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A Comparison of Innovation Strategies of Regional Development Agencies in Turkey

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Abstract. This paper aims to assess the regional innovation system of Turkey by comparing regional innovation strategies developed by regional development agencies. Focusing on the specific regional innovation strategy documents and addressing first, reports, researches and publications on the official websites of the agencies, and next, the in-depth interviews conducted with the representatives of regional development agencies by phone and/or e-mail, the paper examines and comparatively evaluates the efforts of the regional development agencies contributing to the regional innovation system. Comparative evaluation reveals that some regional development agencies have created a specific regional innovation strategy whereas the others have not yet developed such strategies, but conduct various studies on different innovation dimensions, although these studies are exclusive and far from a holistic approach. The comparative evaluation also reveals that regional innovation strategies differ in terms of regional priorities.

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Nevertheless, similar strategies developed by regional development agencies address the following issues: developing the research and innovation culture; research and innovation infrastructure; institutional structure; human resources; financial resources; effective communication, cooperation and coordination; entrepreneurship and innovation ecosystem; awareness of innovation activities; clusters; priority sectors; social innovation; intellectual property rights and commercialization. Although there are some efforts to improve the regional innovation systems by regional development agencies, the comparative evaluation demonstrates that they have not yet reached the desired level of producing a holistic regional innovation strategy and they should be more effective as a key actor in the regional innovation systems.

Key words: regional innovation system, regional development agencies, regional innovation strategies, Turkey.

Introduction

Innovation is increasingly regarded as one of the key engines for economic growth and prosperity. In a knowledge-based economy, economic performance depends on competition as a driver of improved productivity, and innovation as new technologies, techniques and ways of working that drive improved productivity. Innovation is increasingly acknowledged as an important driver of value creation, economic growth and social welfare, while innovation performance is an important criterion for improving international competitive power (Özen, Baycan, 2014).

The production of goods and services is becoming more and more knowledge/science/technology and skills-intensive[1]. As a reflection of this knowledge/science/technology/skills-intensive global competitive structure, challenges on innovation make the innovation systems, policies and strategies diversified both in national and regional levels. In this context, there are different responses and reactions of different countries and regions to this competitive environment.

Every structure from micro to macro scale (firm, region, nation etc.) strives in this competitive environment in such a way that some try to create changes by pioneering, while others try to recognize, follow and adapt these changes. Globalization increases the need for innovation policy, and also affects the design and implementation of innovation policies (Edquist, 2008); every society strives for innovation that corresponds to its needs and capabilities[2].

Due to the production, development, diffusion, application and use of technology and knowledge, innovation systems have become the focus of interest not only for academics but also for decision makers at the national and regional level in terms of economic development and social welfare.

Since the innovation system is a tool for economic and social development, countries and regions create policies, strategies and plans for the establishment and management of effective innovation systems (Özen, Baycan, 2015). "Innovation systems" is an interactive and integrated process which is composed of the network and relationships of various creators/actors (institutions in the public and private sectors such as firms, universities, government agencies, technical agencies and R&D public infrastructure etc) (Özen, Baycan, 2015). The relations between various actors are very important for the function and change of innovation systems (Edquist, Johnson, 2000, p. 60).

[1] Managing National Innovation Systems. P. 15. Available at: http: //dx.doi.org/10.1787/9789264189416-en

[2] Innovation Policy: A Guide for Developing Countries. P. 7. DOI: 10.1596/978-0-8213-8269-1. Available at: http://documents1.worldbank.org/curated/en/251181468340760891/pdf/548930PUB0EPI11C10Disclosed061312010.pdf

Improving the coordination mechanisms (Pellegrin et al., 2010, p. 16) and the flows of knowledge[3], technology and information[4] among these various actors strengthen innovation processes by promoting systematic and qualified interactions (Pellegrin et al., 2010, p. 16) and dynamic networks (Feinson, 2003, p. 19) between them.

Regional innovation systems are complex and interactive networks not only in national but also in global ties and connections via international agencies and innovation systems. Within these systems, regions not only have innovation performances at different levels, but also make progress in different ways depending on factors like their positions in the system and changes in national policies.

Despite the free movement of capital and labor as a result of globalization, the importance of regions is increasing as a process of knowledge production, use and "accumulation of knowledge remains locally embedded and spatially concentrated"[5]. The regional innovation system approach helps to explain the regional dimension of production and the regional disparities of innovation capacity and economic power (Schrempf et al., 2013), and highlights the diversity of regions in the countries, the differing dynamics of innovation and the interactions between organizations in a particular system[6]. The analysis of a regional innovation system allows creating and disseminating economically relevant information in a certain region, and also identifying key actors and resources (such as existing infrastructures, sources of information and resources of expertise, financing, etc.). A system concept helps to clarify what kind of support is established and what inter-regional cooperation opportunities are at which policy level (local, regional, national, transnational)[7]. The regional innovation systems concept is composed of different types of actors (big or small, local or multinational firms, universities, public research facilities, technology centers and cluster associations etc.) and the linkages and relationships between these actors[8] (Edquist, 2005; Asheim et al., 2013; zen et al, 2018). Regional innovation systems have recently been of great importance. The OECD[9] explains why regions occupy an increasing role in regional innovation policies and why they are key actors in forming and shaping virtuous innovation trajectories, and mobilising untapped potential for national growth. Especially when they have set up the necessary administrative mechanisms to support clusters and innovative enterprises, regions represent economically more meaningful communities, and can easily define the flow of real economic activities and make use of the synergy and connections between economic actors (Cooke et al., 2000; Cook, Memedovic, 2003). The emergence of clusters as a local innovation system and the emphasis on competition superiority are related to the presence of regional and local innovation systems. Hence, it shows that regional innovation systems form the basis for national competitive advantage (McCall, 2010).

With having local dynamics and knowledge, regional level is important for economic development and for the design and implementation of innovation policies and strategies. Therefore

[3] National Innovation Systems. P. 3. Available at: http://www.oecd.org/science/inno/2101733.pdf (accessed: August 19, 2014).

[4] National Innovation Systems. P. 7. Available at: http://www.oecd.org/science/inno/2101733.pdf (accessed: August 19, 2014).

[5] Regional Innovation Scoreboard. P. 74. Available at: https://data.europa.eu/doi/10.2769/88893

[6] Regions and Innovation Policy. OECD Reviews of Regional Innovation. OECD Publishing, 2011.

[7] Innovating Regions in Europe (IRE) Secretariat. Final Report. ERIS Working Group, 2008.

[8] Regions and Innovation Policy. OECD Reviews of Regional Innovation, OECD Publishing; European Commission, Directorate-General for Enterprise and Industry. Regional Innovation Scoreboard 2014. P. 74. Available at: https://data.europa.eu/doi/10.2769/88893

[9] Regions and Innovation Policy. OECD Reviews of Regional Innovation. OECD Publishing, 2011.

institutional structure at regional level gains importance. Thanks to regional dynamics, interactions, networks, flows and linkages, regional development agencies (RDAs) are effective regional actors in regional planning and regional innovation systems.

Since regional innovation strategy projects were launched by the European Union (EU) in 1994, the strategies on innovation systems are recognized as a key issue in capacity and performances of regional innovation systems. In order to implement and manage an effective innovation system, the regional innovation strategy is an important tool for regional stakeholders within a framework of a common platform to define the strategic objectives and the sequence of activities of the R&D and innovation of the region to reach the goals over the long term (Zabala-Iturriagagoitia et al, 2008; Lewandowska, 2012).

Aim and structure of the research

This paper aims to assess the regional innovation system of Turkey by making a comparison of regional innovation strategies developed by RDAs. For this assessment, in-depth interviews with the representatives (heads of departments and specialists) from the RDAs were carried out by phone and/or e-mail to determine how RDAs approach innovation. In these in-depth interviews, the representatives were asked whether they have regional innovation strategies, financial support programs or any other initiatives in this regard. Therefore the data and information were collected from in-depth interviews with the representatives in addition to the official websites of the RDAs including regional plans, work programs, action plans, support programs, reports, publications of strategies and researches as thematic and sector analyses. On the basis of collected data and information, regional innovation strategies or the inititatives of the RDAs were compared and assessed.

The importance of regional innovation systems, regional innovation policies and the RDAs are described briefly in the introduction. In this section, the research aim and structure of the study are explained. The third section focuses on the historical development process of regional innovation systems and RDAs in Turkey, presents the structure of the regions at NUTS-2 level and makes an assessment on evolution of RDAs and policies over time. In order to assess Turkey's regional innovation system, final section focuses on the examination, interpretation and a comparison of regional innovation strategies of the RDAs and the challenges they have faced.

Regional innovation systems in Turkey

Regional development policies in Turkey have been restructured and transformed with the declaration of Turkey as an official candidate in the EU at the 1999 Helsinki Summit, and have become a hot topic with a totally new perspective to provide a cohesion to the EU policies. In line with this cohesion process, as a beginning step, Turkey accepted the Nomenclature of Territorial Units for Statistics (NUTS) classification and defined its new regions as compatible to NUTS in 2002[10] and decided to establish development agencies (DAs)[11]. As a result, today Turkey has 26 RDAs, respectively 2 RDAs (İzmir and Çukurova) in 2007[12],

[10] Decree of the Council of Ministers 4720 "Decision regarding the definition of the classification of territorial units for the collection and development of regional statistics, making socio-economic analysis of regions, determining the framework of regional policies and creating a comparable statistical database in accordance with the european union regional statistics system", dated September 28, 2002. Available at: https://www.resmigazete.gov.tr/eskiler/2002/09/20020922.htm (in Turkish).

[11] Law on the establishment, coordination and duties of development agencies 5449, dated January 25, 2006. In: *The Official Gazette of Turkey, 45, 26074, dated February 8. Available at: http://www.mevzuat.gov.tr/MevzuatMetin/1.5.5449.pdf* (in Turkish).

[12] Decree of the Council of Ministers 10550 "Decision on establishment of development agencies in some level 2 regions", dated May 31, 2006. Available at: https://www.resmigazete.gov.tr/eskiler/2006/07/20060706-1.htm (in Turkish).

8 RDAs (İstanbul, Konya, Samsun, Erzurum, Van, Gaziantep, Diyarbakır and Mardin) in 2008[13] and finally 16 remaining RDAs in 2009[14]. Therefore, the development of RDAs[15] can be mentioned as one of the milestones in the historical background of the regional structure of Turkey.

Besides having a regional structure at NUTS-2 level, within the scope of the Innovating Regions of Europe (IRE) Network, in 2005, just like Bulgaria, Czech Republic, Estonia, Hungary, Israel, Lithuania, Malta, Norway, Poland, Romania, Slovakia, Switzerland, Turkey has also been involved 33 New-RIS projects in certain regions such as Mersin and Eskişehir (Metin, 2010).

Also, in the 2011 Progress Report[16], the preparation of regional plans in 24 of the 26 NUTS-2 regions under the coordination of DAs is shown as a progress within the institutional framework. Regional plans determine the relationships among plans, policies and strategies produced at the national level and the activities to be carried out at the local level. Besides producing the regional plans, with the production of regional innovation strategy documents in two RDAs (İzmir Development Agency and Middle Black Sea Development Agency denoted as İZKA and OKA, respectively) in 2012, the agencies have shown that they are playing a concrete role in innovation with their effective work. In addition to these two agencies, some other RDAs have also created regional innovation strategy documents in the following years. Therefore, the pioneering of these regional innovation strategy documents in 2012 is a milestone in regional innovation systems.

Regional innovation strategies of regional development agencies in Turkey

The RIS-Mersin project, started in 2005 as a region in IRE Network within the 6th Framework Programme of the EU, has an importance according to the reason of being the first regional innovation systems project of Turkey covering only Mersin province independently from the development agency.

Examination of the regional innovation strategies of the RDAs shows that some have already started to create regional innovation strategies since 2012 *(Fig. 1 and 2)*. A comparison of the regional innovation strategies is evaluated in terms of the visions in the regional plans and regional innovation strategies *(Tab. 1)*, main provisions of innovation strategies *(Tab. 2)* and studies of the RDAs after regional innovation strategy[17] as implementation, evaluation and monitoring mechanisms *(Fig. 3)*.

Regional development agencies generally create their innovation strategies together with advisory boards and technical commitees including representatives of relevant public and private sector actors, non-governmental organizations (NGOs), universities and national institutions. The RDAs generally used processes as the following steps: literature review, field works, current situation analysis on R&D and innovation, workshops, surveys, interviews, focus group meetings

[13] Decree of the Council of Ministers 14306 "Decision on establishment of development agencies in some level 2 regions", dated November 10, 2008. Available at: https://www.resmigazete.gov.tr/eskiler/2008/11/20081122-3.htm (in Turkish)

[14] Decree of the Council of Ministers 15236 "Decision on establishment of development agencies in some Level 2 regions", dated July 14, 2009. Available at: https://www.resmigazete.gov.tr/eskiler/2009/07/20090725-5.htm (in Turkish)

[15] Law on the establishment, coordination and duties of development agencies 5449, dated January 25, 2006. In: *The Official Gazette of Turkey, 45, 26074, dated February 8. Available at: http://www.mevzuat.gov.tr/MevzuatMetin/1.5.5449.pdf (in Turkish)*.

[16] Turkey 2011 Progress Report. Commission Staff Working Paper. P. 83. Available at: https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/pdf/key_documents/2011/package/tr_rapport_2011_en.pdf

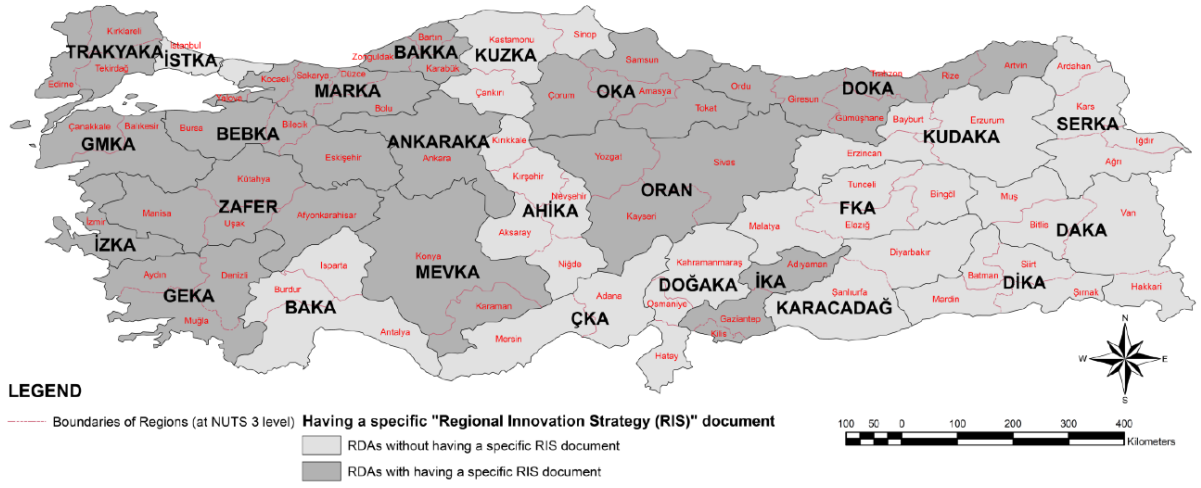
[17] Although there were some exclusive studies related to innovation before the regional innovation strategy documents, the success of the regional innovation strategy is considered based on the studies of the RDAs after the production year of the regional innovation strategy documents.

Figure 1. RDAs having a specific "Regional Innovation Strategies" document

Regional Development Agencies in Turkey (NUTS-2 Level)

	NUTS 2	RDA	PROVINCES IN THE REGION	ESTABLISHMENT YEAR
1	TR 62	Çukurova D. A. (ÇKA)	**Adana**, Mersin	2007
2	TR 31	İzmir D. A. (İZKA)	**İzmir**	2007
3	TR 10	İstanbul D. A. (İSTKA)	**İstanbul**	2008
4	TR 52	Mevlana D. A. (MEVKA)	Karaman, **Konya**	2008
5	TR 83	Middle Black Sea D. A. (OKA)	Amasya, Çorum, **Samsun**, Tokat	2008
6	TR A1	Northeast Anatolia D. A. (KUDAKA)	Bayburt, Erzincan, **Erzurum**	2008
7	TR B2	Eastern Anatolia D. A. (DAKA)	Bitlis, Hakkari, Muş, **Van**	2008
8	TR C1	Silkroad D. A. (İKA)	Adıyaman, **Gaziantep**, Kilis	2008
9	TR C2	Karacadağ D. A. (KARACADAĞ)	**Diyarbakır**, Şanlıurfa	2008
10	TR C3	Tigris D. A. (DİKA)	Batman, **Mardin**, Şırnak, Siirt	2008
11	TR 21	Trakya D. A. (TRAKYAKA)	Edirne, Kırklareli, **Tekirdağ**	2009
12	TR 22	South Marmara D. A. (GMKA)	**Balıkesir**, Çanakkale	2009
13	TR 32	Southern Aegean D. A. (GEKA)	Aydın, **Denizli**, Muğla	2009
14	TR 33	Zafer D. A. (ZAFER)	Afyonkarahisar, **Kütahya**, Manisa, Uşak	2009
15	TR 41	Bursa, Eskişehir, Bilecik D. A. (BEBKA)	Bilecik, **Bursa**, Eskişehir	2009
16	TR 42	East Marmara D. A. (MARKA)	Bolu, Düzce, **Kocaeli**, Sakarya, Yalova	2009
17	TR 51	Ankara D. A. (ANKARAKA)	**Ankara**	2009
18	TR 61	West Mediterranean D. A. (BAKA)	Antalya, Burdur, **Isparta**	2009
19	TR 63	Eastern Mediterranean D. A. (DOĞAKA)	**Hatay**, Kahramanmaraş, Osmaniye	2009
20	TR 71	Ahiler D. A. (AHİKA)	Aksaray, Kırıkkale, Kırşehir, Niğde, **Nevşehir**	2009
21	TR 72	Central Anatolia D. A. (ORAN)	**Kayseri**, Sivas, Yozgat	2009
22	TR 81	Western Black Sea D. A. (BAKKA)	Bartın, Karabük, **Zonguldak**	2009
23	TR 82	North Anatolian D. A. (KUZKA)	Çankırı, **Kastamonu**, Sinop	2009
24	TR 90	Eastern Black Sea D. A. (DOKA)	Artvin, Giresun, Gümüşhane, Ordu, Rize, **Trabzon**	2009
25	TR A2	Serhat D. A. (SERKA)	Ağrı, Ardahan, Iğdır, **Kars**	2009
26	TR B1	Fırat D. A. (FKA)	Bingöl, Elazığ, **Malatya**, Tunceli	2009

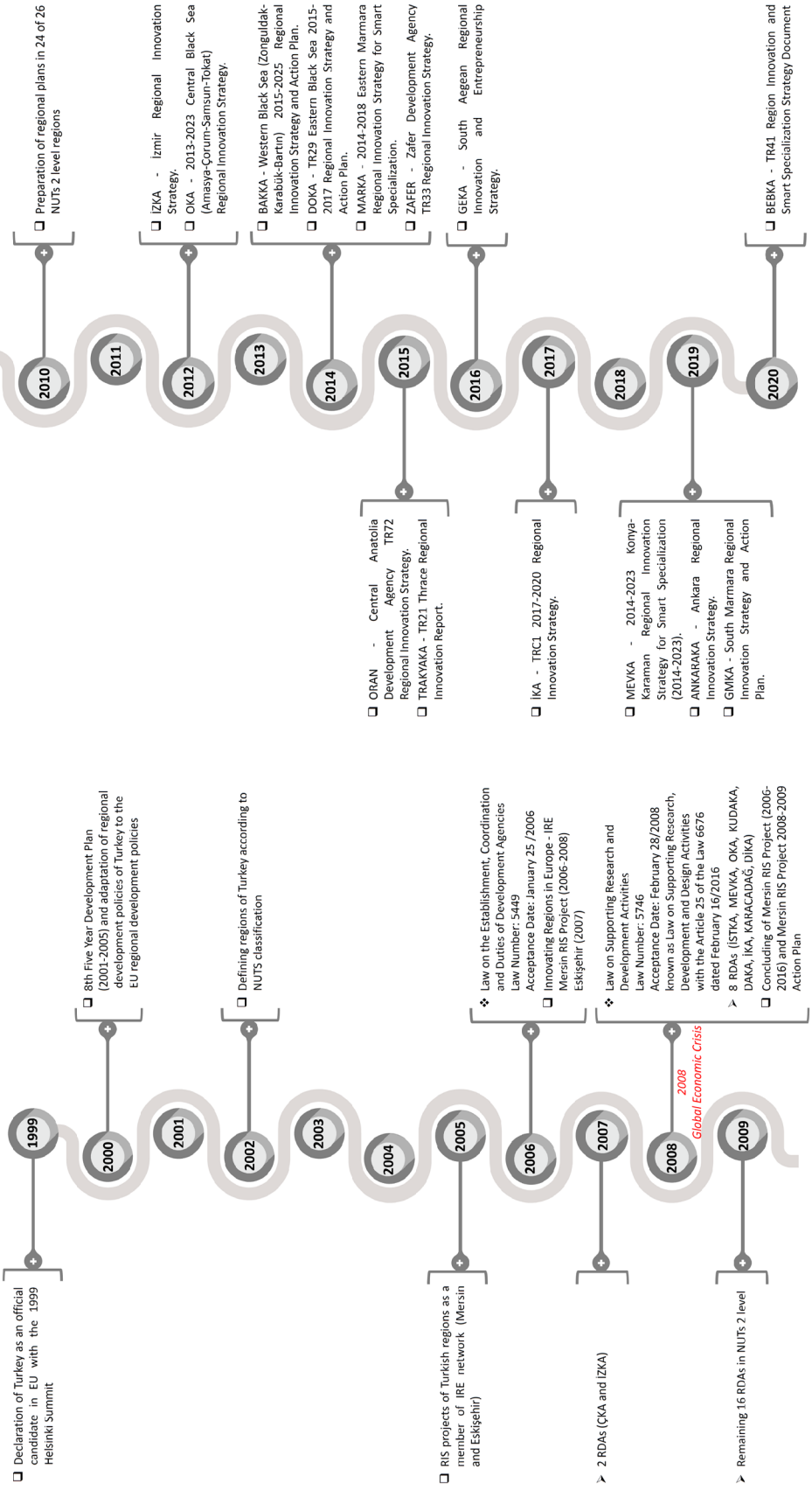
(*): Central provinces of the RDAs are given in bold in the text.



- ❑ 2012 : İZKA - İzmir Regional Innovation Strategy.
- ❑ 2012 : OKA - Middle Black Sea (Amasya-Çorum-Samsun-Tokat) Regional Innovation Strategy (2013-2023).
- ❑ 2014 : BAKKA - Western Black Sea (Zonguldak-Karabük-Bartın) 2015-2025 Regional Innovation Strategy and Action Plan.
- ❑ 2014 : DOKA - TR90 Eastern Black Sea Regional Innovation Strategy and Action Plan 2015-2017.
- ❑ 2014 : MARKA - East Marmara Regional Innovation Strategy for Smart Specialization 2014-2018.
- ❑ 2014 : ZAFER - Zafer Development Agency TR33 Regional Innovation Strategy.
- ❑ 2015 : ORAN - Central Anatolia Development Agency TR72 Regional Innovation Strategy
- ❑ 2015 : TRAKYAKA - TR21 Thrace Regional Innovation Report.
- ❑ 2016 : GEKA - South Aegean Regional Innovation and Entrepreneurship Strategy.
- ❑ 2017 : İKA - TRC1 2017-2020 Regional Innovation Strategy.
- ❑ 2019 : MEVKA - Konya-Karaman Regional Innovation Strategy for Smart Specialization (2014-2023).
- ❑ 2019 : ANKARAKA - Ankara Regional Innovation Strategy
- ❑ 2019 : GMKA - South Marmara Regional Innovation Strategy and Action Plan.
- ❑ 2020 : BEBKA - TR41 Region Innovation and Smart Specialization Strategy Document

Source: own elaboration.

Figure 2. Milestones of historical development process of regional innovation systems in Turkey



Source: own elaboration.

with a participation of representatives of relevant public and private sector actors, non-governmental organisations, universities and representatives from national institutions, SWOT and/or PEST analyses, stakeholder analysis, examination of different parameters, defining regional innovation ecosystem, measurement of innovation potential, supply, demand and capacity, determination of vision, priorities, innovation strategies, targets and actions.

When the visions in the regional plans of these 14 RDAs are examined; it is seen that most of the RDAs (İZKA, DOKA, MARKA, TRAKYAKA, GEKA, İKA, ANKARAKA and BEBKA) put emphasize on innovation in their visions of the regional plans. Although remaining RDAs are not directly focused on innovation in the regional vision, they have included innovation-related concepts such as learning region, competitiveness, knowledge, human and social capital. If the visions in the regional plans and the regional innovation strategies are compared, it has been determined that some agencies have defined innovation visions to create regional innovation strategies, and some have produced strategies in line with their regional plans without creating an innovation vision (see Tab. 1).

Table 1. Comparison of the visions

RDA	Vision in the regional plan	Innovation vision in the regional innovation strategies
İZKA	"İzmir as the centre of attraction of the Mediterranean, producing information, design and innovation" (İzmir Development Agency, 2014-2023 İzmir Regional Plan).	The regional innovation vision was not defined (İzmir Regional Innovation Strategy).
OKA	An environmentally sensitive, competitive, rapidly developing region, which has become Turkey's gateway to the Black Sea and which has raised its quality of life (Yeşilırmak Basin Development Project (Amasya, Çorum, Samsun, Tokat) Regional Development Master Plan, 2006).	"Thanks to innovative and entrepreneur society together with its competitive sectors, Middle Black Sea Region will be a pioneer region for development at national and international level in 2023 (Middle Black Sea (Amasya-Çorum-Samsun-Tokat) Regional Innovation Strategy (2013-2023))".
BAKKA	Becoming a region which has broken its dependent economic condition and raised its life quality (2014-2023 Western Black Sea Regional Plan).	Becoming a region with a high level of prosperity and quality of life which have succeeded the sustainable development with innovative and powerful sectors and competitive brandmarks in both national and international area in 2025 (Western Black Sea (Zonguldak-Karabük-Bartın) 2015-2025 Regional Innovation Strategy and Action Plan).
DOKA	The Eastern Black Sea with innovative and competitive economy, improved social welfare and quality of life by ensuring rural-urban integration, livable spaces, a sustainable environment and high human quality (TR90 Eastern Black Sea Regional Plan 2014-2023).	Eastern Black Sea Region converting its original values and unique resources into competitive and dynamic products and services. Competitive and dynamic Eastern Black Sea (TR90 Eastern Black Sea Regional Innovation Strategy and Action Plan 2015-2017).
MARKA	To be a human and knowledge-oriented and open to innovations trademark region in global competition and sustainable development, powered by its strategic location and collaboration networks, producing value with its versatile economic structure, steering the future with its rich human potential, making a difference with its quality of life (East Marmara 2014-2023 Regional Plan).	"Becoming a national technology commercialization center that can produce information and develop technology, follow global innovations and shapes itself, has specialized in automotive, machinery and electrical machines, and develops key enabling technologies (East Marmara Regional Innovation Strategy for Smart Specialization 2014-2018)."
ZAFER	A learning region that pursues ecological balance, creates added value with its knowledge-based economy, increases competitiveness and quality of life, develops in a balanced way (TR33 Regional Plan 2014-2023).	The starting point of this project is to increase the competitiveness, which is in the vision and one of the development axes determined in the 2010-2013 Regional Plan (TR33 Regional Innovation Strategy).

End of Table 1

RDA	Vision in the regional plan	Innovation vision in the regional innovation strategies
ORAN	"Competitive in national and international level, accessible to humanity and social capital, improved potentials, improved quality of life by improving urban and social infrastructures, accessible Central Anatolia (TR72 Region 2014-2023 Regional Plan)".	It has been defined that a «Regional innovation strategy» will be developed under the priority of Competitiveness Axis «Development of R&D and Innovation» in the TR72 Region 2014-2023 Regional Plan. Innovation committees were formed from the relevant institutions and individuals in the provinces and their opinions were taken and the innovation vision and innovation strategies were determined (Central Anatolia Development Agency TR72 Regional Innovation Strategy).
TRAKYAKA	"Thrace developing with its high added value production whilst preserving its natural and cultural values, where collaboration and innovation prevails, and where the standard of life and wellbeing is at its highest (TR21 Thrace Region 2014-2023 Regional Plan Summary)".	The regional innovation vision was not defined, and it was stated that the study was carried out to increase the innovation capacity of the region based on the regional vision in the Regional Plan (TR21 Thrace Regional Innovation Report).
GEKA	South Aegean as a global tourism focus with a high quality of life, producing based on innovation, protecting its nature (TR32 Level 2 Region 2014-2023 Region Plan).	The regional innovation vision was not defined (South Aegean Regional Innovation and Entrepreneurship Strategy).
İKA	Silkroad as the center of attraction of the Middle East, with high quality of life, strong human capital, competitive and innovative capacity (TRC1 Gaziantep-Adıyaman-Kilis Regional Plan 2014-2023).	Center of Innovation from Tradition to Future: Silk Road (TRC1 Regional Innovation Strategy 2017-2020).
MEVKA	Becoming a region with high and balanced prosperity level, integrated with international economies, preferred by people to work, produce and live in under the principle of compassion and tolerance (Konya-Karaman 2014-2023 Region Plan).	The regional innovation vision was not defined, and it was stated that the study was carried out based on the regional vision in the Regional Plan because this document is a sub-strategy document of the 2014-2023 Regional Plan (Konya-Karaman Regional Innovation Strategy for Smart Specialization (2014-2023)).
ANKARAKA	"Presenting a High Quality of Life and Competing With the World, the Capital of Knowledge and Innovation Ankara (Ankara Regional Plan 2014-2023)".	Visions in the health, informatics and agriculture-food sectors, which are the 3 pilot sectors selected within the scope of creating a future vision within the scope of the Regional Innovation Strategy, adhering to the regional vision in the Ankara Regional Plan (Ankara Regional Innovation Strategy).
GMKA	"A South Marmara with more qualified labor, competitiveness and viability (TR22 South Marmara Regional Plan 2014-2023)".	The South Marmara Region will be a region that has achieved its development goal in 2023 with its trained human resources, educational institutions, innovation and entrepreneurship culture and competitive sectors. (South Marmara Regional Innovation Strategy and Action Plan)
BEBKA	Internationally competitive, sustainable production, innovation and life center carrying the heritage of the past from establishment to salvation into the future by adding value (Bursa, Eskişehir, Bilecik Regional Plan 2014-2023).	The regional innovation vision was not defined, and it was stated that the study was carried out based on the regional vision in the Regional Plan. The innovation and smart specialization strategy prepared for the TR41 Region has also been considered within the framework of the vision defined in the regional plan, and it adopts a more competitive, more innovative and more sustainable approach taking regional characteristics into account (TR41 Region Innovation and Smart Specialization Strategy Document).
Source: own elaboration based on the regional plans and the regional innovation strategies documents of RDAs.		

According to the regional innovation strategies of the RDAs, only 14 of the RDAs currently have a specific regional innovation strategy including İZKA and OKA as the leading agencies to produce regional innovation strategies. Although some RDAs do not have specific regional innovation strategies, they have various studies on different innovation dimensions, but these studies are exclusive and far from a holistic approach. Unfortunately, some agencies are currently unable to prioritize innovation.

While 12 (İZKA, OKA, BAKKA, DOKA, MARKA, ZAFER, ORAN, TRAKYAKA, İKA, MEVKA, GMKA and BEBKA) of these 14 agencies produced strategies on innovation dimensions, only two (GEKA and ANKARAKA) created sectoral strategies. GEKA defined problems and recommendations regarding competitive sectors in each province, and ANKARAKA developed priority strategies, targets and action plans for five prominent sectors *(Tab. 2)*.

If the regional innovation strategies of these 14 agencies are evaluated, they are similarly focusing on the following:

– creating and developing the research and innovation culture,
– strengthening the research and innovation infrastructure,
– developing the institutional structure,
– developing human resources,
– increasing the accessibility to various financial resources (funding, support programmes etc.),
– improving effective communication, cooperation and coordination,
– developing the entrepreneurship and innovation ecosystem,
– organizing and increasing the awareness activities,
– establishing and developing clusters,
– focusing on specialized/priority/prominent/strategic sectors,
– encouraging social innovation,
– increasing IPR and commercialization.

When the agency studies conducted after the regional innovation strategies are examined, it is seen that the agencies that produced the strategies in the past years have made substantial headway.

Table 2. Comparison of main strategies in the regional innovation strategy documents

RDA	Innovation strategies
İZKA	Strategic Priorities: 1. Strengthening the research and innovation infrastructure. 2. Developing institutional structure and capacity in science and technology fields. 3. Developing human resources in science and technology fields. 4. Patenting research results and supporting commercialisation. 5. Facilitating access to funding. 6. Improving the entrepreneurship and innovation ecosystem.
OKA	Strategic Goals: 1. Turning the region into an international brand mark (for) having high competitiveness in strategic sectors. 2. Becoming an attraction center for qualified labor thanks to companies with high innovation performance. 3. Hosting R&D and innovation centers of national and international companies thanks to suitable environment for innovation and incentives. 4. Increasing the comfort and the quality of life of the whole society through “Inclusive innovation” approach. Strategic Breakthroughs: 1. Increasing innovation performance of private sector and increasing entrepreneurship based on innovation. 2. Strengthening R&D and Innovation Infrastructure and Human Resources. 3. Encouraging and disseminating social innovation and innovation in public services.

Continuation of Table 2

RDA	Innovation strategies
BAKKA	Strategic Goals: 1. To become the locomotive of regional development of priority sectors of Western Black Sea Region through the R&D and innovation. 2. Converting of regional economy into an innovation and information based economy that successfully executes the information and technology transfer from universities to the firms and public sector. 3. Becoming a center of attraction for qualified investments with the creation of a dynamic innovation ecosystem. 4. Establishment of a culture using innovation as a driving force in social development and therefore providing the increase of the prosperity and the quality of life. Strategic Breakthroughs: 1. Ensuring Awareness and Consensus in Innovation Based Development. 2. Strengthening the Information and Technology Generation and Transfer Capabilities of universities. 3. Increasing the quantity and quality of R&D and innovation activities in priority sectors.
DOKA	Development Axes: 1. Creating innovation culture. 2. Strengthening of regional innovation systems. 3. Increasing innovative output.
MARKA	Strategic Priorities: 1. Focusing on Prioritized Areas. 2. Innovation Infrastructure. 3. Cooperation and Innovation Culture. 4. Financing. 5. Promotion and Dissemination.
ZAFER	Strategic Priorities: 1. Improving human resources. 2. Strengthening the research and innovation infrastructure. 3. Strengthening the institutional structure. 4. Improving the market conditions. 5. Improving social capital and supporting networks.
ORAN	Strategic Priorities: 1. Increasing the Utilization Rate of Supports, Facilitating Access to Finance and Improving Institutional Capacity. 2. Increasing Cooperation Between Institutions. 3. Increasing the Technology Level. 4. Improving Research Infrastructure. 5. Improving Intellectual Property Rights. 6. Introducing, Disseminating and Updating the Regional Innovation Strategy.
TRAKYAKA	Strategic Goals: 1. Development of entrepreneurship and innovation ecosystem. 2: Strengthening the research and innovation infrastructure. 3: Support the patenting and commercialization of research results.
GEKA	1. Problems and recommendations regarding competitive sectors in Aydın 1.1 Dried Fruit and Nuts (Figs) Sector. 1.2 Olive and Olive Oil Sector. 1.3 Milk and Dairy Industry Sector. 1.4 Food and Agricultural Machinery Industry. 2. Problems and recommendations regarding competitive sectors in Denizli 2.1 Milk and Dairy Industry Sector. 2.2 Fruit-Vegetable and Medicinal-Aromatic Plants Sector. 2.3 Cable Sector. 2.4 Textile Sector. 3. Problems and recommendations regarding competitive sectors in Muğla 3.1. Aquaculture Sector. 3.2. Marble Sector. 3.3. Yacht and Boat Manufacturing Sector. 3.4. Beekeeping and Honey Products Sector.

End of Table 2

RDA	Innovation strategies
İKA	Priority Axes: 1. Developing innovation awareness, capacity and willingness. 2. Increasing accessibility to innovation support elements. 3. Increasing cooperation among innovation ecosystem members.
MEVKA	Strategic Goals: 1. Developing R&D and innovation culture. 2. Improving the infrastructure. 3. Strengthening human capital. 4. Strengthening collaborations on the basis of smart specialization. 5. Increasing access to financial resources.
ANKARAKA	Priority strategies for five prominent sectors: IT Sector 1. Use of new technologies in the IT sector. 2. Generalizing the use of information technologies in the sectors. Medicine and Medical Devices Sector 1. Development of export in the medicine and medical device sector. 2. Advanced technology high value-added products. 3. R&D and development of production ecosystem. Construction Machinery Sector 1. Creating the brand value of "Turkish Construction Machinery" and introducing to the world. 2. Development of domestic production in critical parts. 3. Qualified engineer and interim staff training. Defence and Aviation Sector 1. Increasing export capacity in the defence and aviation sector. 2. Production capacity improvement. 3. Development of human resources competences. Agriculture and Food Sector 1. Realizing the digital transformation in the agriculture and food industry in Ankara / creating a high added value and efficient sector focusing on advanced technology and agricultural industry and biotechnology. 2. Increasing the share of special agricultural products of Ankara in foreign trade.
GMKA	Strategic Priorities: 1. Increasing the R&D and Innovation Capacity and Performance of the Private Sector. 2. Development of Entrepreneurship and Innovation Culture in the Region. 3. Strengthening the Education, Research and Innovation Infrastructure in the Region.
BEBKA	Eight intervention areas forming the TR41 Region Smart Specialization Strategy Action Plan: 1. Supporting capacity building and collaborations in R&D centers. 2. Development of support and coordination opportunities within the scope of localization. 3. Developing the capacity to create and manage a common platform. 4. Increasing the transitivity between industry and university. 5. Supporting capacity building in firms and developing human resources. 6. Ensuring the internalization of open innovation concept by firms and supporting access to open innovation platforms. 7. Development of firms in the position of supplier of main industrial firms. 8. Developing the role and supports of the Development Agency in the smart specialization process.
Source: own elaboration based on the regional plans and the regional innovation strategies documents of RDAs.	

As the next step, the support programs, reports, publications, strategies and researches as thematic and sector analyses produced by the RDAs were examined in detail in order to understand whether the implementation of the regional innovation strategies could be realized or not. Although producing and implementing dates of the regional innovation strategies of the RDAs differ from one another, RDAs have studies focusing on the local production and prominent sectors of the regions. The main reasons why regions vary in success of the regional innovation strategies are related to the diversities in the dynamics/features, local production, sectoral specialization and the R&D, knowledge and innovation potentials of the regions *(Fig. 3)*.

After the regional innovation strategy, it has been determined that İZKA's works and financial support programs are focused mainly on knowledge, entrepreneurship, information communication technologies, renewable energy, small and medium-sized enterprises (SMEs), small scale industrial zones, clusters and prominent sectors especially environmental technologies. The innovation success stories, the measurement of innovation indicators, the production of innovation ecosystem analysis and monitoring reports, and the creation of evaluation reports of financial support programs after the regional innovation strategies make ZKA successful at the achiving the goals.

OKA's works and financial support programs mainly consider entrepreneurship, foreign trade, exports and imports, market, competitiveness, SMEs, organized industrial zones (OIZs), crossborder collaboration, public-university-industry collaboration, youth employment, vocational and technical education, social innovation, R&D centers, regional business incubation centers network, and geographically indicated products. Also OKA produced many pre-feasibility reports in various sectors. Like İZKA, the creation of the audit and evaluation reports of the financial support programs, the production of regional innovation strategy activities and the mid-term evaluation report of the regional innovation strategy make OKA successful, too.

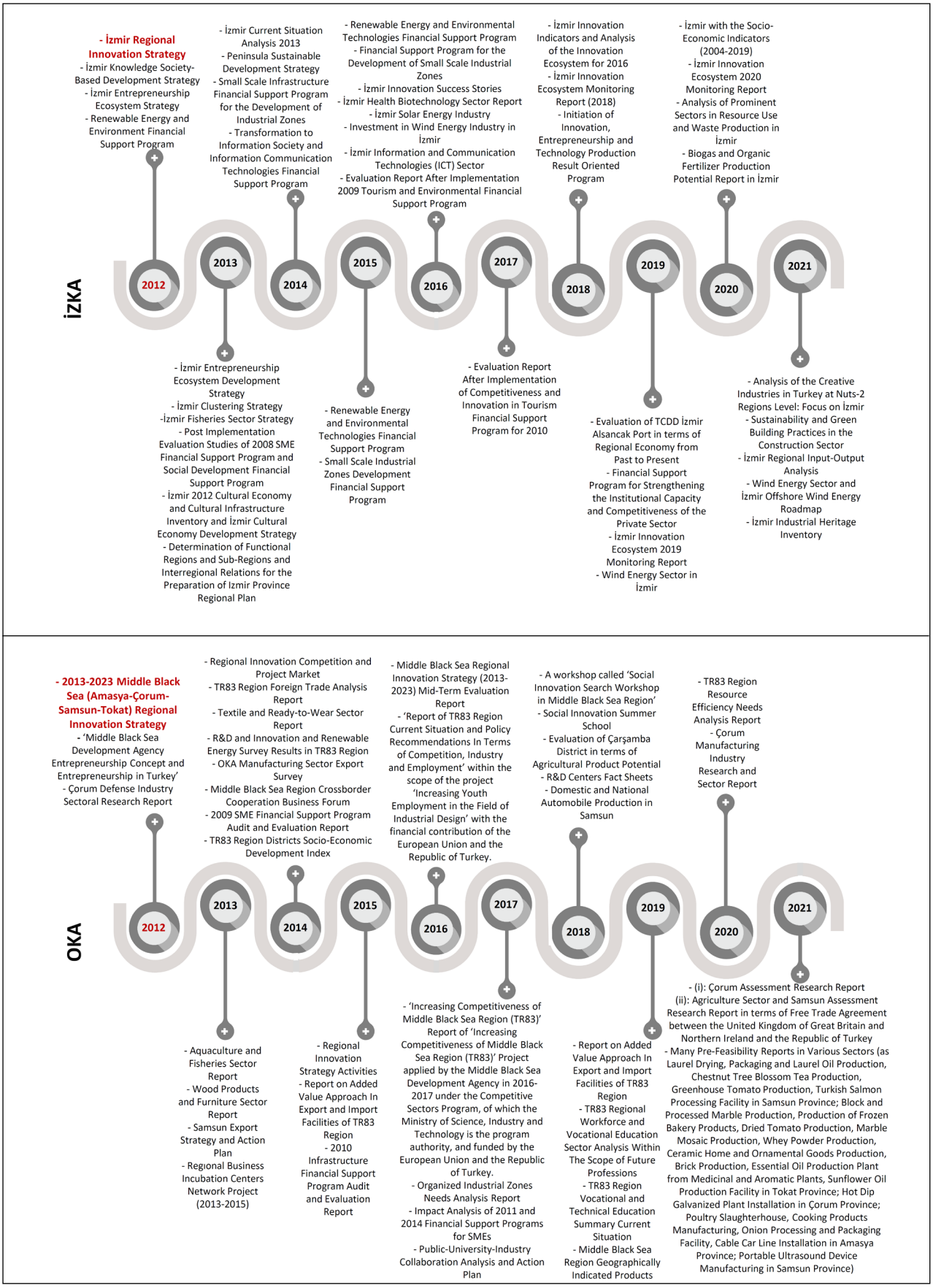
BAKKA focuses on prominent sectors, migration, competitiveness, exports, OIZs, SMEs, technology centers, clusters, local values, geographical indications products, and labor market. There are many pre-feasibility reports in various sectors. BAKKA produced evaluation reports after the support programmes. For Bart n province, BAKKA has "R&D and innovation potential" report and R&D, innovation and entrepreneurship ecosystem analysis.

DOKA's works and financial support programs are related mainly on clusters, SMEs, alternative financing sources, local products, women and youth entrepreneurship, geographical indications, foreign trade and target market. As previous RDAs, DOKA has many pre-feasibility reports in various sectors based on agro-industries. There are evaluation and impact analysis reports after the financial support programs.

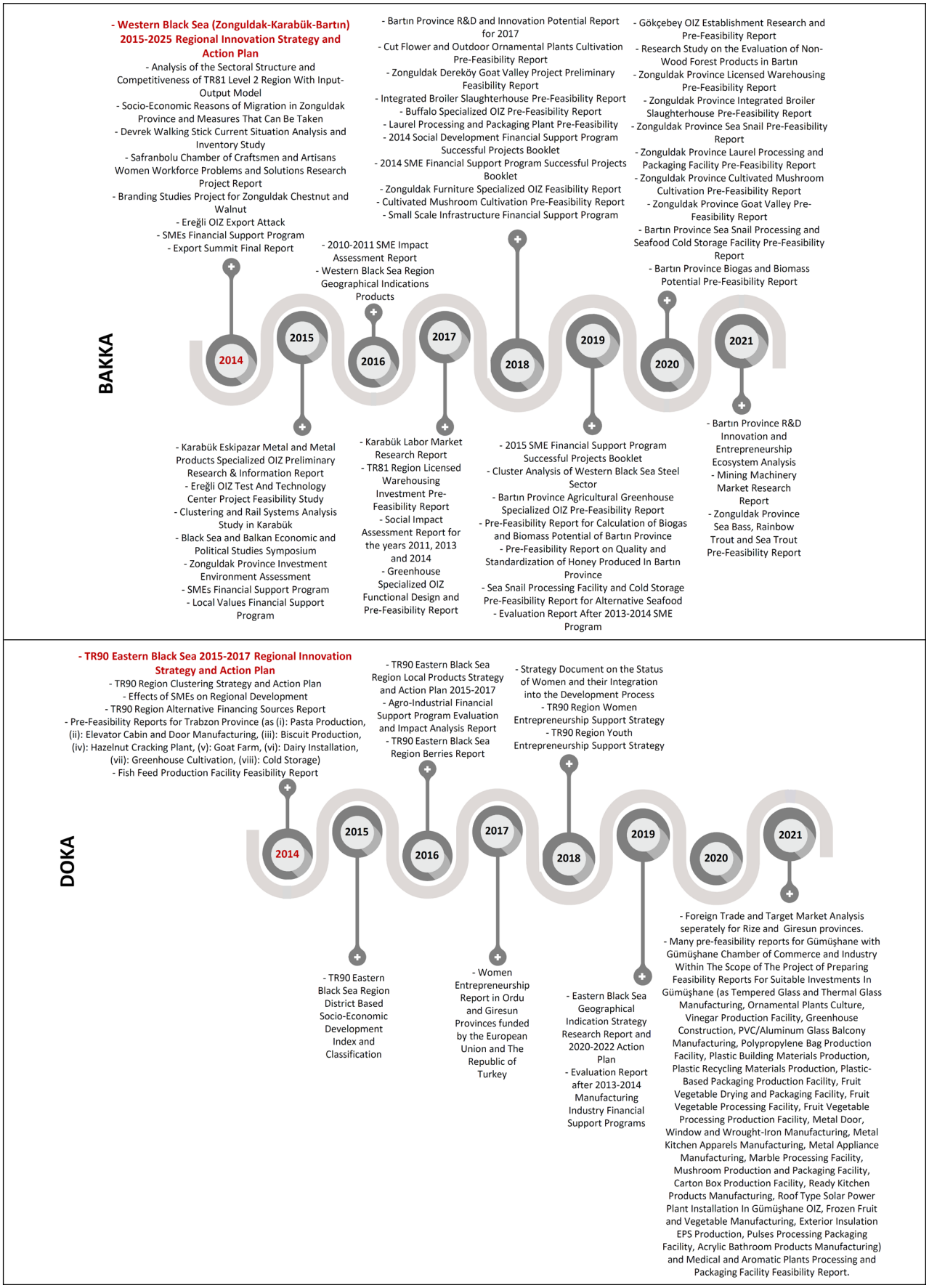
MARKA focuses on immigration, OIZs, logistic centers, technology transfer, informatics valley, entrepreneurship, vocational education, R&D centers, SMEs, and various prominent sectors mainly informatics and manifacturing sectors. The RDA provides innovation mentorship to the SMEs.

ZAFER works on exports, branding and marketing, industrial inventory, SMEs, clusters, professional competencies, entrepreneurship, vocational education, competitiveness, product diversity, local products, logistic centers, patent and trademark capacities, OIZs, and various prominent sectors mainly on traditional arts, gastronomy, machinery, mining, agriculture, environment and energy.

Figure 3. Studies of the RDAs after regional innovation strategy



Continuation of Figure 3



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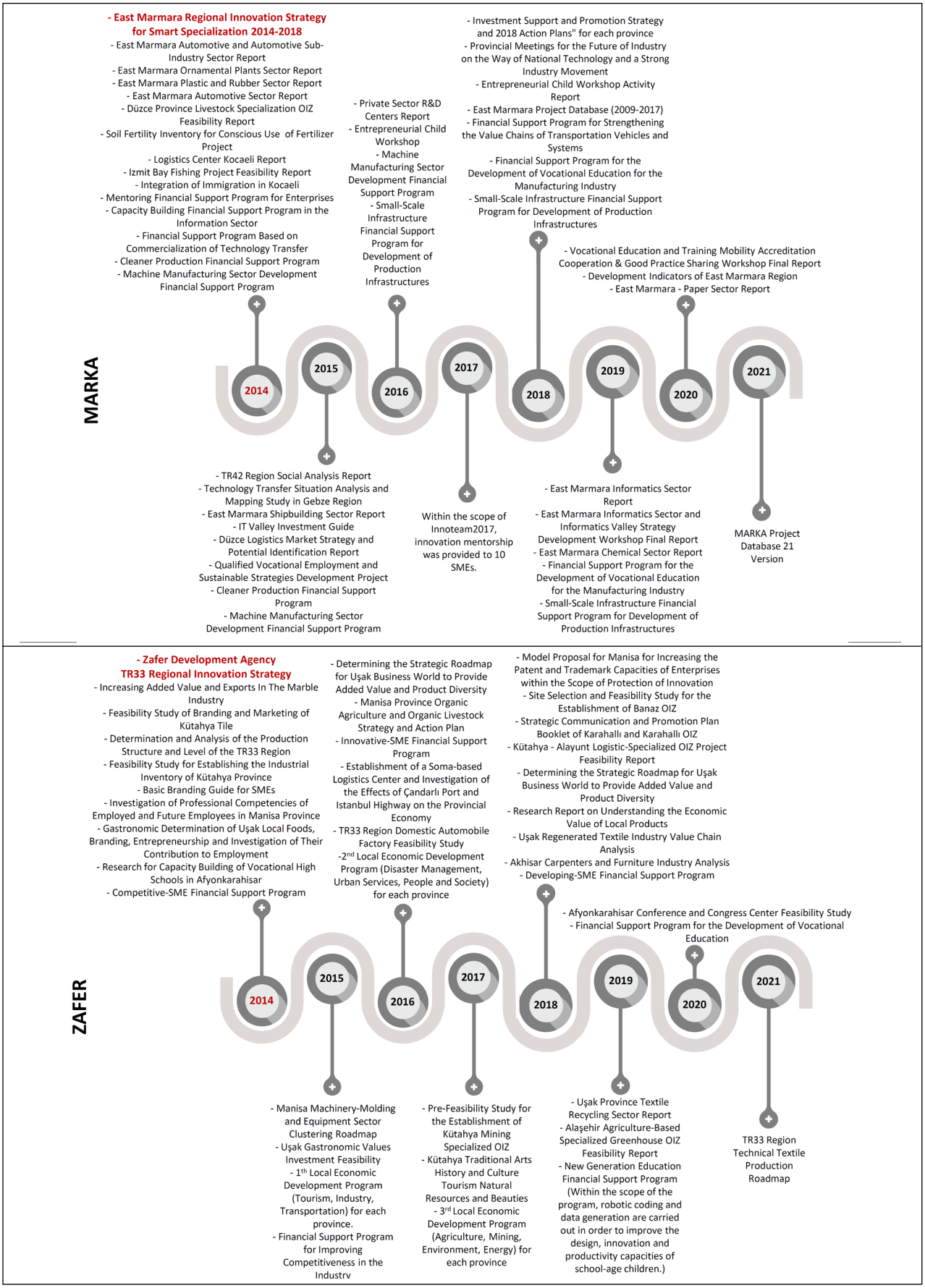

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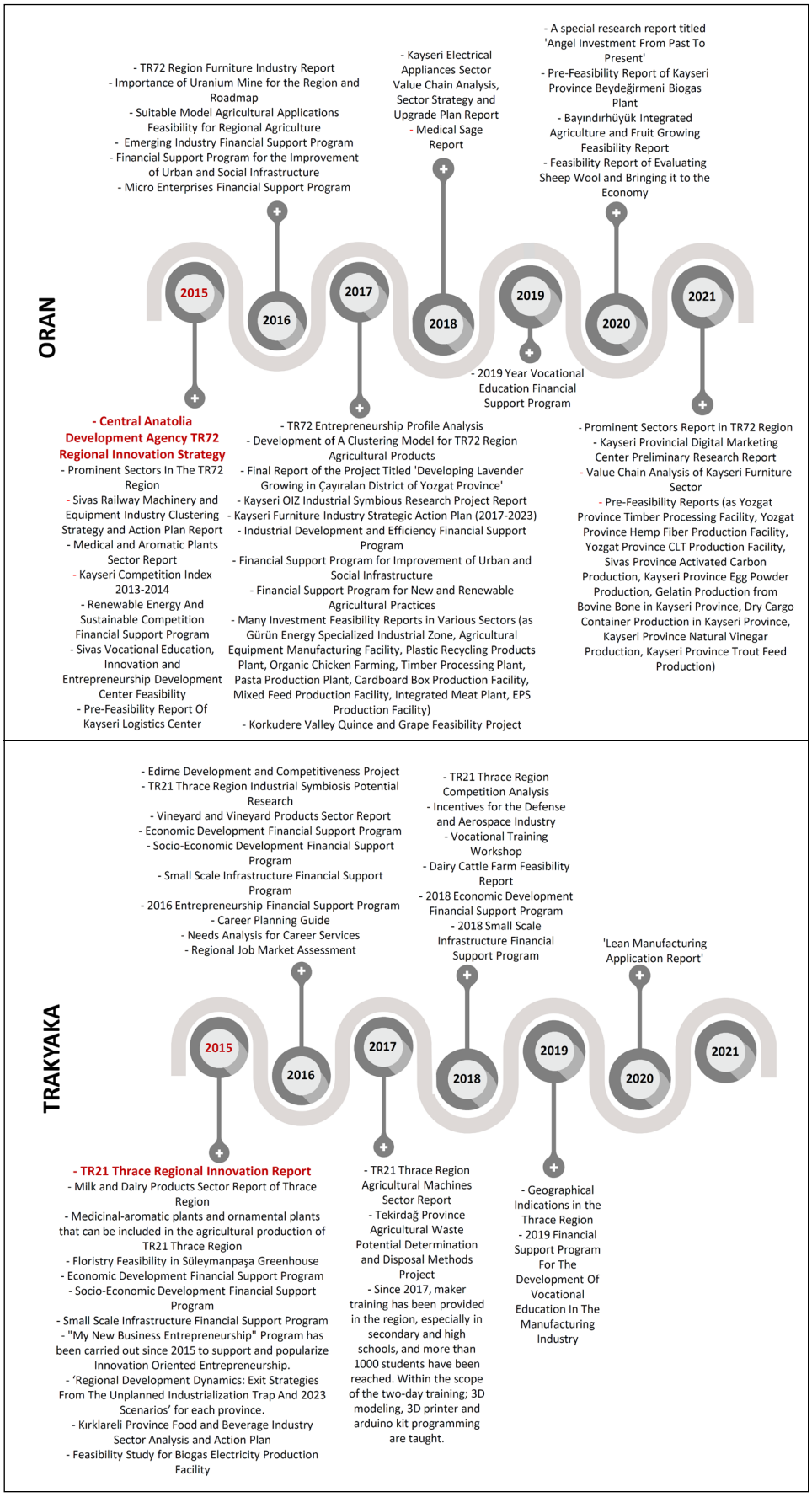

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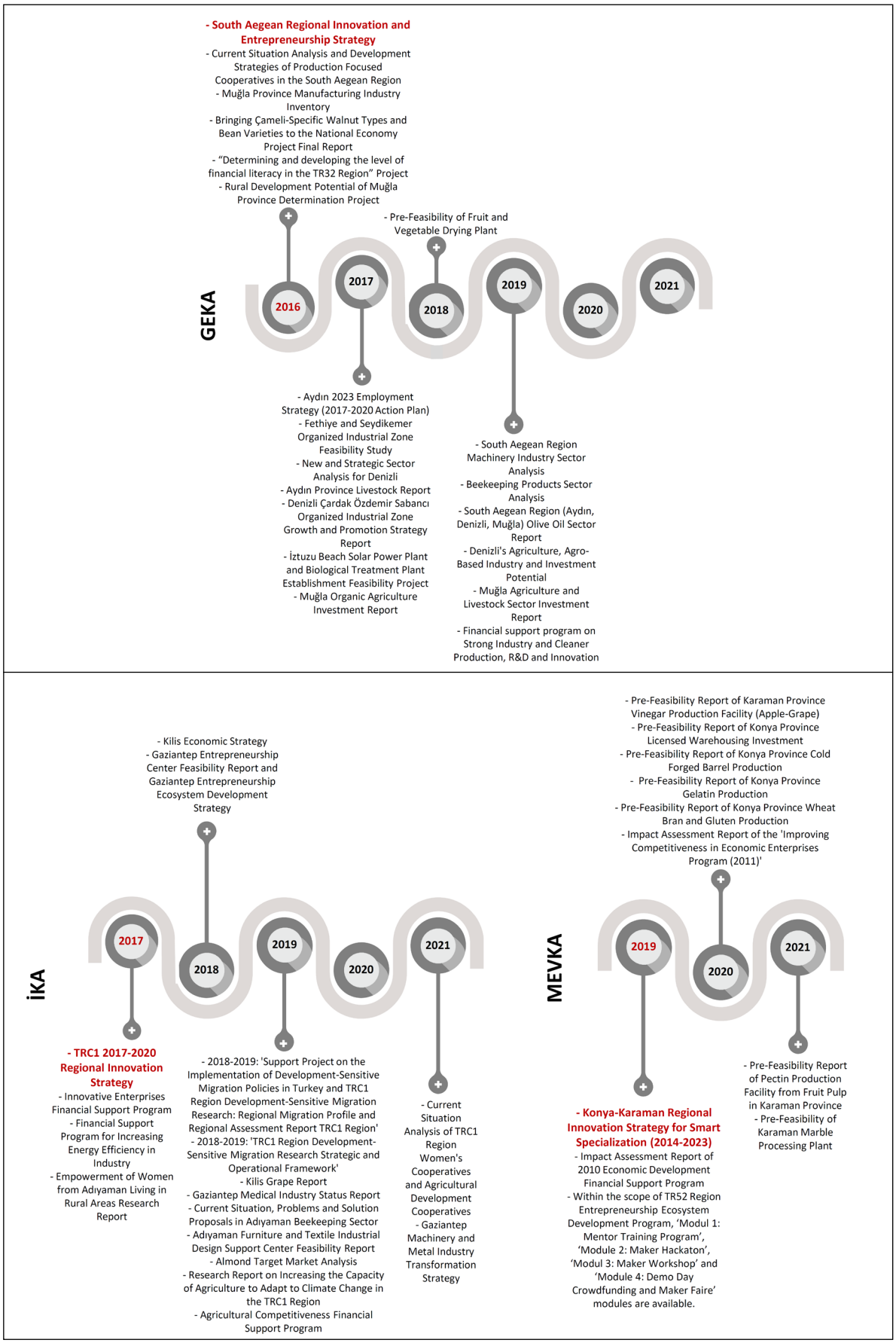

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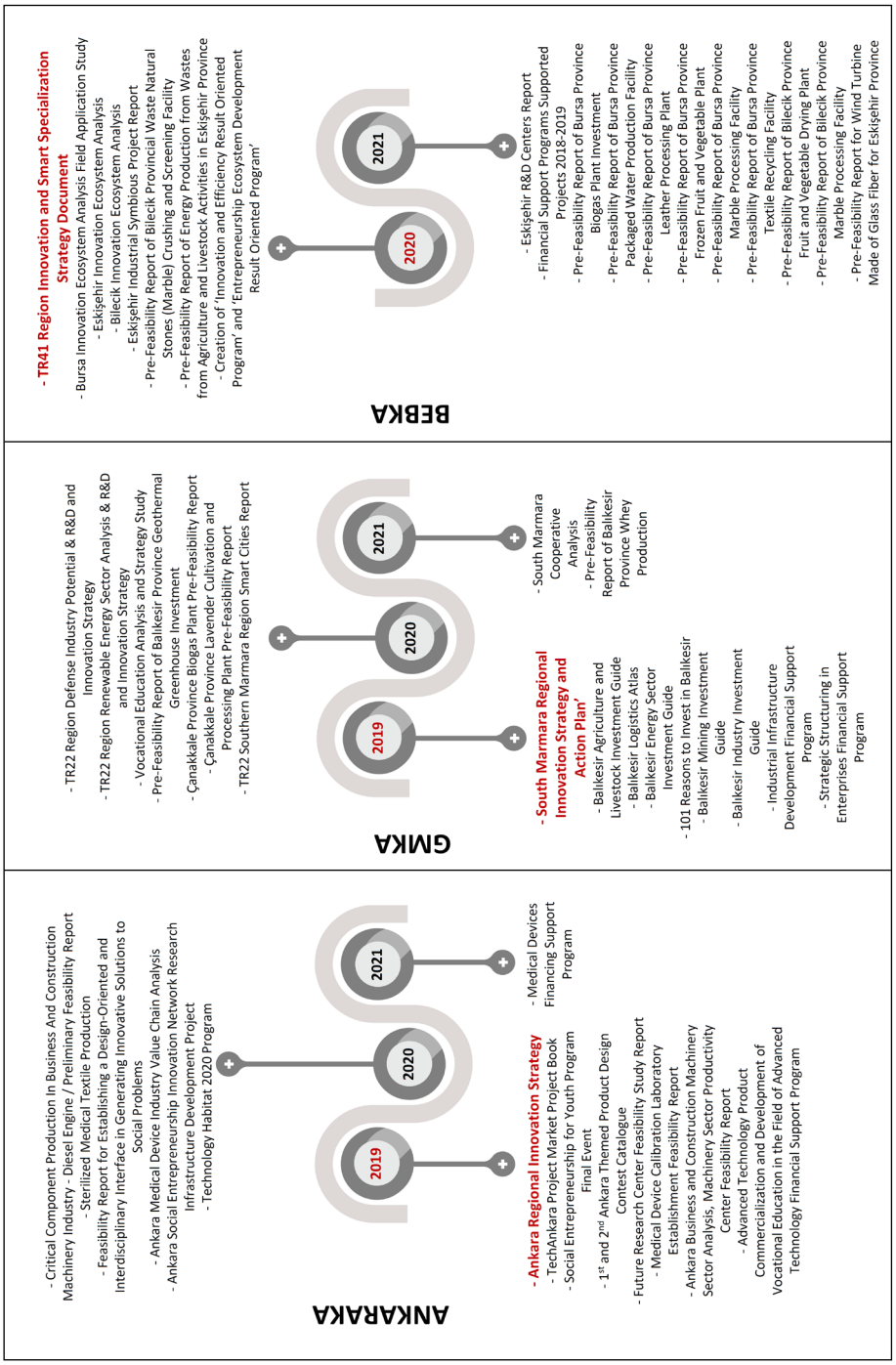

Source: own elaboration based on the work programs, action plans, support programs, reports, publications of strategies and researches as thematic and sector analyses of the RDAs.

ORAN deals with entrepreneurship, logistic centers, competitiveness, industrial symbiosis, renewable energy, vocational education, clusters, digital marketing, and sectors mainly as furniture industry, medical services, energy and agriculture. There are many pre-feasibility reports based on production and investment related to the prominent sectors. There is also a special research report on angel investments.

TRAKYAKA's works focus on issues such as competitiveness, industrial symbiosis, entrepreneurship, career services, job market, vocational education, maker training, geographical indications, and the RDA has sectoral reports mainly based on agriculture and livestock. In order to support and popularize innovation oriented entrepreneurship, a program also has been carried out since 2015 by TRAKYAKA.

GEKA works are related to entrepreneurship, cooperatives, manufacturing industry inventory, financial literacy, OIZs, R&D, and strategic sectors such as agriculture and livestock.

İKA focuses on entrepreneurship, agricultural competitiveness, target market, migration policies, empowerment and cooperatives of women, and various sectors especially agriculture.

MEVKA has entrepreneurship ecosystem development program. The RDA has some pre-feasibility reports related to various sectors. MEVKA also produced impact assessment reports of previous programs.

ANKARAKA focuses on market, social entrepreneurship for youth program, "product commercialization and development of vocational education in the field of advanced technology", social entrepreneurship, and sectors such as the IT sector, medicine and medical devices sector, construction machinery sector, defence and aviation sector and agriculture and food sector.

GMKA has specific strategy documents as "Defense Industry Potential & R&D and Innovation Strategy" and "Renewable Energy Sector Analysis & R&D and Innovation Strategy" in addition to the regional innovation strategy. The RDA is also interested in vocational education analysis and strategy study. GMKA deals with enterprises and cooperatives.

BEBKA has innovation ecosystem analysis, and many pre-feasibility reports for various sectors. The RDA also has reports of "industrial symbious project" and "R&D centers" for Eskişehir province.

Comparative evaluation and concluding remarks

This paper evaluates the regional innovation system of Turkey by comparing the regional innovation strategies of RDAs. It was seen that only 14 RDAs have regional innovation strategies. When the visions in the regional plans of these are examined, it is observed that most of these 14 RDAs focused on innovation in their visions of the regional plans, however some RDAs did not put emphasize directly on innovation in the regional vision but included some innovation-related concepts. In order to produce regional innovation strategies, some of the RDAs have created innovation visions, while the others made progresses in innovation strategies in line with their regional plans without creating an innovation vision. The paper states that the visions defined in the regional plans and regional innovation strategies of the RDAs differ in terms of regional dynamics.

Comparative evaluation reveals that some agencies have created a specific regional innovation strategy whereas the others have not yet developed specific regional innovation strategies and have various studies on different innovation dimensions, but these studies are exclusive and far from a holistic approach. The comparative evaluation also reveals that regional innovation strategies of the RDAs differ

in terms of regional priorities. Nevertheless, similar strategies created by the RDAs address developing the research and innovation culture; research and innovation infrastructure; institutional structure; human resources; financial resources; effective communication, cooperation and coordination; entrepreneurship and innovation ecosystem; awareness of innovation activities clusters, specialized/priority/prominent/strategic sectors; social innovation, IPR and commercialization, etc.

Although there are some efforts to improve the regional innovation systems by the RDAs, the comparative evaluation demonstrates that RDAs have not yet reached the desired level of producing a holistic regional innovation strategy and they should be more effective as a key actor in the regional innovation systems.

Most of the agencies create studies, publications, action plans, work plans and support programs to realize their innovation strategies and generally give priorities to innovation in the financial support programs. In addition, İZKA and OKA, as the leading agencies, create innovation ecosystem analysis, evaluation and monitoring reports in certain years to reveal how much they have achieved their innovation strategies.

On the one hand, the success of produced innovation strategies depends on the future work of these RDAs. On the other hand, in order to be successful, it is essential to determine how the strategies will be reflected and integrated with the spatial patterns.

Regional innovation system of Turkey will be successful if these efforts can be evaluated and implemented with a broad participation of actors including the representatives of relevant public and private sector, NGOs, universities and national institutions that are effective in regional innovation system and an integrated interactive innovation process including a defined realistic regional vision, strategic goals, strategic breakthroughs and action plans. If the determination of how these strategies will be reflected and integrated into spatial patterns is not considered as an important issue, the strategies will remain only in theory.

Designing and developing regional innovation strategies is not enough to establish and manage an effective regional innovation system. It is important that these strategies should be carried out with the responsible stakeholders within the specified time periods. Potential factors that would limit the implementation of the strategies should be determined in advance and minimized. Furthermore, the implementation of the strategies, monitoring, evaluation and performance measurement gain importance in innovation processes.

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