LIVING LABS EXPERIENCES IN TURKEY: EXAMPLES OF BAŞAKŞEHİR AND BODRUM[1]

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ABSTRACT| Living Labs finds the ability to find solutions to problems that arise in cities, to implement original projects and to test existing projects. At the same time, financing, entrepreneurship and design support are provided to the project owners who are entitled to be supported in the life labs. In living labs, a network is organized in which citizens, local, national, international and global companies, non-governmental organizations, local and central governments, think tanks work in cooperation. The main purpose of the study is to provide a conceptual reflection on living labs and to evaluate its role in strengthening governance. Bodrum and Başakşehir Living Labs were chosen as the sample. The aims of the establishment of these two members, the strategic areas they have determined, the projects they have realized or planned, the events and competitions, and the collaborations they have established have been examined.

Keywords: *Living labs, Başakşehir living labs, Bodrum living labs*
JEL Codes: *H83, O18, R0*

Scope: *Political science and public administration*
Type: *Research*

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[1] It has been declared that the relevant study complies with the ethical rules.

TÜRKİYE'NİN YAŞAM LABORATUVARLARI DENEYİMİ: BAŞAKŞEHİR VE BODRUM ÖRNEKLERİ

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ÖZ | Yaşam laboratuvarları, kentlerde ortaya çıkan sorunlara çözüm bulma, özgün projeleri hayata geçirme ve mevcut projeleri test etme becerisine sahiptir. Aynı zamanda yaşam laboratuvarlarında destek almaya hak kazanan proje sahiplerine finansman, girişimcilik ve tasarım desteği sağlanmaktadır. Yaşam laboratuvarında vatandaşlar, yerel, ulusal, uluslararası ve küresel şirketlerin, sivil toplum kuruluşlarının, yerel ve merkezi yönetimlerin, düşünce kuruluşlarının işbirliği içinde çalıştığı bir ağ düzenlenir. Çalışmanın temel amacı, yaşam laboratuvarlarının kavramsal bir yansıma sağlamak ve yönetişimin güçlendirilmesindeki rolünü değerlendirmektir. Bodrum ve Başakşehir Yaşam Laboratuvarları örneklem olarak seçilmiştir. Bu iki aktif üyenin kuruluş amaçları, belirledikleri stratejik alanlar, gerçekleştirdikleri veya planladıkları projeler, etkinlikler ve yarışmalar ile kurdukları işbirlikleri incelenmiştir.

Anahtar Kelimeler: *Yaşam laboratuvarları, Başakşehir yaşam laboratuvarı, Bodrum yaşam laboratuvarı*
JEL Kodları*: H83, O18, R0*

Alan: *Siyaset bilimi ve kamu yönetimi*
Türü: *Araştırma*

1. INTRODUCTION

Innovative solutions in policy making processes and practices in public administration are frequently encountered today. One of these new generation solutions is living labs, which organize trainings, provide consultancy and mentoring support, emphasize working together and produce, provide funds for projects, provide physical infrastructure support for studies and have the ability to test projects. Thanks to the facilitating effect of the services offered by living labs, projects with high economic, and social benefits are implemented.

Although the idea of "living labs" first appeared in literature in the 2000s, its antecedents may be found in earlier times. Participatory design, social experimentation, and digital cities have a long history dating back to the 1970s. In the 1990s, "home labs," headquartered in the USA and centered on simulating a natural setting in the user's laboratory, were a hot topic (Ballon & Schuurman, 2015). The term living labs was coined in the early 2000s. It was defined by William Mitchell as a user-centered research methodology for detecting, prototyping, validating and refining complex solutions in multiple and evolving real-life contexts (Compagnucci, Spigarelli, Coelho, & Duarte, 2021). With the establishment of ENoLL (European Network of Living Labs) organization in 2006, living labs have become popular, especially in the European continent. The aim of Brussels-based ENoLL is to promote the living labs concept to influence European Union policies, develop living labs and ensure their implementation at a global level. More than 440 members have participated in the living labs experience, which started with 20 members in 2006 (ENoLL, 2022a).

As citizen needs change and technology evolves, innovation in the public sector is desperately needed. As public officials and legislators seek to create better public governance systems and tools for tighter control, residents have high expectations of the public services provided (Gascó, 2017). The living labs is accepted as one of these tools. Living labs emphasizes the important role of participation and co-creation by promoting innovation, experimentation, the development and application of knowledge. This concept refers to various local experimental projects of a participatory nature. It is often used interchangeably with the terms “test ground”, “hatchery”, “incubator”, “opening up”, “test bed”, “centre”, “urban laboratory” or “field laboratory” (Steen & van Bueren, 2017). At the same time, living labs is a collaborative research methodology that uses a networked infrastructure to test and validate activities and processes by users and other stakeholders based on real-life contexts (Paskaleva & Cooper, 2021). According to another definition, living labs are described as a living labs where citizens and companies collaborate to solve problems and create services in a city or region. Corresponding to the naturalistic approach that includes creating and

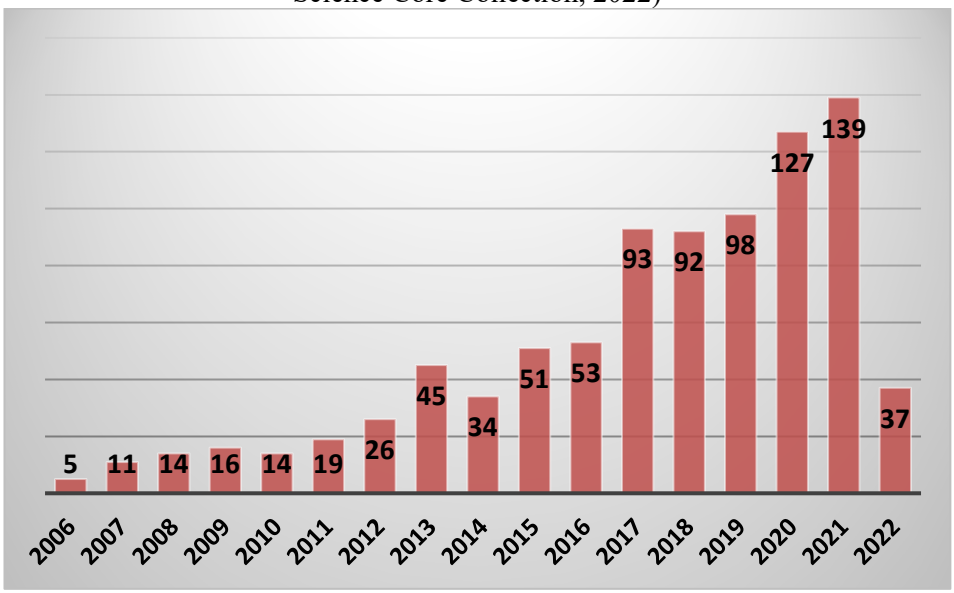
urban experiences with citizens for the purpose of urban problem solving and social innovation, living labs engages various stakeholders in a long-term co-creation process that includes design activities such as concept creation, development and testing (Akasaka & Nakatani, 2021).

2. LIVING LABS FEATURES, ADVANTAGES AND DISADVANTAGES

Living Labs studies have started to attract attention in academia in recent years. A total of 874 academic studies were listed in the "living labs" searches conducted on June 14, 2022 on the Web of Science Core Collection (https://www.webofscience.com/wos/woscc/basic-search). As can be seen very clearly in the table, interest in this field has increased continuously after 2006. The establishment of the ENoLL network was directly effective in the acceleration of the studies.

In order to reveal the "Living Labs" studies in Turkey, a search was made in national scientific journals and in the CoHE Thesis Center. As a result of the scanning, 2 theses were reached in CoHE Thesis Center (https://tez.yok.gov.tr/UlusalTezMerkezi/). One of these theses is at the master's level and the other is at the doctoral level. Both studies were completed in 2020. These results indicate that the level of interest in living labs studies in graduate theses is low. When the national scientific journals were scanned on Dergipark Akademik (https://dergipark.org.tr/tr/) on January 19, 2021, a small number of (4 articles) were produced, similar to postgraduate theses. These articles were published between 2020-2022. It is clearly seen that the subject of living labs was not studied before 2020 in the Turkish academic literature.

Table 1: Distribution of Academic Studies on Living Labs by Years (Web of Science Core Collection, 2022)



Living labs' major objective is to create an effect by creating new products on a small scale and finding solutions that can be adopted on a bigger scale, regardless of the aim being a product, service, technology, application, or system. This is carried out in the actual world and in a collaborative setting where many stakeholders influence the innovation process. Users, private and public entities, and information institutions are the participants in the process. This approach uses user and product assessment input to hasten the development of the product. The product is more likely to be embraced by everyone concerned easily and quickly since it is deployed in a real-life situation and supported by key actors, and it will then swiftly have a significant influence on cities (van Timmeren, 2022).

The living labs strategy adds two things to application-centered design. First off, a living lab is a temporary location with unique regulations that moves the experimentation stage into a real-world setting after the design phase. Thus, routine behaviors are temporarily disturbed, which encourages people to adopt new behavioral patterns. Secondly, living labs are a process: cooperation between residents, research teams, implementation partners, and other stakeholders is prioritized towards collaborative and social learning rather than reaching a particular conclusion (Sahakian, Rau, Grealis, Godin, Wallenborn, Backhaus, ...

& Fahy, 2021).

According to Schuurman, De Marez, & Ballon (2013), living labs has five descriptive elements in Figure 1. These elements are; active user engagement, real-life environment, multi-stakeholder engagement, multi-method approach and co-creation. In the living labs, a pragmatic approach of ICT technologies to innovation is represented, characterized by the real-life environment the innovation process takes place and the active participation of users. There is multi-stakeholder involvement, which brings an open innovation perspective to living labs and is defined over its four roles: user, beneficiary, enabler and provider. In a multi-stakeholder structure, actors are considered active co-producers, not passive participants. Living labs are likewise a multi-methodological approach with various research techniques aimed at accessing the ideas and knowledge of these users. This strategy involves conducting medium- and long-term research. Finally, the infrastructure and multi-stakeholder structure strengthened by information and communication technologies facilitate co-creation.

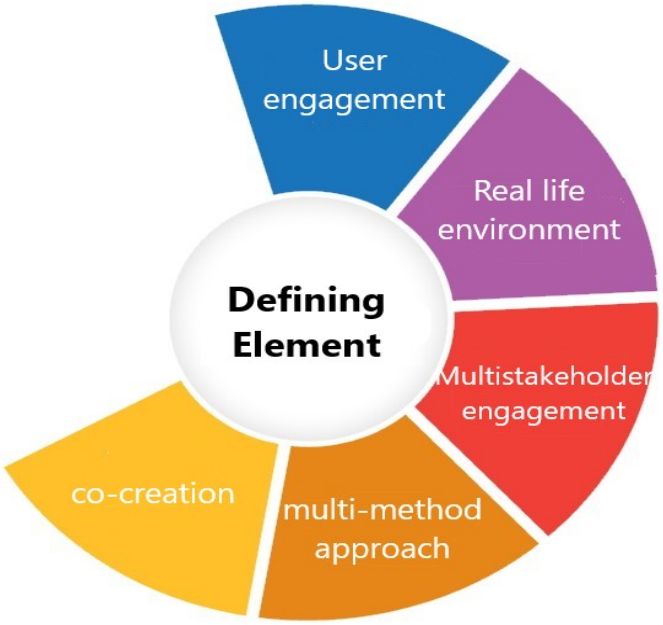


Figure 1: Descriptive Elements of Living Labs
References: (Schuurman, De Marez, & Ballon, 2013).

Technology can turn into a beneficial phenomenon only when it meets with experience and knowledge. What is important here is the use of technology in a way that will respond to the problems and needs encountered. Providing the necessary data for public policy production and enabling experimental policy making by testing the application directly in the laboratory are among the important advantages. Living labs is a platform that contributes to the emergence of innovations by participating in the created environment, users and other stakeholders (Babaoğlu, & Memiş, 2019). Living labs has been practiced in different areas. These fields are presented below as a table (see table 2).

Table 2: Application Areas of Living Labs

Areas	**Authors**
e-learning	Antonova, & Todorova, 2011
e- participation	Cleland, Mulvenna, Galbraith, Wallace, & Martin, 2012
involvement	Savelkoul, & Peutz, 2017
urban regeneration	Trapani, 2016
pervasive healthcare research	Favela, Kaye, Skubic, Rantz, & Tentori, 2015
open-innovation networks	Leminen, Nyström, & Westerlund, 2020; Dias, & Salmelin, 2018; Mirijamdotter, Ståhlbröst, Sällström, Niitamo, & Kulkki, 2006
environmental monitoring	Quarto, Di Lecce, Giove, Soldo, & Di Lecce, 2014
interactive value production	Hronszky, & Kovács, 2013
urban logistics	Quak, Lindholm, Tavasszy, & Browne,2016
sustainability	Bulkeley, Coenen, Frantzeskaki, Hartmann, Kronsell, Mai, ... & Palgan, 2016; Compagnucci et al., 2021; Puerari, De Koning, Von Wirth, Karré, Mulder, & Loorbach, 2018
economic development	Bilandzic, Foth, & Hearn, 2019
wearable computing	Boronowsky, Herzog, Knackfuss, & Lawo, 2006
universities	Wehrmann, & van der Sanden, 2017
designing assistive technologies	Pigot, & Giroux, 2015

Living labs shows how it expands the available space for experimentation and innovation, enhances the techniques employed, and offers tools to help think through and identify the many effects of public sector innovation. By putting a far larger focus on the many kinds of co-creation of innovation, particularly with the direct or indirect engagement of users and other stakeholders in experiential forms of innovation, living labs is upsetting traditional ways of public invention. In the public sector, living labs provide settings or locations that foster new forms of learning, experimentation, and innovation (Fuglsang, Hansen, Mergel, & Røhnebæk, 2021).

The living labs strategy gives cities access to relatively affordable sources of creative ideas while also engaging residents and communities and

fostering social innovation. In fact, governments may help residents, communities, and private groups to develop creative solutions that are centered on the needs of the city and provide a bypass for the traditional public procurement process, which is frequently more onerous and expensive (Tanda & De Marco, 2021).

In addition to its many advantages, living labs is available in cases where it is disadvantageous. Overall, living labs have enormous promise for investigating participatory processes made possible by cutting-edge technology in practical settings. The potential is, however, fundamentally susceptible because of the inherent difficulties that come with testing in these real-world settings, such as usability problems and political hesitancy regarding change. Emerging technological issues like usability problems might provide unanticipated difficulties (Åström, Ruoppila, Ertiö, Karlsson, & Thiel, 2015).

Living labs also demonstrates the significance of intimate collaboration between participants in laboratories in order to speed invention activities. In doing so, stakeholders bring heterogeneous resources and information into joint activities, and there may be a conflict of opinion between stakeholders and between context and stakeholders (Hossain, Leminen, & Westerlund, 2019).

3. METHODOLOGY

In the study, the information about Başakşehir and Bodrum Living Labs, which are active members of ENoLL, is planned to be obtained from secondary sources, to be scanned within the framework of an exploratory research and to make general evaluations based on these sources. A case study research approach is adopted to examine current projects on living labs, clarify the roles of stakeholders and gain insights to ensure their effective participation in the co-creation process.

Case studies are a research design used in many areas such as evaluation processes, in which the researcher analyzes a situation, often a program, event, action, process or one or more individuals (Creswell & Creswell, 2017). In the case study, a current phenomenon is studied by adopting it within the framework of its real life, where the boundaries between the phenomenon and its environment are not clear. In case study, there are situations where there is more than one data source. If a research design is intended to collect information with a case study, that research, with its flexible and interactive aspect, deals with new dimensions that will develop in the field or within the research design within its information collection framework. This also makes it easier for the research design to adapt quickly when an unexpected result is encountered in the research (Baydar, Gül, & Akçil, 2009).

Multiple case studies allow the researcher to explore differences within and between cases. The purpose of this method is to replicate findings across cases. Used to investigate situations where the intervention being evaluated does not have a clear, single outcome set. Careful selection of cases is imperative as comparisons will be made so that the researcher can predict similar outcomes across cases or predict opposite outcomes based on a theory (Yin, 2003). Exploratory research design is the situation of trying to discover the general nature or insight of a problem, possible decision alternatives and variables related to the subject (Toksarı, Mürütsoy, & Bayraktar, 2014).

The study delves into the concept of laboratories by analyzing two case studies. It is limited to Başakşehir and Bodrum Living Labs, which have active memberships in the EnoLL network in Turkey. It aims to answer the following three research questions to clarify the outlines of the study, considering its economic, environmental and social context. These questions are as follows:

1. How does the living labs function as a policy-making tool?
2. What are the prominent features of living labs in Turkey?
3. At what point do living labs in Turkey converge and diverge?

4. TURKEY'S LIVING LABS EXPERIENCE

In this part of the study, Başakşehir and Bodrum Living Labs, which are current members of the ENoLL network in Turkey, are discussed from different perspectives. Turkey's living labs experience has been evaluated on the basis of the establishment objectives of these two members, the projects they have implemented and supported, the stakeholder relations they have established, and the activities they have carried out.

Living labs is accelerating the transition to the smart city. By involving stakeholders in the process, it facilitates the stakeholders' in-depth understanding of how to implement a new product or service and how it relates to their own lives. With the data obtained, the speed of finding solutions to the challenges of stakeholder participation in creating urban development strategies and smart city governance and the quality of service development will increase. Projects created in the smart city process in Turkey have a multi-stakeholder structure. These projects aim to combine the sustainability of resources with innovation. Using the living labs approach to achieve this goal will prevent the emergence of inefficient projects (Karlı, & Açıksöz, 2021).

Municipalities in Turkey can provide living labs with sufficient resources and innovative city projects that increase the quality of life by taking into account the collection, analysis and sharing of data. Living labs, whose focus is on smart urbanism, information technologies and sensor technologies, will especially

collect data and share this data with everyone for the production of projects, which will encourage product and service innovation and contribute to urban life. At this point, official institutions are required to provide the necessary procedural environment for data transfer by sharing their data with living labs and for living labs to collect data (Arslan, 2022).

Başakşehir Municipality, located within the borders of Istanbul province, was established in 2008. The Başakşehir District's economic structure heavily relies on the industrial sector. Ikitelli Organized Industrial Zone, which was established on an area of 700 hectares in the north of the TEM highway, enabled the industrial sector to take place in the district with a large mass. In addition, there are various industrial facilities operating on a parcel scale in Kayabaşı Locality, which is within the borders of Başakşehir District. Commercial areas, administration centers, training facility areas, etc. high-density residential areas, where other reinforcement areas are dense, are surrounded (Başakşehir Municipality, 2022). According to TURKSTAT data, the population of Başakşehir district is 503.243 (TURKSTAT, 2021).

The location map of the areas determined as the study area in Turkey is given in Figure 2. Başakşehir Livings Labs is located in the northwest of Turkey, while Bodrum Livings Labs is located in the southwest.

Figure 2: Location of Living Labs

It is understood that Başakşehir, which is a new settlement area compared to other districts of Istanbul, has led the founding mayor to seek different methods due to the new settlement area. Within the scope of the efforts made in this context, Başakşehir Living Labs was established in 2011 under the leadership of Başakşehir Municipality and started active activities in 2014. Although there are

problematic areas in various aspects, Başakşehir Living Labs is an important example of living labs in Turkey. Along with other living labs, it is noteworthy to examine the practice of Başakşehir Living Labs, considering all its positive and negative aspects. From this point of view, the emergence of similar formations in other cities will make important contributions. It is pointed out that the participation of citizens and other parties through these platforms will lead to the weakening of the monopoly position of companies in business relations with the municipality in the process of public innovation development (Memiş, & Bayraktar, 2020).

Image 1: Image of Başakşehir District
References: (savasmoving.com, 2022)

The world-famous Bodrum Peninsula; 3,500 years of history, culture and art inherited from ancient civilizations, natural beauties, original architecture, agricultural riches, gastronomy, climate, sea and magnificent bays, entertainment life that lasts until the morning, quality and different concept accommodation facilities that meet all kinds of needs of visitors. It is one of the corners of paradise in Turkey. Since 1965, with the development of tourism, population growth and construction started to make Bodrum a rapidly developing tourism center (Bodrum Municipality, 2022). The current population of Bodrum is 187.284 (TURKSTAT, 2021).

Image 2: Image of Bodrum District
References: (BOTAV, 2022)

Başakşehir Living Labs (Smart City Istanbul Living Lab, BLL) is a full member of ENoLL network. Full members have the privilege of voting and being a candidate in the general assembly, as well as the right to participate in all the organizations, thematic and working groups. Established in 2013, Turkey's first living labs Başakşehir Living Labs is also the 6th wave member of the ENoLL network. Bodrum Living Labs has the status of adherent members of ENoLL. Adherent members are included in ENoLL communication channels and have the right to participate in activities, thematic and working groups. adherent members do not have the right to vote in the general assembly. After being an adherent member for three years, they can apply for full membership (EnoLL, 2022b).

The aim of Başakşehir Living Labs is to create an environment where information technologies and design-related products and services can be tested and developed with real users in a real life environment (Başakşehir Living Labs, 2022a). Bodrum Living Labs, on the other hand, started its activities in order to create economic and social value for our stakeholders by providing an environment and coordination for the development, prototyping, user testing and implementation of innovative products and services that create value in agriculture, tourism, welfare, health and agriculture (Bodrum Living Labs, 2022d).

In Başakşehir Living Labs, effective speech and presentation preparation for different age groups, learning different programming languages including

HTML, CSS, BOOTSTRAP, PHP, MATLAB, JAVASCRIPT, C#, 3DS Max, unmanned aerial vehicles, robotics, 3D printing, numerous trainings were held in the fields of entrepreneurship and technologies such as data mining, artificial intelligence, machine learning, and deep learning. In addition to the trainings, BLL organizes Hackathon at least twice a year in order to obtain value-added results with the studies lasting a few days with the participation of the relevant people in order to generate ideas and projects on the determined subjects, and also provides an environment for other institutions to organize. To those who have an innovative project in Turkey with entrepreneurship days; professional managers, industrialists, mentors, investors, public administrators and other players of the entrepreneurship ecosystem are provided with the opportunity to promote their projects and develop their networks. Anyone with a project can apply to this event, which we have been organizing twice a year since 2015. All of these trainings and activities are offered free of charge (Başakşehir Living Labs, 2022b).

Bodrum Living Labs has not held any events so far. It is thought that the fact that he is a new member of the community (in 2020) is effective in not being able to organize an event. In addition, due to the Covid-19 pandemic, restrictions on curfews, intercity travel and meetings are likely to be decisive (Bodrum Living Labs, 2022a).

To entrepreneurs in Başakşehir; free entrepreneurship, consultancy, mentoring and design support from Istanbul Design Factory (IDF). Spatially; incubation center, electronics laboratory, 3D printer laboratory, meeting rooms, opening a stand, product and service exhibition in the field of showrooms are contributed. In addition to these supports, entrepreneurs have the opportunity to cooperate within the ecosystem by participating in entrepreneurship days, to test the developed products and services in the real environment, and to share news in BLL and ENoLL bulletins (Başaksehir Living Labs, 2022c).

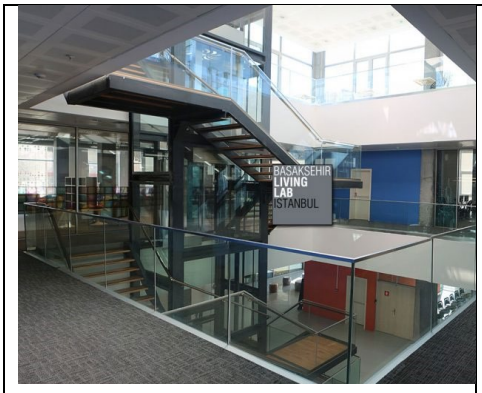


Image 2: Başakşehir Living Labs Working Space
References: (thinkwithturkiye.com, 2018)

Image 3: Bodrum Living Labs Working Space
References: (Bodrum Living Labs, 2022b)

There is a multi-stakeholder structure in the study carried out in Bodrum and Başakşehir Living Labs. Of these two living labs, Başakşehir was an initiative of Başakşehir Municipality, while Bodrum was established within the body of Bodrum Entrepreneurship Inc. (Helo! Bodrum). Research and development centers, non-governmental organizations, IT companies, voluntary organizations, national and international organizations are included in the network. Angel Effect and Mentor Effect companies provide entrepreneurship support for new generation investments to both Başakşehir and Bodrum Living Labs. Although there is a cooperation at the high school level in Başakşehir Living Labs, a partnership is made with Muğla Sıtkı Koçman University and Bahçeşehir University regarding research and development in Bodrum Living Labs. In both living labs, cooperation has been made with the district municipalities within their borders. Both living labs are in partnership with each other in terms of project partnership, exchange of ideas and announcement of events. In the context of partnership with non-profit organizations, Başakşehir cooperates with the Çöpüne Sahip Çık Foundation and Habitat Association. Bodrum, on the other hand, is actively working with the Bilişim Teknolojileri ve Bilişimciler Association. The detailed list of the institutions and organizations that the living labs stakeholder with is presented in Table 3.

Table 3: Stakeholders of Living Labs[2]

Bodrum Living Labs		Başaksehir Living Labs	
Stakeholder	**Collaborations**	**Stakeholder**	**Collaborations**
Bodrum Chamber of Commerce	Communication with the private sector and providing a test bed	**Istanbul Design Factory**	Graphic design
Bodrum Municipality	Produce projects and education.	**Başakşehir Municipality**	Produce projects and education.
Bilişim Teknolojileri ve Bilişimciler Association	Informatics education	**Idea to Business**	Supporting entrepreneurs
Shellix	Digital transformation	**Radore**	Data security
Bahçeşehir University	Academic collaboration	**Bahçeşehir University**	Academic collaboration
TheLifeCo	Digital health application	**İkitelli Organized Industrial Zone**	Establishing an entrepreneurial ecosystem
Start-in Bodrum	Innovative solutions to problems in the field of tourism	**Çöpüne Sahip Çık Foundation**	Social responsibility project
Starters hub	Provide technology investment funds	**HABITAT**	Social capacity building projects
Mentor effect	Strengthening the entrepreneurship ecosystem	**Mentor effect**	Strengthening the entrepreneurship ecosystem
Helo! bodrum	Creating an entrepreneurial ecosystem	**TTNET**	Internet infrastructure
Angel effect	Set up an angel investor network	**Angel effect**	Set up an angel investor network
Gedik Yatırım	Provide financial services	**Startupbootcamp**	Supporting early-stage tech companies
Başakşehir Living Labs	Mutual cooperation	**Bodrum Living Labs**	Mutual cooperation

Başaksehir Living Labs; financing, design, entrepreneurship, mentoring and venue support were provided to many projects including outdoor advertising, alternative energy sources, virtual trading platform, security, education, real estate, mobile games and stray animals. Some of these projects are (Başaksehir Living Labs, 2022d):

[2] It has been compiled from the information obtained from the official websites of Başakşehir and Bodrum Living Labs.

• Petty: It is a mobile application and social media platform that informs the stray animals' needs (nutrition, shelter, disappearance, adoption and health needs) to the sensitive people around.

• Swam Intelligent Lighting Systems: It is a system that provides optimum lighting with high energy savings in lighting and provides the opportunity to plan in lighting by recording all data.

• Linsmart: It is an electronic identity and passport reading and verification system.

In Bodrum, projects were realized and planned by Bodrum Girişimcilik Inc. in cooperation with different stakeholders. These projects are (Bodrum Living Labs, 2022c):

• Wannawell: A mobile application that offers a holistic health approach, transformation programs and expert support.

• Mystic: The ultimate brain frequency changer, subliminal programmer and super learning platform.

At the point of strategic area determination, the two living labs are completely different. Bodrum Living Labs has been determined as a strategic area for new generation maritime, smart agriculture, four seasons tourism and healthy living, taking into account geographical location and prominent sectors (Bodrum Living Labs, 2022d). On the other hand, Başakşehir Living Labs selected areas to strengthen the technology infrastructure and increase the level of digital literacy. These include smart cities, smart life, wearable technology, robotics, wireless communication, design, mobile health, smart education, information technology training, and renewable and smart energy systems. They also include mobile applications, robotics, wireless communication, wearable technologies, information technologies, and software (Başaksehir Living Labs, 2022e).

5. CONCLUSIONS

Living labs, which contributes to sustainable urbanization due to its features such as encouraging collaboration, providing financial support, and providing a test environment, draw on technology and expertise to generate creative thinking that integrates research, management and people. This creative idea fosters communication between decision makers and stakeholders, while revealing a common vision of development and innovation at the local level.

In the case of Turkey, how and to what extent livings labs projects are developed and implemented, as well as how they are established and presented holistically have not been sufficiently researched. In addition, in the studies carried out so far, evaluations on a single sample have been preferred. In order to close this knowledge gap in the literature and to examine living lab applications,

Başakşehir and Bodrum examples were chosen.

The LiverRUR project aims to implement the living lab research/development approach for rural areas in selected pilot areas in eleven countries (Portugal, Czech Republic, Slovenia, Spain, Malta, Turkey, Italy, Latvia, Austria, France and Tunisia) (Zavratnik, Superina, & Stojmenova, 2019). Although Turkey is one of the countries selected as a pilot region in the LiverRUR project, it has not implemented any projects.

Bodrum Living Labs carries out the projects planned within itself. Başakşehir Living Labs, on the other hand, is supported by the successful projects in the project competition. Until now, many original works such as outdoor advertising, alternative energy sources, education, authentication systems, street animals, real estate marketing, mobile games have been commercialized. Başakşehir Living Labs has organized various activities in order to increase the digital literacy level and technology awareness of children and young people.

Başakşehir and Bodrum districts are economically separated from each other. Industry plays a dominant role in Başakşehir's economy. In Bodrum, the tourism sector is the leading sector of the district. The economic structure and the strategic areas determined by living labs directly overlap. While steps are taken to strengthen the technology infrastructure in Başakşehir, studies focusing on healthy life, smart agriculture, new generation maritime and all-season tourism are carried out in Bodrum.

In the existing living labs organizations in Turkey, while opening the way for low-budget initiatives, involving citizens and communities in innovation processes, and focusing on social problems, there has been no study on the feature of being a test bed. Studies on innovative technologies such as artificial intelligence, electric vehicle, robotics, internet of things, mobile applications, 4D printing and gamification, which are seen as the technologies of the future, should be designed and studies should be carried out to test these projects.

In Başakşehir and Bodrum Living Labs, extensive partnerships have been established with industrial organizations, universities, entrepreneurship and technology companies, professional chambers and non-governmental organizations. Thus, early stage entrepreneurs were supported financially and technically, social responsibility projects were realized, mobile applications for healthy living were developed, activities were carried out to increase the digital literacy level of citizens, and the technology infrastructure was strengthened. In addition, all the studies carried out set an example for other municipalities.

Living labs has many benefits such as development and job creation, awareness of innovation in society, multi-stakeholder product and service development process addressing a real opportunity and threat thanks to the spiral

network, and real-world testing and validation of products and services. In order for living labs in Turkey to be noticed more by the local people who are part of the quadruple helix network, it is necessary to increase public and private sector collaborations, and to accelerate the public relations activities necessary for media visibility (Bekmezci, 2022).

In conclusion, living labs is an area for public administrators to consider, given its contribution to empowering active participation, fostering innovation, and facilitating collaboration. The number of living labs in Turkey needs to be increased. In addition to increasing the number, it is also beneficial to become qualified. In this context, the study is expected to be a guide for municipalities in Turkey.

6. CONFLICT OF INTEREST STATEMENT

The author of the article has no conflict of interest with any institution or person (Single Author).

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8. AUTHOR CONTRIBUTIONS

AK: Idea;
AK: Design;
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9. ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

Ethics committee approval was not required for the study.

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