comprehensive understanding of the different levels of policy discourses on AI for sustainability. This will be done to categorize disparities and patterns, which will allow for a nuanced understanding of the role of citizens in policy on AI for sustainability discourses.

The research will present a complete and nuanced understanding of citizen participation in AI for sustainability by integrating results from local, national, European, and global levels. This multi-level approach is crucial for understanding how these policies adapt to numerous circumstances and the impact of these alterations for public participation. Finally, this research will add to our understanding of how AI for sustainability policies may be both locally relevant and internationally successful, ensuring that citizen's views and contributions to policymaking and implementation are recognized and included at all levels of government. This method recognizes the issue's complexity and the necessity for a multi-level examination to fully answer the research issues.

2 Theory

To analyze the role that citizens play in policymaking in the context of AI for sustainability it is necessary to build a theoretical framework. In the following chapter, this will be discussed.

2.1 Aim of the chapter

In this chapter, the individual concepts relevant to this research will be elaborated as well as to be put into context with each other. It will build the theoretical base for the qualitative content analysis that strives to answer the research question of this research. This section aims to provide a theoretical framework, which conceptualizes the role of citizens and policymaking in the context of AI for sustainability and ultimately to give a theoretical answer to the research question. The intent of this theory is to delve into the impact of citizens in the policymaking and implementation process, as well as the citizens' potential political influence in this regard. Given the research question "*What is the envisioned role of citizens in the process of realizing AI solutions for sustainability as portrayed in policy discourses of the UN, the EU, German federal and German smart cities?"*, the key focus is the role of citizen, and secondly the multi-levelness of the topic and discourse. Additionally, the relationship of the diverse levels of policymaking and implementation will be explored, as well as the concepts of AI and Sustainability to understand the context of the policies that will be subject to the analysis. Therefore, two primary areas of theory contribute to the desired theoretical framework, namely the theories on citizen and policy. To pursue this goal, the following structure of theory will be presented in the next sections. First, the history and evolvement of citizenship will be explored in order to have a comprehensive understanding of citizenship. Next, the meaning of citizenship in the context of AI for sustainability will be elaborated by exploring theory regarding distinct roles of citizen, citizen participation, public participation, smart citizen will be discussed. The politics of scale will be elaborated to grasp the correlation between the different policymaking levels, which is of utmost importance for the sub-questions.

2.2 Discussions on citizenship

Citizenship is a concept, that has progressed throughout the time, as economies, societies, borders, and politics changed throughout different time periods in history. Those changes are always reflected in the relationship between governments and individuals.

The first theory approach to citizenship dates back to ancient Greece, where Aristotle inspired the first concept of citizenship, the Athenian citizenship, which was of exclusive nature and included rights to participate in a democratic process, but also entailed civic duties. Then, in ancient Rome, the Greek idea of citizenship was revisited and the right to citizenship became more inclusive as the Romans gave a citizenship status also to men from conquered territories. This form of citizenship also came with rights

and duties; however, the main element is the equality of legal status (p.32). During the Renaissance, the need for division of power was a substantial cornerstone of the development of citizenship, according to Machiavelli (p.38). Later on, during the formation of the US constitution, this assumption was adopted from a realist approach towards citizenship. The main evolvement thereby lays is the swift of citizens' motivation to participate, towards a self-interested reasoning to push your own interests in the collective decision-making process. Citizenship became more of a matter of individual rights and in modern times a matter of equality between different interest groups. Additionally, such constitutions serve as a formal contract between the state and its citizens. Within this contract a dual notion of citizens emerged, the 'public' political citizen, who has an acting role, and the private 'legal' citizen, who has a passive role, receiving natural rights (p.43). Two political ideas have emerged from this, the republican and the liberal notions. Republican describes liberty as a "product of laws" (p.43), while liberalism describes law as "a necessary evil" (p.43), meaning that liberty of individuals is natural and shall be protected. Then, in the 18th, 19th, 20th century, the notion of modern democratic citizenship was created by Marshall and Rokkan. According to them citizenship is "the product of the interrelated processes of state-building, the emergence of commercial and industrial society, and the construction of a national consciousness, with all three driven forward in various ways by class struggle and war." (p. 46). Marshall further defines three periods of citizenship evolution during this time period (Bellamy, 2008).

The main message of this history on citizenship is that the notion of citizenship has always been evolving. Since the beginning of the history of citizenship, it was and still is a steady progress of adapting the means of citizenship to current developments within the society and political discourse.

2.3 Citizenship in the context of AI for sustainability

Citizenship is a product of current economic, social, political developments, it is contextual. Thus, the next step is to elaborate on the influence of AI and Sustainability developments on citizenship and what the current notion of citizenship entails. In the context of AI for sustainability citizenship typically is understood as smart citizenship, a concept referring to the individual level of citizens. Furthermore, a smart citizen is a person, that actively uses modern technologies and data to improve the quality of life of themselves and others. They gather and share data and use technology as a monitor of decision-making. Smart citizenship also connects to digital literacy, which is "*the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies"* (UNESCO, 2018). A smart citizen has these abilities. Jisc categorizes these abilities of digital literacy into six elements: "ICT proficiency", "Information, data and media literacies", "Digital creation, problem-solving and innovation", "Digital communication, collaboration and participation", "Digital learning and development" and "Digital identity and wellbeing" (Jisc, 2016). Moreover, technological advancements, have the potential to enable citizens to be experts, since *"Smarter governance diffuses the tension between expertise and citizenship by taking seriously the view*

that all citizens possess expertise." (Noveck, 2015). Due to the possibilities that smart technologies offer; citizen no longer are only recipients of information.

Next, neoliberal citizenship also plays a role in the context of smart cities. According to Anastasiu, smart cities and technological innovation, thereunder AI for sustainability, occur predominately in private domains. The private sector dominance occurs because of the dominance of private companies and tech giants influence and predominant position, when it comes to developing new, innovative technologies including the sector of AI for sustainability. However, through neoliberalism, market-driven solutions and competition are the leading factors to more efficiency and fast technological development. Neoliberalism is a predominant ideology in the contemporary society and has contributed to the continuous privatization of citizenship (Susen, 2010). Moreover, citizenship in a neoliberal sense is characterized by citizens being autonomously responsible for their well-being, and through the market-driven economy, citizens are acting primarily as consumers of goods.

In addition to that, Irina Anastasiu, distinguishes three more approaches to categorize citizenship in her PhD thesis; the civic republican approach, the libertarian right-based approach, and the communitarian approach. The civic republican approach can be characterized through the perception of "*political participation as a civic duty*" (Anastasiu, 2020), and the anticipation, that technical innovation in smart cities goes hand in hand with the concept that citizens are not merely passive users of expertise, but active participants in government. This approach views citizen participation as critical to successful government (Hanasz, 2006). In the context of AI for sustainability, AI might even have capabilities to serve as an enabler for citizen engagement. The aforementioned approach encourages citizen to have a more active and inclusive role in creating the future of their towns (Anastasiu, 2020), The libertarian rights-based approach focusses on technological improvements and smart cities. These may be viewed as opportunities to express personal freedoms and rights by individuals with a libertarian rights-based orientation. Citizens who take this perspective may be concerned about government and business institutions invading their private realms in the cause of technology advancement. They may argue for robust data privacy safeguards and limited government engagement in the context of AI for sustainability. This approach places a premium on individual autonomy and may oppose any sort of monitoring or control that violates personal liberty. Lastly, the Communitarian approach is distinguishable by citizens highlighting the equilibrium between individual rights and group well-being (Anastasiu, 2020). Individuals that take this perspective should use technical breakthroughs in smart cities to benefit the larger society. Citizens may advocate for legislation that support ethical and responsible use of technology to address environmental concerns in the context of AI for sustainability. They value the balance between individual liberties and group efforts to attain long-term goals. This strategy highlights the importance of ensuring that technology supports the public good and community values (Etzioni,2024).

The smart citizen is a part of democracy, in the context of AI for sustainability, a smart democracy, the so-called “do-ocracy”. In this form of government, the smart citizen plays a key role. A do-ocracy is a system in which decisions are made by those who are actively involved, in this case, it is referring to smart citizens, in a project or campaign as opposed to a centralized authority. People or groups take on tasks and responsibilities in accordance with their skills and interests rather than waiting for someone to assign them assignments or make choices on their behalf. The consequence is the development of a decentralized structure where leadership is based on the contributions and abilities of individuals and groups and develops top-down. Do-oracy is widely used in collaborative projects where individuals work together to achieve a common goal, such as the creation of open-source software. In these efforts, individuals or groups assume tasks and duties in accordance with their expertise and interests, and decisions are made based on merit and contributions (Blijleven, 2016).

2.4 Conclusion

The urgence of climate change action and the positive potential of AI to help tackling this issue are what makes this field of policy this interesting. Next to the possibilities that AI technologies for sustainability offer, the uncertainty that the rapid advancements of AI create for citizens and rising fear and dystopian visions of technology is what particularly draws attention to the need for regulation of AI. Thus, it is incredibly important to involve and consider the role of citizen in this discourse in order to prevent distrust among citizens in the government and its decision-making. Moreover, this discussion concerns the whole world, and thus is very interconnected and requires collective action. This entails that the different policy levels are intermingled, and especially local policy is induced by other policies, which allocates far importance to investigating in these in addition to this research.

3 Methods

3.1 Introduction

The following chapter is dedicated to present the chosen methodology. In order to find out the role of citizen in policy on AI for sustainability in smart cities a suitable methodological approach is key.

3.2 Research design

There are four interrelated discussions about AI and sustainability in policy. First, there is the discussion on the international level policymaking. This relates to the first sub-question: "*What is the envisioned role of citizens in global-level AI for sustainability policy*?". In order to answer this question, policies from the UN will be analyzed for content in a qualitative manner. Secondly, the supranational European level will be analyzed to gain the desired insights on the second sub-question: *"What is the envisioned role of citizens in European-level policy on AI for sustainability?".* Thirdly, the discourse is held on the national level too. In this research the focus is on the existing discourse in Germany. The aim of analyzing this discussion mainly is to answer sub-question three: *"What is the envisioned role of citizens in policy on AI for sustainability on the national level?".* Consequently, governmental documents and policies of the German state will be analyzed following a qualitative content analysis. Lastly, the discussion also takes place in the local level, more specifically mostly in the context of smart cities. the last sub-question: "*What is the envisioned role of citizens in local-level policy on AI for sustainability?"* The main research question *"What is the envisioned role of citizens in the process of realizing AI solutions for sustainability as portrayed in policy discourses of the UN, the EU, German national and German smart cities?"* compares the findings of the above-mentioned analyses to understand variations of policy and its advantages and disadvantages to then identify certain strengths in policies and reflecting on potentially adopting these to other levels. To analyze the content of this, policy documents and governmental documents published by and focusing on smart cities, the German government, European and global institutions will be examined.

The UN was the chosen subject of analysis for the global level policy because on the global level the United Nations are a key player and important stakeholder. As an intergovernmental organization operating between 193 states and being a fully recognized subject of international law, the UN are an interesting object of analysis looking for multilateral policy making. The European Union has 27 member states and represents the European perspective. Analyzing only EU documents would have been a too Eurocentric point of view for such a globally relevant topic, such as sustainability and the rise of technology, which have a massive impact on all countries. Regardless, the EU is a highly relevant actor worth considering in this research due to its supranational nature, pursuing authority in certain policy areas over its member states. A key understanding in this regard is, that the EU is strongly influencing the nations and the cities' policymaking, thus considering these overarching policy frameworks allows contextualizing further analysis outcomes of national and local level policy.

Germany was chosen to be the subject of the analysis for the national level because Germany is one of the most influential members of the EU and adjust to EU frameworks and guidelines when making policies. Germany is one of the most powerful EU member states with a population of approximately 82 million and the third largest economy, measured by GDP, in the world and largest within Europe (KPMG, 2024). Moreover, Germany was one of the first European countries to have published a national strategy on artificial intelligence and since then, this strategy has been altered and updated (European Commission, 2021). Moreover, Germany has distinguished itself as an innovator in both the fields of technological advancement, as well as in sustainable development. The local level context thus also localizes in Germany. The particular focus on smart cities were chosen as the case for this research because of their advanced nature of implemented advanced technology, such as AI for sustainability. It is the most likely to find relevant insights in smart cities, due to their distinct focus on implementing smart technology within their city's strategy.

In order to gain sufficient insights into the AI for Sustainability matter, both policy areas sustainability policy, as well as AI policy will be object of analysis. Then, in these area specific policies, relevant passages relating to Sustainability and AI are filtered and examined for the perception of citizen.

3.3 Method of data collection:

For my study data from EU and UN, the German Government and German Smart cities' webpages will be used. By using this data, the aim is to find policy documents and publications that are relevant to my research. That data should represent the perception of policy makers on the role of citizen in the process of implementing AI for sustainability on a local level. It should also refer to AI and Sustainability.

For the global level the focus will be on UN policy, for example, the UN *AI for Good* and the *Paris Agreement* program. For the European level documents from the European Union will be used, for example the EU's *Green Deal* or the *Whitepaper on Artificial Intelligence* publications. The division between UN and EU is made, because of the international perspective vs the Eurocentric perspective of the EU. On the national level German policy will be analyzed, for example the *Artificial Intelligence made in Germany paper.* On the local level smart cities' policy documents and press releases will be object of analysis. Therefore, the first step is to identify German smart cities which will be done according to the list of smart cities from the Bundesministerium für Wohnen, Stadtentwicklung und Bauwesen (BMWSB). Moreover, the policy documents will be filtered for relevance to the topic. Hence chapters that do not relate to AI or sustainability policy will be excluded from the analysis. A key word search on online databases will help finding those required policy documents. Therefore, keywords like

"AI", "sustainability", "citizen participation", "smart city", "co-creation", "smart mentality", "green technology", "urban civic participation", "co-implementation" etc. will be used.

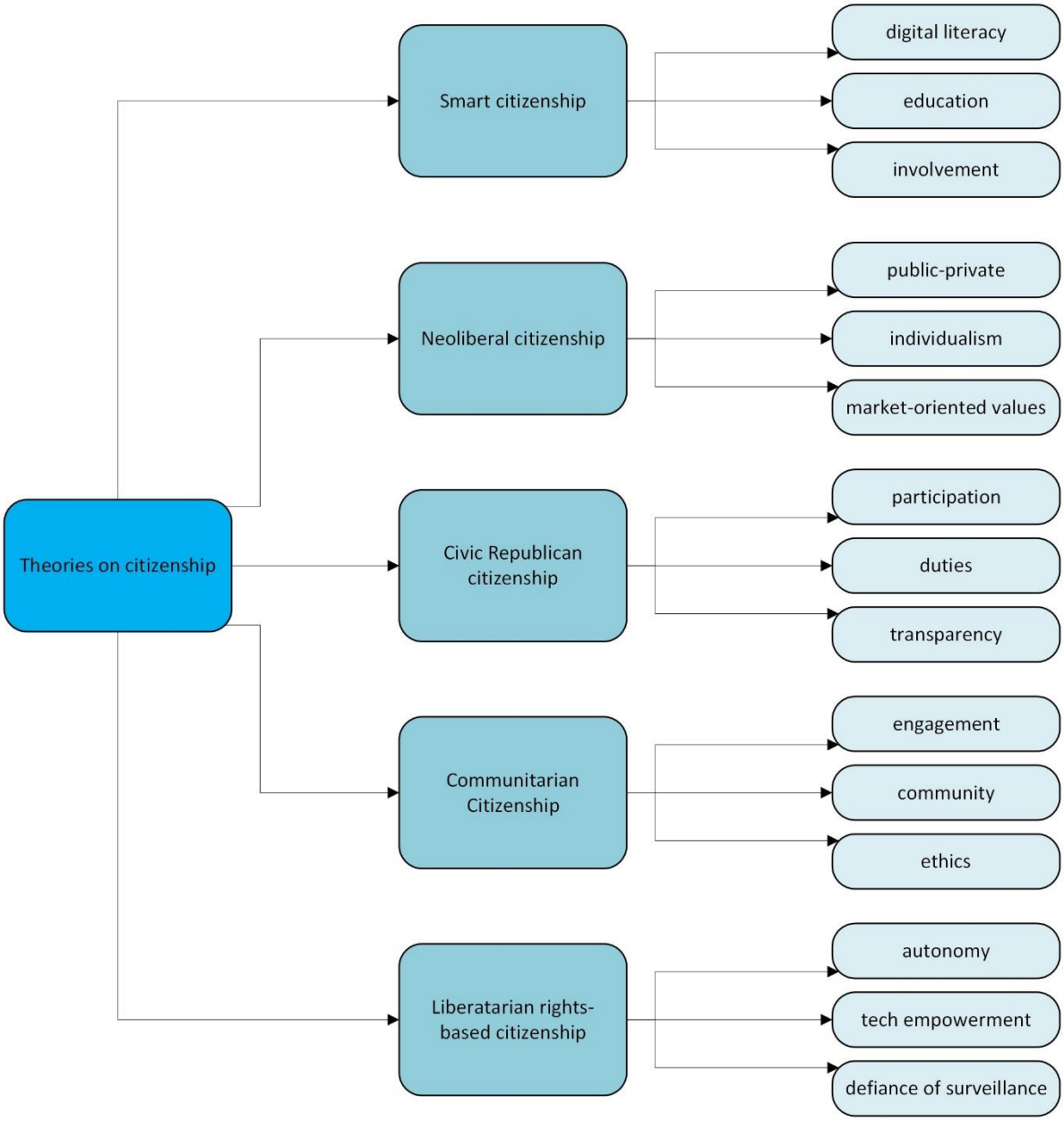
3.4 Method of data analysis

For this research I will use Qualitative Data Analysis. To elaborate on this method, first of all, content analysis is seeking for the analysis of material, derived from some form of communication. A definition of the term, however, must deal with major difficulty: "content analysis is by no means only concerned with the analysis of the content of communication." (Mayring, 2010). He further elaborates, that the advantages of quantitative analysis should be kept and portrayed onto qualitative evaluation of the data, which holds the potential to embed the data in its context and do empirical research of also larger texts. Qualitative Content Analysis is often used in social science research that allows researchers to analyse qualitative data through the identification of patterns, meanings, themes etc. in the data. It includes a systematic approach to identifying several types of data. The aim thereby is to identify key messages and ideas from the data. One of the leading scholars in this field, Saldaña, published the book "The Coding Manual for Qualitative Researchers" in 2016. In his book, he emphasizes the importance of coding in qualitative research. Coding is a research tool, which can aid scholars conducting qualitative research performing an analysis of textual data. Therefore, the data is compared conceptualized, categorized, and broken down. Furthermore, Saldaña points out the importance of rigour and reliability in coding. Consequently, he suggests using procedures like memoing and constant comparison to achieve a transparent and systematic coding process, which is embedded in data (Saldaña, 2016).

Under consideration of the aim of the research question and the chosen research approach, the carefully selected policy documents will be coded into categories, referring to the role of citizen in policy, based on theories on citizenship, as presented in Figure 1.

Figure 1

Coding scheme



3.5 Conclusion

Overall, this methodology aims to cover all important aspects needed for a thorough analysis of policy documents by investigating in four different policy levels to get a comprehensive approach on the complex governance structure behind the AI for sustainability policy discourse. First each level, between local and global, will be analysed as a separate entity, then the insights gained there, shall contribute to a complete picture of the relevant perceptions of citizenship throughout the various policy domains. In the end there might be a common theme, or varying patterns revealed by comparing the outputs from all four levels on a more holistic ground. To perform this desired analysis, a qualitative content analysis of open-access policy documents, retrieved from the institutions' websites will be

executed. Those policy documents are carefully selected by thematic relevance to the topic of AI for sustainability. After that, the coding scheme (*Figure 1*), will be applied to the documents to reveal patterns. The content analysis will be used to analyse wording and phrasing within the documents, assigning a meaning to the passages to reveal the perception of citizenship within the policy. These insights will allow for a better understanding of citizenship in the policy discourse on AI for sustainability, which can help future research and policymaking to have a more contextual understanding of citizenship for AI for sustainability.

4 Analysis

4.1 Introduction of Analysis

In the following section, the analysis will be presented. The aim of this analysis is to explore policy papers from various levels and distinct the way citizens are represented there. Therefore, policies will be analysed regarding their content, the portrayal of citizens and the extent of consideration of citizens. In the following the insights found in global level policy will be presented first, then the insights of national level policy from Germany will be elaborated and ultimately, the visions from local level policy from smart cities will be elucidated. Finally, a conclusion of these insights will be drawn in the last paragraph of this chapter.

4.2 Global level policy -United Nations

Looking for the UN's perception of the role of citizen in policy on AI for Sustainability, the UN seems to have an ambivalent perception of the extent to which AI is beneficial for sustainable development and for citizens. According to an article published by the UN Department of Economic and Social Affairs, in which Massachusetts Institute of Technology Professor Daren Acemoglu was interviewed, the question of whether AI was a rather a blessing or a curse for the development of Sustainability was posed. MIT Professor Acemoglu emphasized the critical importance of decision-making in order to steer the direction of future developments of AI. He claims, that with the intention of making socially beneficial decisions, a multitude of stakeholders must be included into the discussion of what expectations there are of AI's capabilities and risks. Furthermore, he stresses that AI should be proworker and pro citizen. That entails, that AI should be enhancing working processes and worker's expertise instead of substituting them. To achieve pro-worker AI, the civil society and workers have to voice their opinion and concerns, he added, otherwise AI will develop towards automation, which favors elites, not the civil society. (UN, 2023) Additionally, according to Acemoglu, AI tools might be able to enhance democratic participation processes, however, he emphasized that there must be an immense change in the mode of steering AI usage and development to get positive effects from AI. Looking more specifically at the effects of AI on sustainable development, Acemoglu has a more pessimistic view on AI's impact. He states: "[…] when it comes to central issues of sustainable development, such as […]

fighting climate change, […] the most important decisions are human decisions. “AI could be a small help, but it would be misleading and counterproductive to think that technologies can by themselves solve these human problems.” (UN, 2023). Likewise, he puts emphasis on the ethical issues that arise with AI, such as the disempowerment of people caused by AI, but most drastically unethical he finds the monopoly AI gains on data and information, which could cause misuse and manipulation of politics and economy to AI’s favor. This would contradict the aforementioned need for proworker and pro-citizen AI. Moreover, the main patterns that could be found among the wide variety of UN policy documents when looking for the perception of citizenship in AI for sustainability policy are involvement of citizen, risks of AI and the chances of AI. The way citizens are framed within this policy discourse, leads to the assumption that multiple theories of citizenship can be linked to the perception of policymakers of the UN.

Beginning with the view on citizen involvement in policy, the AI Advisory Body points out that “AI must be governed in the public interest” (p.15, AI Advisory Body), as one of their guiding principles. This entails the idea that the citizen’s or the public interest comes first before the private sector, regulated by binding norms. Citizens in this aspect are rather viewed as the users of AI, impacted by risks caused by the private sector companies that are in control of these technologies. This creates a picture of power imbalance between citizens as users and tech firms as power monopoly. (p.15, AI Advisory Body) Furthermore, governing in the public interest is described as investments in public infrastructure, public technology, and the capacity of public officials (p.15, AI Advisory Body). Again, this frames citizen as users, or consumers of AI, as a target of public policy, that needs user rights and protection and better public service.

However, not only user rights play a role in the governance of AI (for sustainability). The UN seeks to embed the governance of AI in the UN Charter, International Human Rights Law, and the SDGs (p.17). By embedding the AI policy in the rule of law and human rights, the citizen shall be protected against risks of AI by law. Risk is a reoccurring pattern along the UN policies on AI for sustainability and the list of risks is long. The main factors of where risks in AI occur, can be summarized as ethical risk, societal and social risk, and systemic risk. Systemic risks consist of technological errors of AI, which can cause *“risks, such as algorithmic bias, transfer context bias, interpretation bias and representation and allocation harms*” (p. 10, AI advisory body). These can influence the fields of risks through the distrust in technology, as well as through the blind trust of technology and missing digital literacy. Ethical risks include bias, manipulation, deception, nudging, sentencing, which impact human dignity, value, and agency (p.10, AI advisory body), less trust in democracy and privacy issues (p.26, UN Global Sustainability report). Societal risks include discrimination of certain groups and minorities, including not only gender-based discrimination, but also children or elderly, as well as people with disabilities are endangered to be affected by discrimination caused by AI. Another factor involved in this conflict is wealth (p.26, UN Sustainable Development Report). People affected by poverty or from

lower-income households cannot afford to own the most modern technologies and on the other side, the richest are profiting of such technologies the most. It widens the gap in the digital divide. If technology is inaccessible to certain groups of people or citizen, that can cause social inequality and equity, the digital divide, social disintegration (p. 24, Global Sustainable Development report), which also affects the functioning of a community and social cohesion. Even cultural diversity and human relationships are at a risk due to AI (p.10, AI advisory body). Thus, the goal of steering AI in the favour of the public good, is to "leave no one behind". Citizens are framed to have to be protected, as impacted by their surroundings, which includes the impact of newest technological developments such as AI. Their lives are affected by the rapid pace of developments, in which they are mostly involved in as a user and consumer. Which partially overlaps with the neoliberal perspective on citizenship, however only in the aspect, that the citizens are seen like a user, or as someone affected by a preexisting system, in which they do not actively participate.

On the other side, citizens are seen as a driving force behind steering AI for the good. The UN AI Advisory Body claims that "*Civil society, [...], would play key roles in building evidence for policy, assessing impact, and holding key actors to account during implementation*." (p.18, AI advisory body). The UN stresses the common good, claiming that citizens are crucial to the success of their policy implementation, framing them as "the driving force". This aligns with the theory of civic republicanism, which perceives citizen participation as critical to successful governance. Moreover, the UN Sustainable Development Report claims, that if a significant amount of people adopts one technology, in combination with collective action, it could lead to a societal change or in the case of AI for sustainability, that it reaches most of the population (p.46, UN). This means, that citizen hold an enormous power, when they act collectively. Their engagement and their behaviour and attitude towards technology can make a big impact on the success of the implementation of AI for sustainability, which again highlights the key attributes related to civic republicanism through the emphasis on active involvement and engagement of citizen in AI for Sustainability governance. As Acemoglu highlights, that the civil society shall be included into AI discussions, the importance of citizen's expressing their point of view in such discussions. Citizens being actively involved in discussions and decision-making processes leads to the assumption, that participatory citizenship is present in UN policy. Additionally, the strategy underscores the role of citizens and civil society in holding key actors accountable and promoting transparency and justice in AI development and implementation.

Their active participation and engagement can promote the general acceptance of AI technologies and guarantee that they are applied to sustainable development. Citizens may augment artificial intelligence's efficacy in tackling global issues such as climate change by engaging in data gathering and reporting activities. By working together, they can increase AI's advantages and make sure it's used fairly and morally. In addition, individuals could hold technology developers and legislators responsible, guaranteeing that AI systems be developed and applied in a manner that serves

the general welfare. To reduce the likelihood of biases, privacy breaches, and the escalation of inequality, this accountability is essential. Citizens may help develop regulations that encourage transparency, justice, and inclusion by being informed and actively participating in conversations regarding AI governance, which relates to the notion of libertarian rights-based citizenship.

4.3 European level policy – European Union

Next, in this section the EU's policies will be examined. To begin with, a very current topic of European Union's discourses is on how to regulate AI. The EU aims for steering AI into a human-centric, focussed on the public good, innovation-empowering AI governance for all. Throughout the EU documents, one of the reoccurring patterns is citizen empowerment through education. A strong emphasis is laid on education and skills and skill development on citizen, that vital to the success of those ambitions is the active involvement of its citizens. The European Union describes their citizens as highly skilled and as one of their strengths (p.1, Digital Compass). Hence, citizens are portrayed as one of the main contributors to achieving the goal of European excellence on the AI (for Sustainability) market. However, skilled citizens are dependent on education and tools for achieving those skills. Thus, there lays a focus on citizen education within the EU. The way citizens are framed in the EU documents, including descriptions about citizens' digital skills and the strong thematic emphasis on education, refers to notion of smart citizenship. The focus on education to enhance digital literacy among citizen is crucial to smart citizenship, as claimed in following statement: *"Governments, industry leaders, educational institutions and unions face a responsibility to bring the citizens into the new digital era ensuring they have the right skills to fill the future jobs.*" (p.33, High level expert group on AI). Moreover, AI is described as an enabling tool for gaining new skills, suitable for everyone. "*It could increase both the learning speed and the quality of education [...]*." (p.33, High level expert group on AI). The value of education cannot be emphasized enough. Phrases like "*to bring the citizens into the new digital era*" and *"ensuring they have the right skills*" (p.33, High level expert group on AI) suggest, that it is a priority educate citizen with lifelong learning and continuous adaptation to enable them to adjust to the rapid speed of development of AI for Sustainability. This is meant to happen in all levels of education to raise awareness about AI for sustainability, and likewise equip the citizens with skills that allow them to adjust to the rapidly developing digital landscape. The emphasis on education among citizen and specifically digital literacy clearly indicates the presence of the notion of smart citizenship, within the EU policies. Additionally, the white plan on Artificial Intelligence suggests, that citizen shall be able to take informed decisions (p.7).

Another theory can be found in the following statement: *"AI offers important efficiency and productivity gains that can strengthen the competitiveness of European industry and improve the wellbeing of citizens [...]."* (p.26, White Paper on Artificial Intelligence). The emphasis on market-

related gains in the same run as improved well-being on citizenship gives an interesting perspective on what characterizes and contributes to citizen's well-being. This claim can also be found in the report of the High-level Expert Group on AI, which claims, that "individual flourishing" and "collective well-being" can be enhanced through the means of trustworthy AI, because it fosters prosperity. This notion is typical for a neoliberalist perception on citizenship. Another quote indicating the presence of a neoliberal perception of citizenship is the following: "*Authorities can encourage their citizens to adopt sustainable lifestyles and consumption patterns by integrating intelligent city planning [...].*" (p.31, Connecting Smart and Sustainable Growth). Here, citizens are clearly framed as a consumer, which, again, relates to the market-oriented values of neoliberalism and furthermore government authorities are claimed to be playing a significant role in influencing and promoting individual citizens choices to adopt such sustainable lifestyles and consumption habits. This indicates neoliberal attributes, such as "consumption pattern", relating to market-oriented values of citizenship. Moreover, the European single market is explicitly phrased as a strength (p.1, Digital Compass). *"Also, Europe's action on robotics must capitalise on the latest AI developments to address innovation and standardisation, issues of trust, skills shortages and impact on jobs and on the environment [...]."* (p.46, Coordinated Plan on AI). In this sentence, the aspect of capitalism is highlighted and a need for it is expressed, which is one distinct feature of the neoliberal notion. Interestingly, this need for keeping up with innovation is portrayed as a step to tackle unwanted development of AI, which could harm citizens, meaning that innovation shall prevent harm for citizens.

Closely linked to that, another reoccurring pattern found in the EU documents was risk. Through the rapid speed of technological development, a lot of risks occur, which affect citizen. More specifically, citizens are at risk to be a victim of the occurring new digital divide and digital poverty. The digital divide is characterised by the imbalance between people who cannot access digital technologies and people who take the full advantages of or even profit from digital technologies such as AI for sustainability, which can ultimately cause new digital poverty. Thus, the goal for 2030, according to the Digital Compass, is achieving a "*digital society where no-one is left behind*." (p.2, Digital Compass).

Another theory reflected in EU policy documents is the theory of communitarian citizenship. The theory's main components, including the importance of serving the common good and ethics are found to be reflected in the EU documents, for example in the following quote, stating that "*[...] a new" digital poverty", making it imperative to ensure that all citizens and businesses in Europe can leverage the digital transformation for a better and more prosperous life. The European vision for 2030 is a digital society where no-one is left behind."* (p.2, Digital Compass). The stress on leaving no-one behind and the aim to have benefits for all citizen is indicating the presence of the communitarian theory on citizenship in the EU policy discussions. This reflects the aim for the common good for the society,

which is representing the notion of communitarian citizenship. Leaving no-one out implies that the benefits of AI technologies shall apply equally for all citizens.

Further risks concerning AI for Sustainability, targeting citizen, is the unclarity about unintended effects or malicious uses of Artificial Intelligence (p.10, White Paper). These insecurities and concerns are evoking a fear in citizen, resulting in a feeling of powerlessness among citizens. The pushing factors for such fears are a lack of trust and digital literacy. Furthermore, there is a risk of being dependent on privately owned tech firms and a risk of misinformation spreading which could threaten democracy. Thus, the need to protect citizen is stressed throughout the different documents. Citizens are perceived as endangered and in need of protection. Under this protection fall the citizen's right to prevention of harm, their physical and mental well-being, their human dignity, as well as private data protection rights (p. 12, High level expert group). Another identified risk that concerns citizen are automatic identification technologies powered by AI. Not only can those be biased, but also through lacking reliability they can endanger the legality and ethical use of AI, which can influence citizen negatively on sociocultural and psychological levels. This threat can also be found in procedures like citizen scoring with AI tools. Those can result in discrimination, caused by violation of basic rights including freedom and autonomy. To tackle this problem transparency towards citizens is crucial to make them aware of the functioning of AI systems and the risk and opportunities related to it. Considering these risk, Ursula Von der Leyen, president of the European Parliament, formulated goals for the EU to be digitally sovereign, including "*leadership in ethical artificial intelligence*" and a "*secure digital identity for all*" amongst others (p.1, Digital Compass). Those risks can be associated with the libertarian rights-based citizenship, in the sense that the values of this notion on citizenship, such as autonomy, are endangered by the risk of surveillance and pose threats to the autonomy of citizens. Thus, as clarified in the policy, there is the need to protect the citizen's rights by law. Paradoxically, according to the EU, AI holds immense potential to improve citizen's security, protection, assistance, and emergency response.

Furthermore, AI holds astounding advantages for citizen, such as improved efficiency and productivity, which can improve the citizens well-being and are able to focus on societal challenges including sustainability and climate change (p.26, White Paper on Artificial Intelligence). Additionally, citizen involvement can be improved with the help of AI, which brings new opportunities for citizens to involve in planning decisions. According to the Digital Compass, digitalization can even facilitate rights and freedoms of citizens, by decreasing the magnitude of geographical proximity. (p.2, Digital Compass) To reach its full potential for citizen, AI must be trustworthy. Creating trustworthiness of AI entails accounting for citizen's rights and following ethical standards, one of which is meaningful consent (p.33, High Level Expert Group on AI), which entails that citizen shall be confident enough with AI and their rights related to that to make a grounded decision. The strong focus on lawfulness and the theory represented in the EU policies, points towards the libertarian rights-based citizenship, which

can be found in phrases like: *"Enabling citizens to actively decide, who can use their data and for what purposes, combined with trustworthy technologies, processes and actors, can also create incentives to share or generate such data."* (p.40, Role of AI in Green Deal) or "*Its central concern is to identify how AI can advance or raise concerns to the good life of individuals, whether in terms of quality of life, or human autonomy and freedom necessary for a democratic society*." (p. 9, High level Expert group on AI). The focus of this theory of citizenship, which emphasizes on autonomy of citizens, thereunder individual freedoms, rights, and protection, can be found in the document, phrased as high importance of citizen's rights and protection of rights. Especially the aspect of protecting the individual citizen's autonomy regarding AI for sustainability is highly represented.

Overall, the way citizens are framed within the documents indicates the presence of multiple theories of citizenship within EU policies. These observations are supported by patterns in wording and phrasing. Overall, citizenship is portrayed in many ways throughout the policy discourse on AI for Sustainability in the European Union. Notable patterns include active participation of citizen, citizen empowerment through education, inclusivity, and protection of citizen, which are connected to multiple theories of citizenship, specifically neoliberal citizenship, civic republican citizenship, libertarian citizenship, and smart/digital citizenship. Interestingly, the factors risk and chances of AI closely linked regarding citizens.

4.4 National level policy - German Government

When looking for the role of citizen, as presented in German policy documents on AI for Sustainability, the main thematic patterns to be found are "*AI for all*", skilled citizen, Trustworthy AI, and the risk of AI for citizens. These topics already give a hint towards what the predominant perceptions on citizen within the national policy discussion in Germany might be.

First, the German federal government points out, that AI should be for all. AI shall serve the common good and benefit the whole society, not only private interest. This plan is elaborated on in the 5 Points Programme, which even goes a step further and describes AI as a tool to reach common good. This claim with its emphasis on the common good, resembles the theory of communitarian citizenship. Additionally, the five points programme sets a focus on involving citizen and other non-governmental actors, who are already committed to climate action (p.4, Five Points Plan). By explicitly mentioning the preexisting interest and dedication, not all citizens are meant to be included actively, but only a narrow group of people is targeted to be involved. However, input from intrinsically motivated citizen is highly valued in order tackle climate change related issues. The aim is not to extrinsically motivate every citizen to participate, but to work with preexisting skills and equip these citizens with tools for

further enhancing those skills and enabling them to network. An example of such a tool is a social innovation platform, which is enabling citizens to execute AI-related initiatives coming from the civil society itself. This initiative shows the aim for an active role of citizen within the AI for sustainability development. Furthermore, by further addressing skill development, particularly digital literacy among citizens, the government seeks to make participation in environmental challenges more accessible to citizens (p.2, KI-Aktionsplan). This aim coheres strongly with the theory of smart citizenship, due to the stress on digital literacy, which is one of the main attributes of smart citizenship. Key to this is the education of citizens, which is the second pattern to be found within the documents. AI in this discourse is framed as a facilitator for citizens to become more educated and active on climate and sustainability. AI's ability to comprise and analyse large data sets, supported by evidence-based knowledge, enhances efficiency of citizen participation (p.4, Five Points Plan). The 5 Points Plan emphasizes the need for supplying citizens with knowledge and skills needed to be able to contribute to sustainability, which is contrasting the earlier mentioned goal of the 5 Points Plan to rely on preexisting skills and drive of citizen.

Next, the communitarian approach to citizenship is observable in the German policies as well. Phrases, such as *"AI for all - oriented towards the common good and environmentally friendly [...]"* (p.4, 5-points-programme), which explicitly emphasize wordings "for all" and "common good" point towards the stress on the community, serving the communities' interests. Initiatives such as Civic Coding are also striving to foster education on AI throughout the entire population to improve the collaboration between the government and the civil society, which is seen as a key to achieving AI for the common good (p. 4, Civic Coding). The common good refers to serving the society's common interests, rather than fulfilling the interests of private groups or individuals (p.9, Civic Coding). Moreover, the civic coding strategy seeks to distribute information to citizens to educate and facilitate citizens, but this approach makes a division between users and implementers versus interested people. While users and implementers of AI technologies, in different words, more advanced citizen, shall get specific information related to the certain subjects for their work with AI, interested people shall receive access to basic information and information on where to gather further knowledge, when interested (p.9, Civic Coding). The contrast between "receiving information" and "receiving access to information" can be interpreted as active and passive acquisition of information. However, by targeting citizen with different groups of citizens, AI shall not only be more diverse, but also gain acceptance from within the society and spark public debate (p. 9, Civic Coding). Furthermore, "working together" is supposed to achieve the common good (p.7, Civic Coding), which entails collaboration between the government and civil society. Additionally, it is stated that the benefit of AI shall cater "as many people as possible" (p.7, Civic Coding), which again relates to the notion of communitarian citizenship. The focus throughout the documents clearly lays on the benefits of people and the environment, which strengthens the perception of communitarian citizenship, because of the attention to the benefits for community, for

the people. Surprisingly, AI is described in a very positive and optimistic way, which needs steering, but has rather good intentions. This claim is supported by government official Bettina Stark-Watzinger, who claims that AI holds enormous potentials for the society (p.1, KI-Aktionsplan). She addresses the contrasting public discourses revolving around AI, one of which is highly pessimistic, the other one highly optimistic. Her position is clear, she is optimistic and sees AI as a chance (p.1, KI-Aktionsplan).

The next reoccurring topic found in the German policy documents, is "Trustworthy AI." The German government published the concept of "Trustworthy AI, made in Europe," which focusses on transparency and citizen involvement and refers to a quality branding, which expresses the aim for excellence of German and European AI (p.1, KI-Aktionsplan). Outstanding quality of AI shall contribute to more trust in technology among the citizens. Also, transparency in developing AI technologies, including the research, but also the innovation funds mobilized for AI development, is crucial to create public trust and even participation (p.45, The New High-Tech Strategy Innovations for Germany). Furthermore, an open exchange between the government and citizens is encouraged, with the aim to inform citizens about AI to an extent that allows them to make informed decisions about AI. The Civic Coding strategy goes a step further by intending to have repeated consultations with actors from the civil society, of which the results are communicated transparently to the citizen afterwards (p.6, Civic Coding). These descriptions, with the strong emphasis on transparency, lead to the assumption that the notion of civic republicanism is also represented in German policy.

However, despite the strong focus on the chances of AI for citizen, the policies also recognise the possibility of AI developing towards an undesirable direction, creating risks for citizens. Risks mentioned in the policy documents include concerns about personal freedoms, privacy, and data protection, as well as multiple forms of discrimination against certain groups of individuals and threats to cybersecurity. Despite those risk the government remains optimistic that with the right steering of AI it will develop towards a desirable direction, by using the existing AI strategies to limit the risks. The focus lays on minimizing the risks for individuals, for citizens. Therefore, protective measures to ensure the citizens' rights to privacy data control and protection and personal freedom are maintained in security (p.40, Artificial Intelligence Strategy). These descriptions on the risk citizens are facing, and the need to protect the citizens individual rights are suggesting that libertarian rights-based citizenship is also represented in these policies.

Overall, Germany's national strategies on AI for sustainability are focussing on the common good, digital literacy and education of citizen Trustworthiness of AI and citizen-related risks. The related strategies found in there were the communitarian citizenship, the smart citizenship, the civic republican citizenship, and the libertarian rights-based citizenship. Interestingly, the German government has notably positive attitude towards AI, mainly focussed on its strengths and opportunities.

4.5 Local level policy – German Smart Cities

This section will inspect the local level policy, more specifically in five German smart cities, searching for citizens' roles AI for sustainability approaches on the local level. Due to their innovative nature and citizen focused standing smart cities are an especially important actor to analyse when searching for the meaning of citizenship. When analyzing the role and perception of citizen in the different city's strategies, one reoccurring topic was that citizen are fundamental to the success of city's initiatives. As Arnsberg claims, a (smart) city is only as smart as the people in that city, further elaborating that anyone can be smart, when they aim to help making the city more livable (p.7, Arnsberg). This strongly relates to the notion of smart citizenship, just as the focus on education within the local level policy in which the cities aim for an informed citizenry. In the Bamberg strategy, it is claimed that citizens are enabled to take informed decision through education, of which the necessity is stressed as well (p.6, Bamberg). Citizen education can also raise attention and sensitivity to environmental issues, also enabled by intelligent net infrastructure (p.32, Gelsenkirchen).

Moreover, the city aims for collaboration with their citizen, acknowledging and appreciating the knowledge and abilities of their citizens, emphasizing the power of sharing knowledge (p.7, Arnsberg). Not only transparency, but moreover also exchange between the government and citizens should be fostered. Togetherness in the sense that the government includes citizens extensively in the strategy and policy-making process, in some cases even in decision making, is what Bamberg believes is the key to successful policymaking and implementation (p.17, Bamberg). However, transparency is what fosters exchange in the first instance, not only relating to citizen being informed about the decision making, but also being involved in it. This lays an emphasis on the active role of citizen. To achieve this, it is necessary to lay an emphasis on trust between citizens and the government, which is essential to fostering proactiveness among citizens (p.17, Bamberg). This illustrates a vision on citizenship, that is coherent with the assumption of civic republican citizenship, in which transparency and dialogue between government and citizens can foster participation and valuable insight for policymaking for the common good.

Additionally, the diversity of citizens in a key in the strategy forming process of Bamberg. As many and as diverse citizen as possible shall be consulted to ensure that first of all, all the diverse needs and perspectives of citizens are being recognized and then considered within the strategy-forming process, which results in more comprehensive strategies and a higher degree of representation of citizens in the strategy (p.17, Bamberg). Bamberg sets the emphasis on "all citizens", in terms of who shall be considered when planning the future of the city (p.3, Bamberg). The same counts for Gelsenkirchen, which claims *"The connected city is for all*" (p.15, Gelsenkirchen), emphasizing the cruciality of inclusivity. Moreover, by placing the citizen in the center of the strategy, a strong commitment to participation and inclusivity is expressed. Including all citizen, from all parts of the population, all actors of the civil urban society, making sure that every of these stakeholders has a voice

within the development process, is what the focus shall be on, which can be fostered by increased social connectedness among others (p.15, Gelsenkirchen), which again is dependent on the engagement of citizens. The social connectiveness is a key factor in achieving an equal distribution of benefits of AI and sustainability among the population, among all citizens. Thus, inviting and enabling citizens to actively participate in the decision-making process, is fundamental. This can be applied to the field of decision-making and strategy-forming on AI and Sustainability. Regardless of what policy area, successful strategies depend on participation and acceptance and trust among citizens. Citizens are perceived as not taking a passive role, benefiting from top-down decision-making, but as active and even as a driving force of change within the city. These descriptions of the perception of citizens, relate to communitarian citizenship, due to the emphasis on citizens engagement in relation with inclusivity and the social connectedness.

Another observable pattern found in the cities' strategies is the common good for people. In Gelsenkirchen strategy the goals are described as "enhancing the quality of life, acting in the sense of the common good, the focus on demand, reliability, and sustainability" (p.47, Gelsenkirchen). Moreover, intelligent systems shall contribute to improved services for citizen (p.47, Gelsenkirchen). Additionally, such intelligent systems can reduce burdens on the environment and humans (p. 13, Gelsenkirchen). Furthermore, risks and burdens are another aspect, which is mentioned frequently throughout the strategies. There is a multitude of risk mentioned by the cities that concern citizens, more specifically health risks. However, those are not caused by AI for sustainability, but aimed to be tackled by Intelligent systems. Gelsenkirchen claims that the main aspects threating citizens' health are air pollution in general and more specifically particulate matter pollution, which shall be monitored and thereby being improved by AI systems (p.33, Gelsenkirchen). Central aspects of improving their citizen's health are the reduction of emissions, sufficiency, support of local energy transition and the maintenance of urban greenland (p. 32, Gelsenkirchen).

Overall, the smart city strategies, even though they have different foci to some extent, are all keen on involving the citizen in their city development.

4.6 Conclusion of Analysis

The key insights gained by conducting this analysis are, first, on the global level policy making, primarily notions of communitarian citizenship. The emphasis on the common good of the UN, was consistent throughout the various policies, with the most dominant theory of citizenship being the civic republican citizenship. Another theory, the libertarian rights-based citizenship was also found in the policies of the UN.

Next, the European Union's policies have revealed a dominance of neoliberal perspectives on citizenship on the one hand, and on the other hand a complex, intermingled nature of perceptions of

citizenship, revealing in total four theories on citizenship being represented in the policies, however those were partially interrelated or mentioned within the same run of thought, so that the distinction between each theory became rather shallow. Then, the German government's policies focussed on the civic republican citizenship, the smart citizenship, communitarian citizenship and libertarian rights-based citizenship. Lastly, the local level, smart city frameworks concentrated on citizen involvement, citizen participation methods, highlighting the concept of civic republicanism the most, but communitarianism citizenship and smart citizenship are also represented through a strong focus on the values for the civic society and the emphasis on education of citizens.

5 Conclusion

In this chapter the answer to the research question and the new insights on the research gap, the limitations to this research and suggestions for future research will be presented.

5.1 Main findings

The answer to the research question will be formulated and elaborated in this section. The results of the analysis of the *"What is the envisioned role of citizens in the process of realizing AI solutions for sustainability as portrayed in policy discourses of the UN, the EU, German federal and German smart cities?"* The individually considered levels of policy revealed predominant theories on citizenship, which were different to each other. The global level revealed the presence primarily of civic republican citizenship, in combination with libertarian rights-based citizenship and individual aspects of neoliberal citizenship. The European level in contrast revealed a predominance of neoliberal citizenship, together with smart citizenship, civic republican citizenship, communitarian citizenship and the libertarian rights-based citizenship. The German policies represented the theories of civic republican, communitarian, libertarian right's based and smart citizenship. Lastly, the local smart city policy revealed a majority of civic republican influence on the perception on citizenship, but communitarian and smart citizenship were also included in the policy strategies on the local level.

Throughout all levels of policy, there was a complex set of theories and notions on citizenship to be found, some showed a dominant notion on citizenship, like the EU, while other policy levels showed attributes of all theories included in the research to an equally distributed extent. The most frequently appearing theory on citizenship was the civic republican citizenship. Interestingly, even though the research was on the topic of artificial intelligence for sustainability, the notion of smart citizenship was not as dominant as expected. Additionally, throughout the distinct levels of policy, the thematic patterns were not varying a lot. Some levels had a stronger emphasis on one specific topic of interest, for example the smart cities strong focus on citizen participation methods. The thematic patterns also turned out to overlap with a consecutive theory on citizenship.

To conclude, the research has shown that there is not a single theory of citizenship that covers all aspects of citizenship in the context of AI for sustainability. Citizenship for AI for sustainability is embedded in a complex set of theories on citizenship.

5.2 Research contributions and limitations

This research could add to the status quo by highlighting the importance of investigating into the role of citizens in AI for sustainability. The research revealed the occurrence of the five selected theories on citizenship within the multi-level governance framework, each in different extents within different levels of policy. The main learning is, that the role of citizen in AI for sustainability policy is a multifaceted compound set of several aspects of contemporary theories on citizenship. Citizens are perceived as taking an active role in governance of AI for sustainability.

A limitation to the research is, that the focus laid on passages within the policies that were related to citizen, most of the time even specifically mentioned citizen. Quotes without notion of citizen were not included in the analysis, however not mentioning citizen in certain contexts also expresses a perception of citizenship. This view on the importance of involving citizens remains undiscovered. Moreover, only five theories on citizenship were selected to be investigated in due to the limited scope of a Bachelor's assignment. More theoretical background might have revealed more interesting insights into the different notions on citizenship throughout different academic fields. Furthermore, a deeper theoretical understanding of the interrelatedness of each notion of citizenship in social and political theory would have contributed to a more comprehensive approach on the constellation of citizenship. In this research, the selection of notions on citizenship was based on a paper, however, two of the theories, namely, the communitarian and the civic republican are quite interrelated with each other. This made the clear distinction between notions of citizenships quite challenging.

Additionally, retrospectively, another level of policymaking could have been addressed considering the federal nature of the selected case of Germany. This would have been the federal state level (Bundesländer), which also have some individual authorities within the complex multi-level governance framework. Comparable to the local level, this level of governance is ought to contribute bottom-up approaches to AI for sustainability and has a strong focus on strengthening the region.

5.3 Suggestions for future research

Reviewing the results of this research, potential future research could be directed. The most obvious suggestion for future research is the conceptualisation of citizenship in Artificial Intelligence for Sustainability. Moreover, the impact of the multi-level governance framework on citizenship could be researched further, to understand how the complex system public-policy networks influences citizenship, citizens' perceptions on citizenship, citizens' participation, citizens' identity etc. Additionally, theories, such as deliberative democracy or do-ocracy could be further embedded in the analysis to investigate different notions of governance within the AI for sustainability discourse.

Furthermore, this analysis could be further extended to different contexts, also addressing AI for sustainability in less developed regions of the world. While this analysis had an European focus, future studies can apply the foundations of this analysis to any other case within the multi-level governance framework, or the focus could be set onto a smaller scale by focussing on only a portion of this policy-making complex, to then delve deeper into the complex interplay between AI for sustainability and citizens.

Moreover, future research could focus on the growing digital divide, factors that influence it, measures that prevent the growth of it. That AI can contribute to the digital divide is already known, but what other factors play a role in this widening gap, leading to digital poverty is yet to be elaborated in the context of AI for sustainability. While some claim that AI has potential to bridge global gaps, many (World Economic Forum, 2024), others claim that AI poses a threat to widen this gap (InformationWeek, 2023). Then, in that regard, more factors than level of policymaking and theory on citizenship could be researched on.

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Appendix

UN

Global Sustainable Development Report

"*Large-scale societal change is often achieved first in people's hearts and minds, through social organization and mobilization at the grassroots level, and only afterwards enshrined in legislation and economic policies*." (p.46, UN)

"*But if a critical mass of people adopt an innovation, practice, norm or behaviour, along with collective action by social movements and coalitions, this can be enough to draw in the rest of the population*." (p.46, UN)

"*In addition, while the increasingly sophisticated and powerful digital transformation provides new opportunities to reach the Sustainable Development Goals, risks such as the misuse of artificial intelligence to spread misinformation or inaccuracies should be carefully addressed. Potential legal and ethical issues around privacy, as well as data collection and biases that tend to be built into machine learning technologies, also require attention*." (p.26, UN)

"*However, the benefits of digital transformation to communities and individuals have been uneven*." (p.26, UN)

"*Digitalization can help bring visibility to important issues by making things measurable; it can help identify where people are left behind and what types of resources are needed." (p.26, UN)*

"They can also target people living in poverty, persons with disabilities, older individuals, immigrants, women and youth." (p.25, UN)

UN AI Advisory Body Interim Report

"*The opportunities and the risks of AI for people and society are evident and have seized public interest."* (p.2, UN)

"*There is a real danger, even if humanity harnesses only the positive aspects of AI, that those will be limited to a club of the rich. Today's AI benefits are accruing largely to a handful of states, companies, and individuals*." (p.2, UN)

"*This technology cries out for governance, not merely to address the challenges and risks but to ensure we harness its potential in ways that leave no one behind.*" (p.2, UN)

"[...] citizen-reported data on effects of hyperlocal climate change – can be used to create new understanding of inputs, consequences, and the complex systems which drive climate outcomes." (p. 3, UN)

"*Providing communities impacted by climate change vulnerabilities access to AI generated predictions that would otherwise only be provided to private companies*." (p.4, UN)

"Lowering cost of compute and machine learning expertise so that nonprofits and civil society can build and sustain free and open AI products." (p.4, UN)

" More inclusive engagement is needed, however, as many communities — particularly in the Global South or Global Majority — have been largely missing from these discussions, despite the potential impact on their lives. A more cohesive, inclusive, participatory, and coordinated approach is needed, involving diverse communities worldwide, especially those from the Global South or Global Majority." (p. 4, AI Advisory Body)

"Enablers therefore require a values-based approach that prioritizes community interests, a combination of technical and problem-based expertise, and a comprehensive approach to new AI development." (p. 4, AI advisory body)

"AI must be governed in the public interest" (p.15, AI advisory body)

"Governing in the public interest also implies investments in public technology, infrastructure, and the capacity of public officials." (p.17, AI advisory body)

"Civil society, including academia and independent scientists, would play key roles in building evidence for policy, assessing impact, and holding key actors to account during implementation." (p.18, AI advisory body)

"We encourage constructive engagement from anyone with an interest in AI." (p.24, AI advisory body)

Paris Agreement

"Also recognizing that sustainable lifestyles and sustainable patterns of consumption and production, with developed country Parties taking the lead, play an important role in addressing climate change" (p.3, Paris Agreement).

"Parties shall cooperate in taking measures, as appropriate, to enhance climate change education, training, public awareness, public participation and public access to information, recognizing the importance of these steps with respect to enhancing actions under this Agreement." (p. 15, Paris Agreement)

"Recognizes the need to strengthen knowledge, technologies, practices and efforts of local communities and indigenous peoples related to addressing and responding to climate change, and establishes a platform for the exchange of experiences and sharing of best practices on mitigation and adaptation in a holistic and integrated manner; [...]" (p.53, Paris Agreement)

New Urban Agenda

"We will promote the development of national information and communications technology policies and e-government strategies, as well as citizen-centric digital governance tools, tapping into

technological innovations, including capacity-development programmes, in order to make information and communications technologies accessible to the public, including women and girls, children and youth, persons with disabilities, older persons and persons in vulnerable situations, to enable them to develop and exercise civic responsibility, broadening participation and fostering responsible governance, as well as increasing efficiency." (p. 39, New Urban Agenda)

"We will support science, research and innovation, including a focus on social, technological, digital and nature-based innovation, robust science-policy interfaces in urban and territorial planning and policy formulation and institutionalized mechanisms for sharing and exchanging information, knowledge and expertise, including the collection, analysis, standardization and dissemination of geographically based, community-collected, high-quality, timely and reliable data disaggregated by income, sex, age, race, ethnicity, migration status, disability, geographic location and other characteristics relevant in national, subnational and local contexts." (p. 39, New Urban Agenda)

"We will foster the creation, promotion and enhancement of open, user-friendly and participatory data platforms using technological and social tools available to transfer and share knowledge among national, subnational and local governments and relevant stakeholders, including non-State actors and people, to enhance effective urban planning and management, efficiency and transparency through e-governance, approaches assisted by information and communication technology, and geospatial information management" (p. 40, New Urban Agenda)

DRAFT TEXT OF THE RECOMMENDATION ON THE ETHICS OF ARTIFICIAL INTELLIGENCE

"*These AI systems should involve the participation of local and indigenous communities throughout the life cycle of AI systems and should support circular economy type approaches and sustainable consumption and production patterns." (p. 30, UNESCO)*

"Learning about the impact of AI systems should include learning about, through and for human rights and fundamental freedoms, meaning that the approach and understanding of AI systems should be grounded by their impact on human rights and access to rights, as well as on the environment and ecosystems." (p. 24, UNESCO)

"AI actors should play a participative and enabling role to ensure peaceful and just societies, which is based on an interconnected future for the benefit of all, consistent with human rights and fundamental freedoms. The value of living in peaceful and just societies points to the potential of AI

systems to contribute throughout their life cycle to the interconnectedness of all living creatures with each other and with the natural environment." (p. 21, UNESCO)

"Furthermore, environment and ecosystems are the existential necessity for humanity and other living beings to be able to enjoy the benefits of advances in AI." (p. 20, UNESCO)

EU

Coordinated Plan on AI Review

"[…] *better setup, integration and management of the energy system and empowering businesses, public authorities and citizens to choose the most sustainable and efficient energy options; [...]" (p.39, Coordinated Plan on AI)*

"AI-powered urban solutions is one example where cities and communities can benefit from AI to achieve environmental and climate objectives." (p.39, Coordinated Plan on AI)

"[...]ensure that the environmental dimension is included in Digital Europe actions that seek to make AI applications broadly available to potential users across Europe: [...]" (p.40, Coordinated Plan on AI)

"Also, Europe's action on robotics must capitalise on the latest AI developments to address innovation and standardisation, issues of trust, skills shortages and impact on jobs and on the environment, in order to enable the roll out of safe, secure and trustworthy robotics solutions." (p. 46, Coordinated Plan on AI)

"Use of AI systems can bring benefits across all key public-sector activities. Through early adoption of AI, the public sector can be the first mover in adopting AI that is secure, trustworthy and sustainable." (p.48, Coordinated Plan on AI)

"The fast development and uptake of innovative AI in the EU can contribute to solving key societal challenges and accelerate the digital and green transitions at a time when the global AI landscape is evolving fast." (p. 58, Coordinated Plan on AI)

Artificial Intelligence in Smart Cities

"Among others, AI applications can improve and innovate water and energy infrastructures, urban services and promote empowered and resilient communities in smart cities. However, local governments, citizens and other smart city stakeholders face several challenges when it comes to the implementation of those applications." (p.2, Artificial Intelligence in Smart Cities)

"[...]while citizens are supported in adopting flexible and efficient energy consumption patterns which benefits the households and the grid." (p.3, Artificial Intelligence in Smart Cities)

"Citizen Energy Communities (CEC) are introduced in the Clean Energy Package (CEP) and play an important role in the Green Deal as a new market party to engage and empower citizens and amplify the local enthusiasm and resources towards local, sustainable and reliable energy systems." (p. 5, Artificial Intelligence in Smart Cities)

"*From a citizen-science perspective, local initiatives take a more bottom-up approach (thus control) over energy systems." (p.5, Artificial Intelligence in Smart Cities)*

"The role of digitisation and AI in such processes could be multiple: from aiding citizens initiatives with asset management and community platform building, [...]." (p.5, Artificial Intelligence in Smart Cities)

-"Public sector plays a crucial role to ensure the AI solution to be inclusive and secure, counting on reliable, non-biased, fairly shared data, still preserving EU citizens' privacy." (p. 6, Artificial Intelligence in Smart Cities)

"Increased responsibility for citizens in local initiatives resulting in increased the risks of mistakes due to lacking skills or due to incorrect information." (p. 10, Artificial Intelligence in Smart Cities)

White Paper on Artificial Intelligence

"[...] *for services of public interest, for example by reducing the costs of providing services (transport, education, energy and waste management), by improving the sustainability of products and by equipping law enforcement authorities with appropriate tools to ensure the security of citizens, with proper safeguards to respect their rights and freedoms." (p.3, White Paper on Artificial Intelligence)*

"Digital technologies such as AI are a critical enabler for attaining the goals of the Green Deal." (p.3, White Paper on Artificial Intelligence)

"AI offers important efficiency and productivity gains that can strengthen the competitiveness of European industry and improve the wellbeing of citizens. It can also contribute to finding solutions to some of the most pressing societal challenges, including the fight against climate change and environmental degradation, the challenges linked to sustainability and demographic changes, and the protection of our democracies and, where necessary and proportionate, the fight against crime." (p. 26, White Paper on Artificial Intelligence)

"AI should work for people and be a force for good in society." (p. 26, White Paper on Artificial Intelligence)

Role of AI in the Green Deal

"Finally, AI applications could offer new potential to better involve citizens in planning decisions." (p. 22, Role of AI in the Green Deal)

"Given the paramount importance of participation, acceptance and policy communication, especially for green transformation approaches, such applications could play an important role in the context of the EGD." (p.22, Role of AI in the Green Deal)

"*Enabling citizens to actively decide, who can use their data and for what purposes, combined with trustworthy technologies, processes and actors, can also create incentives to share or generate such data."* (p.40, Role of AI in Green Deal)

High level expert group on AI

"*Its central concern is to identify how AI can advance or raise concerns to the good life of individuals, whether in terms of quality of life, or human autonomy and freedom necessary for a democratic society." (p. 9, High level Expert group on AI)*

"*Trustworthy AI can improve individual flourishing and collective wellbeing by generating prosperity, value creation and wealth maximization. It can contribute to achieving a fair society, by helping to increase citizens' health and well-being in ways that foster equality in the distribution of economic, social and political opportunity." (p. 9, High level Expert group on AI)*

"[...] fundamental rights therefore fall under the first component of Trustworthy AI (lawful AI), which safeguards compliance with the law." (p.10, *High level Expert group on AI)*

"*Particular attention must also be paid to situations where AI systems can cause or exacerbate adverse impacts due to asymmetries of power or information, such as between [...] governments and citizens*." (p.12, *High level Expert group on AI)*

"New technological, economic and environmental changes mean that society needs to become more proactive." (p.33, High level expert group on AI)

"*Governments, industry leaders, educational institutions and unions face a responsibility to bring the citizens into the new digital era ensuring they have the right skills to fill the future jobs*." (p.33, High level expert group on AI)

-"*AI can be a great tool to fight educational inequalities and create personalised and adaptable education programmes that could help everyone acquire new qualifications, skills and competences according to his or her own ability to learn. It could increase both the learning speed and the quality of education – reaching from primary school to university*." (p.33, High level expert group on AI)

"*AI systems will continue to impact society and citizens in ways that we cannot yet imagine*." (p.35, High level expert group on AI)

"[...]*securing human flourishing of European citizens, both individually and collectively." (p.35,* High level expert group on AI)

Green Deal

"*It will be important to ensure that across the EU, investors, insurers, businesses, cities and citizens are able to access data and to develop instruments to integrate climate change into their risk management practices*." (p.5, Green Deal)

Digital Compass

"Europe will have to build on its strengths – an open and competitive single market, strong rules embedding European values, being an assertive player in fair and rule-based international trade, its solid industrial base, highly-skilled citizens and a robust civil society." (p.1, Digital Compass)

"*The European way to a digitalised economy and society is about solidarity, prosperity, and sustainability, anchored in empowerment of its citizens and businesses, ensuring the security and resilience of its digital ecosystem and supply chains."* (p.2, Digital Compass)

"*In this sense, the COVID-19 pandemic has exposed a new "digital poverty", making it imperative to ensure that all citizens and businesses in Europe can leverage the digital transformation for a better and more prosperous life. The European vision for 2030 is a digital society where no-one is left behind."* (p.2, Digital Compass)

Connecting Smart and Sustainable Growth

"*Authorities can encourage their citizens to adopt sustainable lifestyles and consumption patterns by integrating intelligent city planning which promotes mobility solutions like bike or car sharing, green districts or industrial symbiosis programmes*." (p.31, Connecting Smart and Sustainable Growth)

<u>Germany</u>

5-Punkte-Programm

"*AI for all - oriented towards the common good and environmentally friendly to promote dialogue with AI developers, equip environmental activists and other interested parties with AI expertise and support them in their own AI projects, the BMU is setting up a platform for social innovation and AI idea workshops (Civic Tech Labs for Green) for environmental protection*." (*p. 4, 5-Punkte-Programm,* ***translated****)*

The New High-Tech Strategy Innovations for Germany

"The key to intensifying participation by all stakeholders – [...] general public – is to transparently document and present research and innovation funding. Transparency facilitates dialogue, promotes balanced consideration of opportunities and challenges, and fosters openness to new things." (p. 43, New High Tech Strategy Innovations for Germany)

Artificial intelligence strategy

"We want to use the potential of AI further to improve security, efficiency and sustainability in particularly important fields of application whilst also promoting social and cultural participation, freedom of action and self-determination for each and every citizen, both here in Germany and at European and global level." (p.9, Artificial Intelligence Strategy)

"Potential risks include the use of AI technology in way that violates personal freedoms, the right to control one's own data, privacy and data protection, the use of loopholes in security systems (cyber-attacks) and various forms of discrimination." (p. 40, Artificial Intelligence Strategy)

Cities

Gelsenkirchen

„Die Vernetzte Stadt ist eine Stadt für alle Gelsenkirchenerinnen und Gelsenkirchener." (p. 15)

Arnsberg

"Zusammen sind wir klüger." (p.7, Arnsberg)

"Städte sind für Menschen da und so smart, wie die Menschen vor Ort." (p.7, Arnsberg)

Bamberg

"The aim of the Smart City programme is for the city itself, i.e. the citizens, to have sovereignty over the city's data and not companies that base their actions on economic orientate their actions towards economic goals." (p.6, Bamberg, ***translated***)

Leipzig

"We will not lose sight of the fact that people are at the centre of our considerations." (p.A-7, Leipzig, ***translated***)

Krefeld

"*Technology is a means to an end: the focus is on people."* (p. 21, Krefeld, ***translated***)