

# An Understanding of Inter and Transdisciplinary Aspects of Urban Resilience

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## Abstract

Over the past two decades, there has been a growing interest in the practice of transdisciplinary research, especially in the social sciences. However, the answer to the question of whether we have achieved interdisciplinarity is definitely not affirmative. However, interdisciplinary research is needed when information about a topic and the problem it creates is socially unclear, or when the concrete nature of the problems deteriorates and a lot of things are at stake for those who are interested in these issues and those who have worked on them. Examples of such topics can be listed as poverty, health, immigration, cultural transformation, bioengineering of new crops, and climate changes which is one of the safety indicators of all these issues. In cities with a large population, these issues are more noticeable than in the countryside. However, there are problems everywhere. Interdisciplinary approaches aimed at creating knowledge that exceeds the boundaries of those disciplines and integrating methodologies belonging to different disciplines begin to work by acknowledging the decoupling that results from the interaction between researchers and stakeholders. Therefore, interdisciplinary research includes interdisciplinary reflections and methodologies, but questions the issues by diving even further into the issue. That is why interdisciplinary research complements applied research in areas characterized by complexity and uncertainty. Urban administrations are an increasingly specialized field, and all types of security problems, especially climate change-induced ones are being studied in order to maintain a healthy urban structure. In this article, the interdisciplinary and transdisciplinary aspect of urban resilience life is pointed out.

## Keywords

Interdisciplinarity, Transdisciplinary Studies, Urban Resilience, Safe City

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## 1. Introduction

Urban administration is an ever-increasingly specialized field and all kinds of security issues, especially those that are related to climate changes are questioned in terms of settlements in order to provide an effective, healthy urban administration. To this day, studies on multifaceted thinking and practice development have been held under numerous names, such as “collaboration”, “governance”, “cooperation”, “integratedness” and etc. In fact, realization of the importance of thematic studies developed around having multiple stakeholders on an issue. Although we can start discussing the act of looking for multifaceted and multidisciplinary solutions since the philosophers of antiquity, it can be said that in modern sense, the Charter of Athens (1933) and the European Urban Charter (1992) are the most comprehensive initial documents in the search for multifaceted or multidisciplinary solutions for urban problems. As a matter of fact, the Charter of Athens starts with the limiting the scope highlighting that they “do not consider the aerial issues as problems and want to consider the soil first.” And this approach is now out-of-date. Integrated questioning involving the social sciences, life sciences and health is evaluated as socio-technical within the multidimensional risk analyses. Healthy urban administrations intertwined with scientific studies. Will scientific studies be able to adequately keep up with this process?

In fact, disciplines have emerged largely with “effort or interest”. This emergence at first seems to be linked with economical requirements based on “agriculture” and “industry” but it is also connected with “intellectual-society 5.0” e-influences. Social, economic, and political networks with time-based interest relationships also affect the shaping of information. Ethical concerns are also important in the production of information within the context of this influence.

Since the last decades of the twentieth century, the hegemonic legacy of the positivist science of the eighteenth and twentieth centuries has been questioned. These thought practices have emphasized the need to create, spread, and manage information through newer systemic epistemological and methodological approaches.

Although western schools of thought have allowed for a great technological and material development for mankind, disciplinary hyper-specialization has taken control of the conceptual and methodological boundaries of epistemological reductionism, on which modern science is based (Weingart & Stehr, 2000). Metaphorically, the transition between 19th and 20th centuries is metaphorically called<sup>1</sup> as the new Babel (Bauer, 2020) by the science community. The scientific knowledge gained in this process has led to an estimated 9000 distinguishable

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<sup>1</sup>The tower of Babel, like the Flood in the holy books, is located in a past that cannot be dated. In the Southern Mesopotamian plain called Shinar in Sami language, the people were experts in building cities and captured in their own fast-paced development of skills, the inhabitants decided on building a tower so tall that reaches up to the sky and becomes a source of pride not just on the face of Earth but also in the eyes of God. This act of insolence brought confusion of language, alienation, and finally war (anonymous information from mythology).

areas of knowledge and the division of science into an infinite number of highly specialized disciplines, which became the reason why Thomas Kuhn's Structure of Scientific Revolutions (SSR) (Orman, 2016) introduced the concept of the immeasurability of knowledge in the history of science. In her statement presented during the First World Congress of Transdisciplinarity in 1994, Julie Klein pointed to information inflation and initiated new epistemological and methodological dialogues that led people to rethink all scientific issues and to more descriptive new approaches. In this regard, in interdisciplinary relations, an epistemic framework based on reconciliation between different areas of knowledge creates the need to establish communication channels that will serve to define concepts. In other words, the desire to develop and transform knowledge by rethinking has strengthened the idea that education based on unilateral communication models in interdisciplinarity and/or the style of "disciplinary loneliness" alone are not sufficient (Adela & Ruano, 2019). The fact that disciplines have little or no interest in each other, and the lack of development of the practice of working in this direction leads to the inability of converting data into information.

In summary, over the past two decades, there has been an increased interest or curiosity in transdisciplinary research and its applications, especially in the social sciences. However, have we been highly successful in interdisciplinary studies? Have we reached our goals in adopting interdisciplinary studies as a new way of thinking and as a multifaceted analysis? Absolutely not. Yet in a network of constantly changing and transforming global and climate-related relations, interdisciplinary research is needed when information regarding a topic and the problem it creates are insufficient or the concrete nature of problems is corrupted and it is easily seen in the life areas or there is a perception of danger for the people who work on these topics and it is obviously seen that chaotic issues cannot be solved with the perspective of a single discipline.

A good example for this phenomenon can be the factual association of climate change which is a security indicator of governance around the issues such as landscape planning, environmental sciences, urban and rural studies, questions raised by cognitive sciences, health, immigration, cultural transformation, etc. In cities and countries where the population is overcrowded, these issues are more noticeable than they are in the countryside. However, there are common and slightly different problems all around the world whether there are people at that location or not and they all deserve scientific attention.

## **2. A Brief Conceptual Approach to Disciplinarity**

This part will first focus on the facts contained in various articles in order to turn them into definitions and then we will explain the development of the idea around transforming the effective research into information.

### **2.1. Studies Based on Multiple Disciplines - Multidisciplinarity**

The multi-disciplinary method integrates a research goal. A thematic research

with multiple goals requires the unity of various academic disciplines. However, while the researchers aim to share the information and compare the results of their studies, there is no attempt or goal to overstep the boundaries or produce new integrative information. Each member participating in the research contributes to the subject from a professional point of view in their own way and with their own knowledge. Each of the disciplinary explanations creates original value with its own method and preserves its own difference (Razzaq, Townsend, & Pisapia, 2013: p 154).

For instance, the issue of managing the artificial insemination of an elephant means that multiple disciplines such as animal psychology, research studies that work on such insemination and its practices come together and do their own job. Although there is a leading discipline within the framework of this study, the other disciplines support is also much needed. Another example could be the studies conducted on the problems related to urban settlements. Here geology leads the way to detect the fault lines so that socio-economic and legal studies have a meaning.

Therefore, the advantage of such an approach is that there are disciplines who dictate how the research needs to be conducted but then just like in the examples of the elephants and fault lines, once the major issue is defined, the other disciplines have the freedom to develop the study according to their interest and in a way that complements the common theme. However, in some studies, such as EIA reports, when each discipline is prepared as a complementary factor to the study in its own method without affecting or coming together with the other (in the multidisciplinary method); we can talk about a method called “passive interdisciplinary”.

## **2.2. Interdisciplinarity**

The interdisciplinary methodology is considered as a superior model of multidisciplinary. In this approach, it is planned to present a methodological approach and data analysis that jointly outlines a problem by bringing together experts and ideas from different disciplines. For this reason, the model requires intensive work based on research with interdisciplinary cooperation, aiming to produce information in this way. Compared to multidisciplinary research, interdisciplinary studies require more performance on problem solving. An interesting feature of the use of the term interdisciplinary is that it is often applied to studies in which a certain chaos is expected in the future or there is a visible danger.

If researchers influence each other and new awareness is formed with regard to the common theme, the approach can be called “active interdisciplinarity” (Karaman & Altay, 1997). Again, according to the author, since foresight will be needed due to the nature of EIA and especially SEA studies, it is possible that an “active interdisciplinary study” may emerge with brand new associations and unity of awareness. In short, “interdisciplinarity” comes into play when a prob-

lem that needs to be solved begins to become complicated. In this kind of work, the specialists of the team should take care of the united study's harmony. We will touch upon this subject again later in this article.

### 2.3. Transdisciplinarity

Transdisciplinary studies are associated with the need for local and regional studies to solve problems that arise or could arise and that create concern. The word trans-disciplinary was first used by the famous Swiss psychologist Jean Piaget at a seminar organized in 1970 at the University of Nice Sophia Antipolis in cooperation with the Organization for Economic Cooperation and Development (OECD) and the French Ministry of Education. In his article on the various types of interactions between disciplines, Swiss philosopher and psychologist Jean Piaget (1896-1980) says, "Interdisciplinary relations do not only includes interactions or reciprocity between experts, they also cover interdisciplinary boundaries." (Nicolescu, 2010) The concept of transdisciplinarity has been generalized in the sense of "coordination of all disciplines".

Jack Lee Mahan's studies (Bernstein, 2015) are based on the review of social sciences philosophy. The studies claim that although the term "transdisciplinarity" is a new term<sup>2</sup>, the concerns that led to searching for such a methodological approach are already present in the articles of scientist of the 20th century Mahan **quotes**.

The general philosophy of transdisciplinary studies was adopted at the First World Congress on Transdisciplinarity, held in 1994 under the title "Charter of Transdisciplinarity". And then the charter becomes the appendix of the Manifesto of Transdisciplinary (2002) of Nicolescu. But in fact, in the Charter, "transdisciplinarity" defines a field of synthesis between and beyond disciplines. In addition to the values of rigor, openness and tolerance mentioned in the Article 14, the deep anthropological importance of interdisciplinarity has been taken into account throughout the Charter (Nicolescu, 2002). In comparison with interdisciplinarity and multidisciplinary, transdisciplinarity is multi-referential and multidimensional.

While taking account of the various approaches to time and history, transdisciplinarity does not exclude a transhistorical horizon (Charter, Article 6), (CIRET, 2020). Key words that emerge throughout the entire charter can be listed as the following: different levels of reality, the emergence of new data by sharing information through communication, cosmic, multidimensionality, chaotic environment and complex problems, person with a transdisciplinary mind, decisiveness, openness, avoiding chauvinism, respecting myths, religion and science, and the problem of moral corruption. In addition to these principles, the author also wants to emphasize that academic awareness of the production of new in-

<sup>2</sup>Similar opinions to the seminar in 1970 mentioned above were produced by Jack Lee Mahan Jr. a 28 year-old master program student working in the field of human behavior in the United States International University. To get further information on his studies see Jack Mahan. "Toward transdisciplinary inquiry in the humane sciences". (United States International University, 1970; as cited in Lawrence, Williams, Nanz, & Renn, (2022: p. 46).

formation by transforming the existing information may also take some time.

The Charter of Transdisciplinarity (1994) also states that the main characteristics of rigor, openness and tolerance are fundamental characteristics of the interdisciplinary attitude and vision. Rigor in the discussion, which takes into account all the existing data, is the best defense against possible distortions. It begins with the acceptance of the unknown, the unexpected and the unpredictable. Tolerance implies accepting the right to have opposing ideas and facts (Nicolescu, 1994). From the same point of view, the Charter invites a person to openness and tolerance in understanding reality, logic, objectivity, time, history, myths, religions, and culture. According to the Article 5 of the Charter; Transdisciplinary vision goes beyond the field of the exact sciences (based on epistemic rights) that “accept an absolute certainty in their results such as mathematics, optics, astronomy and physics. And it positions this approach as being inclusive of humanities and social sciences and open to reconciliation of demands and dialogues of art, literature, poetry, and spiritual experiences. No single culture is privileged over any other culture. The transdisciplinary approach is inherently transcultural” (Article 10). The transdisciplinary ethic rejects any attitude that refuses dialogue and discussion, regardless of whether the origin of this attitude is ideological, scientist, religious, economic, political or philosophical. Shared knowledge should lead to a shared understanding based on an absolute respect for the collective and individual Otherness united by our common life on one and the same Earth (Article 13).

A transdisciplinary study is a stage that requires unity, which is difficult to achieve. Although its importance is recognized, some researchers pick certain subjects (such as landscape) and are very skeptical about whether transdisciplinary studies can be provided in other subjects as well. It is generally noted that the most important feature that distinguishes transdisciplinary studies from interdisciplinary studies is the need to be open to non-expert participants alongside the experts. The methodical approach also unites non-academic stakeholder participants and public or sectoral user groups “such as farmers and shepherds”.

According to the author, it is possible to see that global attention is directed in such studies thanks to the Local agenda 21 created in Rio in 1992. In Turkey, there is well-known example of this share of sectoral user groups as stakeholders within transdisciplinary studies where a shepherd stated his concerns about the construction of Esenboga Airport in Ankara (entered service in 1950) saying to an engineer he saw on the site, “I sometimes cannot even see my grazing sheep because of the fog; how on Earth dare you build an airport here?”. If the shepherd had influenced the “decision-makers” with his “knowledge based on experience” at that time, this incidence could have served as an example of a simple transdisciplinary feasibility experience today. Using advanced consulting and research techniques to manage very complex issues is associated with **advanced interdisciplinary**.

The issue of sustainable safe administration of mountainous areas in Turkey

that does not serve any direct public policy formation, started to be the area of focus within Dokuz Eylül University in 2013 as a multidisciplinary study. The mountain climbers, forest engineers, geographers have all created a sense of awareness in their own methods of evaluation and over the years, the study has turned into an analysis of interdisciplinary subjects. It was only in 2020 that the study turned into an interdisciplinary study (Karaman et al., 2020). In other words, it is not easy to move quickly from multidisciplinary to interdisciplinarity and beyond on thematic issues that have never been studied before. Participatory administration of mountainous areas creates the potential for a field of study and interest that is of strategic importance for Turkey, and that also requires transdisciplinarity. In addition, although some efforts were seen in the early 2000s, the field of disaster administration still lacks a series of studies that effectively includes health, social sciences and life sciences. Also the literature supports the author.

In a study which has active interdisciplinarity around an issue, depending on the national needs, history, and methods of creating public policies, a country's experts can look for effective solutions by leaning into transdisciplinary studies, especially when there is a chaotic atmosphere or political/administrative and social resistance on local, national and international levels (Karaman, 2021a). Not only the institutional duchies formed over the years, but also the eco-imperialist approaches can make it difficult to solve a problematic area at the local, national and international levels. Problems that can be solved more easily can also develop due to the fact that meteorological measurements cannot be done in a healthy way because of factors such as the growth of trees and buildings. Politicians who interact with groups that block the cutting of trees due to lack of information may interfere with scientific work. However, interdisciplinary cooperation can be seen in the example of a simple joint work of pruning the trees to a level down from the measuring devices. This will allow issues to be solved even before they turn into problems with small or big steps with a corporate/disciplinary cooperation.

Interdisciplinary approaches aim to create information that exceed one single discipline and integrate methodologies of different disciplines. Therefore, the approach needs to begin working by acknowledging the distinction that arises from the interaction between stakeholders and researchers. Therefore, interdisciplinary research includes interdisciplinary reflections and methodologies, but going further, it also questions in a multifaceted manner. Interdisciplinary research is a multifaceted complement to applied research in areas characterized by complexity and uncertainty.

Transdisciplinary research also does not require subjects to be interrelated. This feature manifests itself in the development of a methodology needed for transforming information. Interdisciplinary studies provide energy for transdisciplinary studies. Interdisciplinary studies also call on scientists to help ensure that we can go beyond or cope with the phenomena that have become problems

for humanity in one way or another (Nicolescuian approach), (Bernstein, 2015: p. 6). As you know, cyber ecosystem<sup>3</sup> approach and all interaction networks nourish from the **chaos theory**. Nevertheless, in order for interactions to occur, active participation of stakeholders to transdisciplinary projects and negotiations is crucial. Since there is no unity in the work done alone at one's own desk, this method will most probably condemn the project that requires interdisciplinarity to failure. In interdisciplinary studies, which have the appearance of a superior model of interdisciplinary studies, subject selection is highly important but it is also crucial that not one branch of science ignores the importance of another and none of them acts in a **chauvinist manner**. Another point that should be noted is that lack of intellectual curiosity can prevent working together. **The element of trust** in team members is also an important factor. *In a way, it is foreseen that only with each discipline providing information support for each other and increasing the other's capacity can an interdisciplinary or transdisciplinary study reach its goal.* For success in interdisciplinary studies, team members should be able to prove that not just they had participated in similar work before but also had contributed to the success of that project with their activities. This topic will be further elaborated below.

#### **2.4. Why Is Interdisciplinarity Important and Why Has It Become Prominent in Scientific Studies?**

Interdisciplinary studies may have problems due to ontological and epistemological assumptions. Although interdisciplinary relationships can be structured, it can provide little information about interdisciplinary causality in the analysis of a phenomenon. Therefore, there are three pillars of the actions within interdisciplinary studies such as **accountability, innovation and ontological evidence**.

Interdisciplinary evaluations move together with contemporary developments. Accumulation of knowledge and accountability also affect this evaluation. In this regard, current information, research and technologies, public opinion surveys, public meetings with experts from many areas, awareness meetings, workshops that require sectoral unity with stakeholders all need to be evaluated together.

First of all, it is important to imagine an idea, develop it and understand its feasibility. It is noteworthy that in the creation of this logical framework the concepts of "users", "user needs" and "user interaction" are used. Scientific studies encompass responsibility towards everyone (France & Piller, 2003). In other words, it is necessary to act not only with accountability to the public and consumers, but also with an integrated sectoral sensitivity including all stakeholders. It is seen that a culture of accountability arises from interdisciplinarity. However

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<sup>3</sup>Like natural ecosystems, cyber ecosystem also consists of various participants that interact for numerous purposes all coming from many disciplines and sectors such as private companies, nonprofit organizations, governments, individuals, processes, and cyber devices (computers, software, and communication technologies).



specialization brings more destructive criticism compared to the past. Now society confirms a study's validity to the extent that it creates public benefits. Otherwise, persuasiveness disappears.

### 2.5. Where Is Interdisciplinary Education Amidst These Discussions?

Inclusion of students in the creative process by focusing on specific common points between arts, humanities or social sciences and on science and technology along with accepting that creativeness is a common factor in all valid intellectual efforts is an issue that can be criticized. Rather than studying in a **topic-oriented** manner, students are interested in contemporary social issues which are **problem-oriented**. On the other hand, the classic approach based on sacrificing extensiveness for rigor with the assumption of **knowing a little piece of an entirety of problems well** is the same with knowing a part of a single problem well becomes insufficient as the problems get increasingly complex. Therefore, some academic circles have been polarized. And there has been a strong resistance against change and traditional discipline rules invading scientific studies (Saeger, 1976). Saeger mentions that students and faculty leaders cannot resist the appeal of interdisciplinary programs but they work too little on how to systematically manage them. The concept is confused with "enrichment" and detailed evaluation can only be made if the learning outcomes and processes are clarified.

In addition to the fact that interdisciplinary approach can further improve the area of Information Systems (IS), it has a characteristic that can increase transdisciplinary development. By taking an interdisciplinary approach, researchers can go beyond the boundaries of disciplinary ontology and epistemology to deconstruct complex phenomena (Mepletoft, 2021). Such a high level of synthesis is not possible with interdisciplinary or multidisciplinary approaches. There is a commonality between transdisciplinarity and complexity (chaos). Transdisciplinarity is the answer in deciphering complexity. It is suggested that these studies can improve development prospects. Interdisciplinary questioning will be characterized by a common orientation towards overcoming disciplinary boundaries and an attempt to bring continuity to questioning and knowledge. Other features will include the following: paying attention to comprehensiveness, content, questioning and reference framework of the information; the boundaries between disciplines and concepts becoming intertwined; uncovering the boundaries of disciplines in order to facilitate understanding the research processes and the information gathered as a result thereof; humanist respect for life and human dignity; the desire to actively apply knowledge to improve humans and society.

Transdisciplinarity continues its work today thanks to thinkers brave enough to challenge the traditional perspective based on single disciplines.

There might be opinions that deem transdisciplinary research only appropriate for professional areas outside of academy such as culinary arts and bartending. It is not acceptable to confine interdisciplinary work which is an appropriate

model for the potential creation capacity solely to “culinary arts”. It is known that transdisciplinary studies can be applied to, urban and regional landscape development, effective urban planning, studies enhancing health and welfare, sustainability, social responsibility policies, development of information and communication technologies, web science which works with systematic and holistic thinking.

### 3. The Success of Interdisciplinary Studies

As emphasized by Paul Gibbons (Fuqua et al., 2004) and many researchers, the production of interdisciplinary information emerged as a subject that should be dealt with decisiveness through the questioning of “information society” due to the following main reasons:

- Interdisciplinary research is more creative,
- It allows research that could create applicable results by bringing people of different backgrounds and knowledge/ideas,
- The fact that the chaotic environment created by complex structures can be more easily understood and resolved.

Information society is a concept that can be associated with social capital. It is an important issue highlighted in various studies that a strong social capital based on information, participation and trust increases urban resilience in the face of disasters. It is discussed that evidence in the shape of anecdotes/maxims and some corporate obstacles limit the performance excessively in terms of academic rewarding system. Applicability is undoubtedly an important keyword. Therefore, interest in interdisciplinary research has now expanded to a wide range. Academics and policymakers can be considered as groups that are pre-disposed to work on this type of studies. As interdisciplinary studies developed, brand indicators have emerged.

- The first is the degree of multidisciplinary in a research.
- Secondly, concrete values related to interdisciplinary researchers, such as the number of articles they had written, and etc.

Avoiding reductive assumptions, paying attention to issues such as ethics and social justice issues and how systems affect each other in solving the issue are protective thresholds that help prevent frustration. Selecting a topic which is becoming increasingly prominent with great risk (as in storms and other meteorological events) and where the foreseen interdisciplinary research is needed is very important. It is also crucial to work diligently on researching problem analysis and solution stages by adding questioning methods such as SWOT analysis to the already known classic management processes (PODSCORB).

As a result, the goal is to identify the common problem and a theoretical approach to it. It is important to be able to synthesize problems simply, and to question complex system analyses in these selected problems with a multifaceted approach. The general questions listed below should definitely be asked.

- **How much** is this study supported by stakeholders?

- **How eager** are the stakeholders in supporting this study?
- Is this study **thoroughly understood** by stakeholders?
- **How many new parties** have the current stakeholders of this study have accepted?
- **How realistic** are the parties of this study?
- Did the study/project reach **unchangeable and satisfactory limits**?

This stage-by-stage questioning reveals the need to examine the process management of the acceptability of the study. In other words, in case the topic studied is not well understood or well internalized by the stakeholders, it is going to be hard to find a common solution. Alongside the method defined above, taking into account the life learned lessons and incidents that happened in local areas also increase the efficiency of studies. This fact brings forward the necessity of a higher version of interdisciplinary studies which is transdisciplinary studies.

#### 4. What's Transdisciplinarity Philosophy in These Debates?

Transdisciplinarity has arisen from criticism of the standard information configuration in the disciplines gathered in the curriculum, including moral and ethical concerns. The first studies in the 1970s focused on the problems of epistemology, and on how universities and educational programs should be planned in the future. After a recession, interdisciplinarity reemerged in the 1990s as an urgent issue related to solving new, highly complex, global concerns. Starting with climate change and sustainability, it is spreading to many fields related to science, technology, social problems and politics, education and the arts with increasing rate and diversity (Jurgena, Cēdere, & Keviša, 2018).

Complex phenomena that invite an interdisciplinary approach are sometimes called “complex events”. Such events resist simple solutions and require a broad-based, permanent research effort based on a wide range of topics. Bad issues oblige us to use multiple research to solve the puzzles of sustainability, climate change, social justice, crime, education, health, sanitation, sustainable community development, etc. The information can be converted into new information without the need to change the essence of any of the relevant disciplines participating in the evaluation. Solving the “bad problems” that require creative solutions calls for the participation of stakeholders. In a socio-technical world, it is necessary to rely on socially responsible science. When studying multiple levels and angles of reality at the same time, interdisciplinary work provides an intriguing potential for reviving scientific research both within and outside academia (Bernstein, 2015). It is necessary to utilize the place and importance of theory and observation in scientific contribution.

Revealing the subject relationship of different disciplines with each other and intertwining boundaries in order to evaluate what is happening in the external world in a multifaceted way rather than focusing only on the field itself creates an area that goes beyond the limits for intellectual innovations. It is doubtful whether complexity can be overcome by including interest groups that are close

to the topic and that are assumed (?) distant from the topic. The essence of the matter lies in starting from a topic-based approach and forming the interest factors rather than being problem-oriented (Kroeze, Travica, & Izak, 2019).

Complexity by its nature requires help from various fields. Even for any subject that can be questioned within the social sciences; many other disciplines such as economics, management and politics, as well as sociology and geography are immediately included in the subject. Due to health and the technical breakthroughs of the era, life sciences also enrich this association. According to the cybernetics approach, which constitutes the management and control modeling of complex systems, the necessary diversity, a stable system and a rich list of answers are included in the system inquiry. Studies can be enriched by new conceptual questionings such as in the following example: Is it possible for a single person to do a similar study alone (Leonardo da Vinci) by bringing health, life sciences and social sciences together. So can such a study be considered interdisciplinary? The significant factor here is to increase our capacity as much as possible through consultation, and taking into account different points of view. It is possible to predict most of the time whether a research will be weak just from looking at a person's perception/semantic approach.

Conceptual research is philosophical by nature and is ideal for developing new theoretical or abstract ideas and for reinterpreting existing concepts in the light of developments and conditions brought about by the day.

In the final analysis, there is consensus on the idea that transdisciplinary studies are seen as a reaction against the strict attitude of disciplines based on obeying the rules. In fact, even in interdisciplinary studies, sometimes active interaction cannot take place due to strict rules. Based on the fact that strict rules prevent development, transdisciplinary studies can also be interpreted as a kind of anarchist attitude in the research environment. According to Godemann, "interdisciplinary research refers to problems that the scientific world cannot access individually and that can only be solved through cooperation between scientists and experts. And this kind of research also requires practical experience from outside the academic world" (Godemann, 2006).

## **5. Resilience Cities and Interdisciplinarity**

Due to the influence of global dynamics caused by nature and many other human activities, the cooperation of states is often required. The definition of improved security encompasses various security areas. These areas many subjects such as social, economic, socio-cultural, health, resource depletion, political violence, terrorism (UNDP, 2005).

Natural disasters and events that because severe environmental damage are also studied within the scope of security. Although it is noted that the area of security should not be limited to military purposes, it is also necessary to foresee that science can be instrumentalized largely for military purposes. Combining different disciplines to make research more efficient and profitable has also in-

initiated institutional innovation in this direction. Although scientists came to the stage during world wars and then returned to their academic halls, due to new threats of 21st century, especially cyber-attacks, they can “permanently remain on stage”.

### 5.1. Strengthening Social Resilience

Strengthening strategic infrastructure and superstructure equipment of settlements, providing economic support for increasing social resilience, preparation for civil defense and disaster and emergency administration, creating security intelligence processes for preventing terrorist attacks, detection of espionage, military activities and so on are important administrative measures to ensure national security.

The main theme of Habitat World Summit on healthy cities is to consider land and urban planning and housing-city economy through development together with governance, human rights, the rule of law, and ethic/universal values by evaluating various fundamental services, whether they are e-services or not, in relation with climate change and disaster administration and also by checking the profile of the population. The ability to provide these specified indicators constitutes the information society and urban resilience.

Social resilience is the degree to which a society tolerates change before reorganizing around a new set of structures and processes. The prominent thought about cities is that (Alberti et al., 2003) the ability to find a balance between the urban ecosystem and social activities/functions of the city.

Urban life is related to indicators of quality of life from multiple topics such as poverty, health, migration, cultural transformation, bioengineering of new crops, etc. Therefore, interdisciplinary research is needed. Especially for disadvantaged groups that often cannot make their voices heard, participation in interdisciplinary research can provide an appropriate opportunity to direct their concerns to policy circles. Therefore, attention should be paid to the inclusion of interest groups in the field of research. In the structuring of a logical framework, this attention will allow us to overcome an unbiased information production and to strengthen identity interests based on class, gender and ethnicity. Since different levels of cultural perception on different topics can build different realities because they collect data differently, we can also predict that different “problems” and therefore paradoxes may arise from the same data. However, the knowledge gained by a known reality can also open the doors to another unknown reality.

Universal values of the main approach adopted in public administration organization where democratic administration principles are applied for forming innovative and smart settlements can be listed in three categories: Making decisions in line with public interest, supporting democratic participation processes in the decision-making, and enabling unison of resources and institutions. This administrative process is influenced by multifaceted variables. Efforts to ensure multidisciplinary and institutional cooperation in order to increase social benefit

arose from the need to prevent one country from becoming an administrative colony/dependent of another.

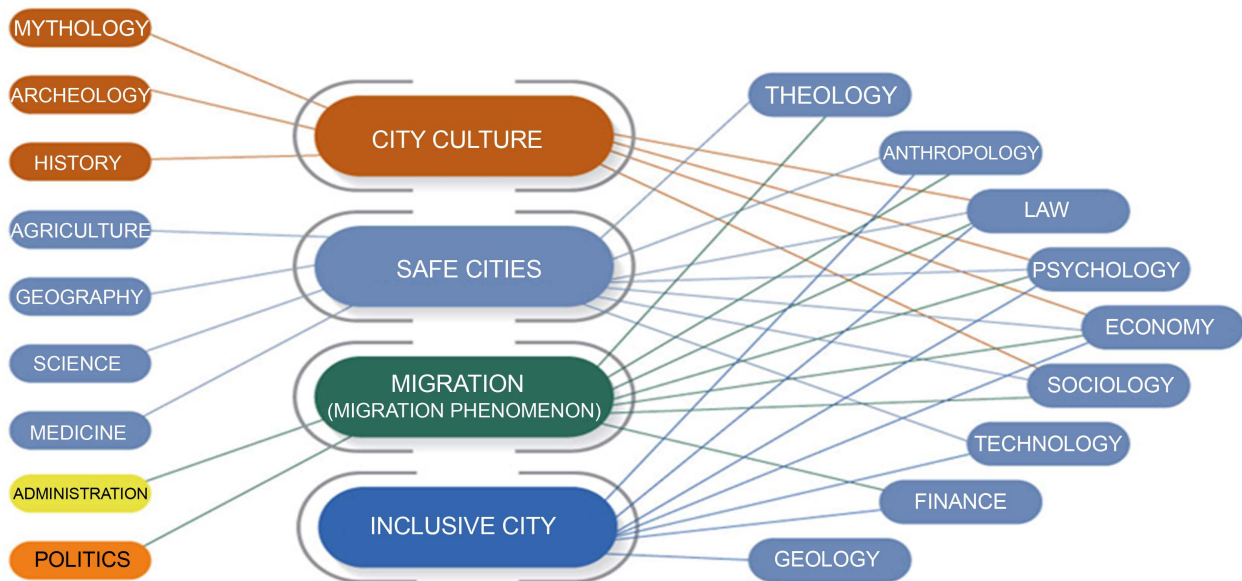
As interdisciplinary and transdisciplinary studies became popular since 2000s, the idea of creating a separate government funding for solving the problems of public administration have arisen (Stock & Burton, 2011). However, “interdisciplinary studies” are not mentioned anywhere in the 11th Development Plan of Turkey. Nonetheless, a separate part was dedicated to the topic of “governance” related to public, private and civil partnerships.

The factors required in the scientific model of a study that needs interdisciplinary cooperation are the following: 1) having scientific equivalents, 2) being able to use the information jointly, 3) the explanations forming the information should be reliable. The relevant groups should **observe** the study and the learning outcomes of the study should be applicable and acceptable by the **decision makers** for **cooperative work**. This issue is analyzed in relation with the safe/resilience cities approach in **Figure 1** and **Figure 2**.

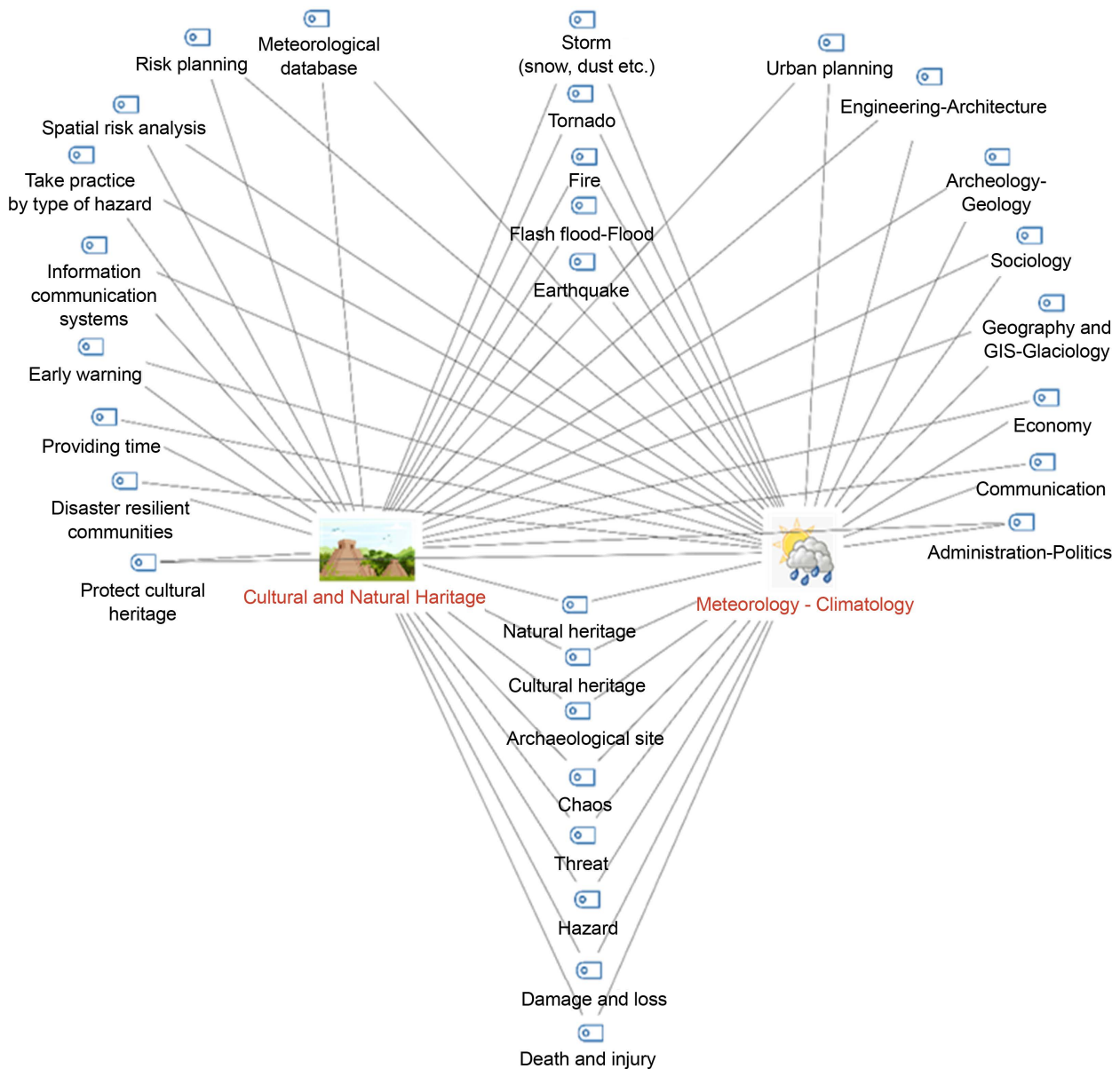
### 5.2. Safe City

Due to the needs of the day, the concept of security is constantly updated. While less than a third of the world’s population lived in cities in the 1950s, it is estimated that over two-thirds will live in urban areas by 2050. This means that due to the multiplying effect of climate change, the pressure of environmental crises and natural disasters on settlements will directly increase. Populated areas will undoubtedly be affected more. Climate changes created a sense of urgency and in a way have positively affected interdisciplinary studies. This issue is analyzed in relation with the safe cities approach.

Economics, sociology, finance, law/criminology, psychology, anthropology, agriculture, medicine, sociology, technology (geology, zoology, biology, meteorology,



**Figure 1.** Urban culture, safe and inclusive cities from an interdisciplinary perspective (designed by author).



**Figure 2.** Cultural heritage - storm and security administration (figure designed by author).

glaciology, virology), geography, administration, politics, theology can all produce useful work by cooperating. However, it is necessary to be prepared for the difficulties mentioned above.

In contemporary societies, interdisciplinary studies are looking for appropriate answers, focusing on increasing theoretical attention. Based on the stated need for interdisciplinary cooperation, a network of relationships regarding themes and disciplines is explained with the help of **Figure 1**.

In terms of quality of urban life indicators, it is necessary to link the ability to fulfill the distribution of goods and services in various conditions or in chaotic environments with the ability to show wisdom using data as an integral part. Therefore, it was considered sufficient to match the topic with the figure.

Here we do not only mention the chaotic natural environments but also the possibility of interest groups disrupting the effective distribution of goods and services within urban administration. The interest of political algorithms at different levels might not complement public interests (Karaman, 2021b). In order to create more social benefits, it is of utmost importance that active interdisciplinary and transdisciplinary studies trigger social awareness around the concept of healthy cities without any hesitation. As you can see from the lines above, international and academic awareness started to emerge in 1970s and became more important with the Rio Environment Summit held in 1992. And since 1994, there is an increasing number of research around the fundamental factors to success and interdisciplinary studies based on a topic are more found to be more successful. This is due to the fact that the "project-based" understanding of interdisciplinarity requires more realistic and concrete knowledge. If the disciplines interact more, new areas and specializations can emerge.

Storms, tornadoes, and floods have begun to prioritize the perception of an earthquake in coastal zones. In provincial areas, floods can happen during heavy rains and storms when sea waves come onshore. In some regions extreme weather events and rainfall are becoming more common. And therefore, authorities are focused on the dual impacts of climate change and urbanization on floods in urban areas. Needless to mention, agriculture is rightly the most important objective in the development of rural areas. One of the most direct ways in which natural disasters such as floods and strong wind affect the agricultural sector is through reduced production. This results in direct economic loss to farmers.

Socio-cultural approaches in risk planning are as important as economic losses. Tornadoes and floods were responsible for the most deaths during 2020 and 2021. Also, a number of reported injuries resulted from tornadoes. In addition, protecting the cultural heritage which is a field of problem that comprises many disciplines such as sociology, economy, administration, politics, geography, archeology, geographic information systems, architecture, urban planning, glaciology and communication network etc. is another factor that is at risk. Floods, for instance, have potential risks of damaging cultural heritage. These are the reasons why urban resilience is an issue of increasing importance to city managers and policymakers (Figure 2).

Interdisciplinary studies are initiated based on the traceability of concrete and real facts and their experiences. It is also important that we are socially aware of what is happening around humans and nature. In connection, the practical conclusions and action plans drawn from the result of the study should be applicable to society. Interdisciplinary studies can create a common framework by processing different themes with different methods. There may also be situations when disciplines do not interfere with each other. A joint research can also be carried out around the same problem using common methods. Methodological development can also be achieved using the philosophy of intertwined know-



ledge.

On the other hand, in transdisciplinary studies the priority is the “theme” rather than the problem. Here it is important to focus on providing an interdisciplinary perspective to the theme rather than focusing on problem-solving. The study then works on a finding and interdisciplinary solution to the problem.

Although a researcher can do an interdisciplinary study on their own, there is a high probability of this study to be weak. It is believed that group work can be more successful in developing ideas due to the possibility and necessity of interaction. Although this single researcher is a highly qualified person who can produce effective studies in numerous fields, there is risk that outcomes of the research can be insufficient and unproductive due to the assessment of issues from a single person’s perspective.

Researchers should integrate information coming from different disciplines. The study can be enriched by creating an interaction between pieces of information and transforming them rather than just putting two different pieces of information next to each other. The combination of theoretical and practical knowledge can facilitate comprehension.

Each project can answer different questions related to their own nature so that multifaceted questioning can occur.

These studies should eventually be opened for academic evaluation. Paying attention to the features below during **final questioning** means to point out the indicators related to the expected efficiency of the study (Wickson, Carew, & Russell, 2006).

- Clear/realistic goals have been set in the research. Important questions related to this area have been identified.
- The research is presented in an understandable way. The efficiency and success of the project have been demonstrated with concrete information.
- Choosing the appropriate method, the researchers determined the most suitable and effective method in line with the goal. The capacity to alter methods taking into account changing conditions can be used. The goal has been achieved. The important results of the information have been revealed.
- The researcher/s achieved the intended goal and made a significant contribution to the field. The new areas that need to be studied are highlighted as new goals.
- The outputs of the research were shared with interest groups through an effective presentation in which suitable communications tools were used (style, forum, media, and etc.).
- The interest groups (stakeholders) with whom the research was shared evaluated the information and brought criticism. And these comments were interpreted again by the researchers/s and the necessary explanations were made. If necessary explanations cannot be made, the study is taken under further evaluation.
- It is thought that the questioning of these studies within the specified network of relations will serve to increase the efficiency/quality of future studies.

When assessed as a whole, has one disciplined influenced the other or not during the study? Has the interdisciplinary partnership been established during developing a new conceptuality while analyzing a subject in depth? These questions should be used to check the process. The following is a list to give an idea of the disciplines which can lead interdisciplinary and transdisciplinary studies for a Safe City (Karaman, 2021c).

Briefly, some countries can be adopting science into popular culture. Other countries may enter into inertia by being influenced by a religious doctrine, regional and national moral values, historical ties. Society's indifference to scientific studies prevents science from entering the public sphere and positively affecting it (Cohen, 1999). However, global communication channels also make scientific mentality visible in terms of its openness to innovations or their opposition.

## 6. Conclusion and Evaluation

According to the assessment of many researchers, it is argued that an interdisciplinary approach to a phenomenon can advance the field of science in order to solve complex phenomena. The combination of interdisciplinary and multidisciplinary approaches is important for a high level of synthesis that goes beyond the boundaries of disciplinary ontology (the science of existence) and epistemology (the science of knowledge).

With the help of interdisciplinary creativity, Social Sciences gives meaning to the terms it receives from different disciplines and permanently enriches its terminology to the same extent that it transforms knowledge. The reason for the creation of this article is that the individual studies of researchers working in multidisciplinary studies focused on science and health in Turkey are carried out within themselves. Therefore, we can state that their predisposition to interdisciplinary research which is the same with many social scientists remains below expectations. According to the author, because of the way they conduct their work, industrial engineers have greater mental tendency towards interdisciplinary studies.

In line with the philosophy generated by the Local Agenda 21 which started in 1992 in Rio and passed onto Turkey in 1996, the partnership of public, private and civil projects has been turned into a "sine qua non" principle supporting institutions and interdisciplinarity and sparing funding. However, the structures in the Local Agenda 21 were "incorrectly" transformed during the city council (5393, Article 76) and they have reversed the improvement in many applications. In addition, the high cost of such studies, which are already difficult to conduct as an academy, also keeps away "voluntary interest" in working on an interdisciplinary study. Therefore, just like in other countries, the Turkish Public Administration will encourage enthusiastic and competent researchers by developing strategies and creating satisfactory budget to support interdisciplinary and transdisciplinary studies.

In fact, healthy and resilient urban structure requires much more awareness than just scientific curiosity since there are complex topics with chaotic features all integrated with risk factors that threaten security, such as the rise in the water levels, external migrations to multiple directions, climate change and disasters. Multifaceted problems trigger each other and turn into dangerous situations that occur suddenly or slowly. Active interdisciplinary and even transdisciplinary work is required to prevent this from happening. It does not seem possible to achieve “interdisciplinarity” or even “transdisciplinarity”, as long as the disciplines continue to form a strong established institutional structure or are not interested in each other. A new national and international consensus is highlighted that brings strong correlation between development, human rights, and national and international security forward with the perspective of a wide network.

Full development both administratively and socially requires a series of decisions ranging from coordination, integration, development of multi-stakeholder participation to paying attention to locally supported work.

The ability to balance the ecosystem and human activities/functions of cities today and in the future requires interdisciplinary efforts for safe cities. It is important that people can combine not only human elements about themselves but also elements of deep ecology concerning the flora and fauna in their living space. And this calls the socio-economic, cultural and political “humane factors” to collaborate within the body of a series of rights and responsibilities, especially in terms of population. Scientific ethical rules are important in this collaboration. Universities act with the fact that the purpose of producing knowledge is to “produce it with rigor”. They do not tolerate some information to be “corrupted” or produced “politically”. Therefore, they highlight scientific questioning by participants as a method at the end of the project. Interdisciplinary and transdisciplinary studies on healthy urban structures are formed on fundamental factors such as including multiple sectors, being inclusive, having original circumstances, and preventing problems with prudence. As a result, these studies become original among academic and ethical inquiries.

Socio-cultural and political stances affect the intellectual development of science. Of course, it is necessary to see that different religious perceptions facilitate the exploitation of other countries under the control of developed countries and in different dimensions, with the hindering effect of socio-cultural and scientific structures on scientific development. Therefore, in trans-interdisciplinary studies, which is an upper version of interdisciplinary studies, it is also important to incorporate lessons learned and local knowledge into the work. In this way, as well as transferring knowledge towards the society, it becomes easier for it to be embraced by the society.

### **Conflicts of Interest**

The author declares no conflicts of interest regarding the publication of this paper.

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