

# **Innovation & Inclusion in East Negev's Industry 4.0 Cluster**

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## **1. Scientific Background and Contribution**

The goal behind establishing the East Negev Innovation Center (ENIC) in Dimona is to promote advanced manufacturing according to the 'fourth industrial revolution' (also known as 'industry 4.0'). Israel is a world leader in innovation. Yet, mass production, which relies on unskilled labor, has mostly moved to countries with a low-cost workforce. The fourth industrial revolution is making many unskilled human resources redundant, on one hand creating automatization but also requiring only skilled workers to execute this. These labor market changes affect a household's vulnerability, long-term welfare position, and financial stability. To mitigate the adverse effects of this technology shock, we are witnessing government requests to increase their deficit to fund infrastructure and technology developments.

An advanced alternative strategy for lagging regions (see 'smart specialization' in EU) is based on the vision that each geographic region should act as a sustainable ecosystem—relying on a unique economic cluster (see Porter, 1990). Clusters leverage local assets to create a 'collaborate to compete' agenda (Wagner, 2021) by provides solutions to international demands based on local infrastructure, entrepreneurial activity, and an active value-based community.

The planned 'industry 4.0' cluster is located in the Eastern Negev in Israel, home to small-medium Jewish and Bedouin communities, and gathers stakeholders from the business sector, the public sector at local and national levels, and the third sector. However, it is still unclear how the future fruits of this publicly funded initiative will trickle down to local (low income) communities. There is a wide research gap about systematic links between innovation and inclusion, especially in lagging regions. The contribution of this proposed research to new scientific knowledge can be divided into theoretical and practical.

*a) Theoretical contribution: promoting innovation by building a place-based ecosystem*

In this research, I argue that to achieve growth through innovation, a partial shift from direct firm subsidies to an alternative strategy of place-based policy would be more efficient. The cluster place-based approach seeks to achieve economic growth based on leveraging resources and connecting local players.

The traditional policy argues for spatial market failure in cities and regions located outside of big metropolitan areas. This market failure is expected to erase entire areas from the innovation map and widen the core-periphery gap. Therefore, the lack of government manufacturing subsidies will lead to under-investment in the business sector and increased unemployment rates in lagging regions (Schweiger et al., 2018). However, subsidy impact on the development of firms' economic performance is scrutinized in articles that show direct subsidies have not expanded firm productivity, investment in R&D, local employment, and exports (Karhunen and Huovari, 2015; Martin et al., 2011).

This policy of direct firm subsidies was and still is the leading strategy for attracting companies to Negev. An alternative strategy is called 'place-based policy,' in which the government's role is mainly to coordinate between the various local actors involved in

sparkling innovation (Etzkowitz and Leydesdorff, 2000; Sonn and Storper, 2008). This general approach focuses on innovative product development as the output of a local process. Accordingly, it encourages governmental support (financial and organizational) to strengthen networks and collaborations between various stakeholders within the local innovation ecosystem (Martin, 2016). Examples of this policy can be found in establishing funds for joint research industry-academy, giving access to private government firms or academic data and facilities, and establishing patent-based companies owned by academia and the private sector. Empirical studies support the idea that place-based innovation policies encouraging local collaborations positively impact private investment in R&D, patents, and local employment (Engel et al., 2016; Kang and Park, 2012).

*b) Practical contribution: promoting inclusion by building an impact investment ecosystem*

Stakeholders must ensure that fruits of the cluster reach the local community through a highly equitable spread. The inflow of investment to the Negev region will initially take place within the new manufacturing cluster. The local community can further increase the project's productive capacity by investing in employee training. This can be achieved with 'local talent development systems': new schools, new programs, mentoring, workforce development training, and more. The ecosystem for impact investment will connect multi-sectorial players at both local and national levels, creating 'local talent development systems.' In this research, I propose to arm policymakers with a detailed 'roadmap' to build Israel's first impact investment ecosystem (to the best of my knowledge).

## **2. Research Goal and Research Questions**

The research goal is to present the scientific community and policymakers with new knowledge about systematic linkages between innovation and inclusion in lagging regions.

The research will examine novel approaches to address challenges depicted in the following research questions:

- a) What is the best way to promote growth outside of the central metropolitan area?
- b) How can stakeholders make this growth sustainable and inclusive for local communities?
- c) What is the interface between innovation and inclusion in lagging regions?

### **3. Practical and Social Impact**

This work has spatial insight and potential for future policy recommendations in Negev. Specifically, the study contributes to the growing interest in a theoretical framework that seeks to understand the interface between innovation and inclusion in a peripheral region. A better understanding of this process will help us draw up strategic recommendations for cities and regions accordingly. Beyond this, theoretical research insights are expected to help build an overall model that would bring together both aspects—innovation and inclusion—and the interface between them. This model, writing in the Theory of Change method (TOC), will help expand the spatial base of economic activity. The spatial dimension of the area, which focuses on the Negev region and its unique conditions, will allow local decision makers to cull in-depth knowledge updates that could encourage them to design advanced policies. I have years of experience promoting research-based policy in the Negev and wrote two policy papers based on my doctoral research. Specifically, these papers addressed an innovation district establishment in Beersheba. Many of the recommendations were in fact adopted, with some even implemented in practice. I have already connected with relevant stakeholders, and they are willing to send a letter of support for this research.

#### 4. Research Method

Data will be gathered from different sources including:

- Semi-structured interviews with stakeholders in different sectors (a total of 30)
- A systematic review of the players' written plans
- Descriptive and spatial data about the cluster, region, and population
- Global policy lesson benchmarks (on an optional basis)

Data will be analyzed within the framework of the *Theory of Change (TOC)* in order to provide the stakeholders with insights about further action required to build an ecosystem for innovation (by public policy measures) and inclusion (by impact investment ecosystems). The TOC framework is suitable, as it serves as a 'roadmap' for the initial goal. The model identifies long-term goals and identifies outcomes that must be in place to meet those goals, accordingly.

#### 5. Detailed Work Plan: Milestone Timetable (By Months)

Phase	Milestone	1-3	4-6	7-9	10-12
1	Conducting academic literature review				
2	Formulating questionnaires and interviews				
3	Gathering descriptive and spatial data				
4	Reviewing optional benchmarks				
5	Conducting in-depth interviews				
6	Reviewing stakeholder plans				
7	Analyzing interviews and writing the report				

#### 6. Budget

The entire budget is set to be allocated as a researcher scholarship.

# Shaul Hartal

## Personal details

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*Languages:* Hebrew - Native, English - Reading and Writing: Full Professional Proficiency, Spoken: Professional Working.

## Education

*2020-2021:* (Remote) Post-doctoral research under the guidance of Prof. Peter Nijkamp and Prof. Karima Kourtit, in the field of Regional Resilience and labor markets. The Open University of the Netherland.

*2015-2021:* PhD in Public Policy and Management, Ben Gurion University of the Negev, Supervisors: Prof. Miki Malul and Dr. Ofir Rubin, Dissertation Title: Internal Migration of Young Adults: The Negev as a Case Study. Dissertation submitted.

*2012-2015:* MA in Public Policy and Management, Ben Gurion University of the Negev, supervisors: Prof. Miki Malul and Dr. Ofir Rubin.

*1998-2001:* B.A. in Integrated Studies in Social Sciences, Bar Ilan University

## Professional Experience

*October 2020 – Current*

Lecturer for Public Policy for MBA students at Ono Academic College.

Researcher Medina L'mofet, an initiative of Or Movement for creating a disruptive future-vision of the Israeli labor market.

*February 2015 – October 2020*

Ph.D. student with a full scholarship, Department of Public Policy & Management, Ben-Gurion University of the Negev, Beer Sheva, Israel.

Researcher in joint research with the Samuel Neeman Institute in the Technion. "It Takes Two to Tango? Spatial and Social Implications of Joint Civil-Military Development." Research grant by the Israeli Ministry of Science & Technology (2015-2017).

Instructor: "The Regional Development and the Government's Role" and "Public Policy," M.A. courses at Ben-Gurion University (Since October 2016).

Advisor for Eastern Negev Cluster (on a volunteer basis, since 2017).

## Teaching

*2016-Present:* List of courses: "The Regional Development and the Government's Role" and "Public Policy," M.A. courses at Ben-Gurion University.

## Military Service

Full military service in 8200 unit.

## Honors and Awards

- 2019 – Dean's Award Winner for 2019.
- 2019 – The European Regional Science Association (ERSA), The Israeli section, Award for best paper in regional studies of Ph.D. candidates.
- 2018 - The European Regional Science Association (ERSA), The Israeli section, Award for second place in a presentation of a paper on poster competitions.
- 2017 Ministry of Science and Technology, the Yuval Neaman Scholarship.
- 2016 Kreitman School of Advanced Graduate Studies, the Negev Scholarship.
- 2015 Faculty Scholarship, Ben Gurion University for Ph.D. students.
- 2014 Graduated M.A. with honors.
- 2013 The Yad Tabenkin Foundation for Research, a scholarship.
- 2013 Faculty Scholarship, Ben Gurion University for M.A. students

## Publications

### *Published in Peer Review Journals*

1. **Hartal, S.**, Rubin, O. D., & Malul, M. (2021). The mobility preferences of ICT knowledge workers: Do second-ranked cities have a chance of attracting them? *Journal of Urban Affairs*, 1-15 (Impact factor of 0.97, rated 25 out of 200 in SJR in the category of Urban Studies, Q1).

2. **Hartal, S.**, Malul, M., & Rubin, O. D. (2017). The Role of Coordination Failure in the Movement of Future Knowledge Workers Away from the Periphery. *Cities*, 64, 18-25 (Impact factor of 1.77, rated 6 out of 200 in SJR in the category of Urban Studies, Q1).

#### *Submitted to Peer Review Journals*

1. **Hartal, S.**, Kourtit, K. "Spatial Labour Markets and Resilience of Cities and Regions: A Critical Review", Introductory paper to special session on 'The Tidal Movements of Spatial Labour Markets: Perturbation and Resilience' in *Regional Studies (in R&R)* (Impact factor of 1.84, rated 22 out of 540 in SJR in the category of Social Science, Q1).

#### *Scientific reports and technical papers*

- **Shaul. H.**, et al., *The Disruptive Future-Vision of the Israeli Labor Market*, Beer Sheva Israel, Or Movement, 2020.
- **Shaul. H.**, *Beer Sheva's Innovation District*, Beer Sheva Israel: Ben Gurion University of the Negev, 2020 (as part of the requirement for Yuval Neamen scholarship, Ministry of Science and Technology)
- Reuven, G., Malul, M., Rubin, O., **Hartal, S.**, Israel, E., Leck, E. *It Takes Two to Tango? Spatial and Social Implications of Joint Civil-Military Development*. Hifa Israel: Samuel Neaman Institute, 2017.

#### *Presentation at conferences, workshops, and seminars*

- "Overcoming the Coordination Failure in the Negev." The European Regional Science Association (ERSA) – The Israeli section, Technion Institute of Technology, 2015.
- "Overcoming the Coordination Failure in the Negev." ESPAnet ISRAEL 2015, Ben-Gurion University of the Negev, Israel July 2015.
- "Handling Factors Affecting Willingness to Pay through Creating Homogeneous Groups." ERSAs Congress in Lisbon, Portugal, August 2015.
- "Internal Migration of the Creative Class," the Sixth Annual Graduate Conference in Political Science, Public Policy, the Hebrew University, November 2015.
- "The Internal Migration of the Creative Class." ERSAs Summer School 2016 in Milano.
- "The Internal Migration of the Creative Class: The Negev as a Case Study." ERSAs – The Israeli section 2015 Congress, Western Galil College, Israel, February 2017.



- "Internal migration of the creative class: The Case of the Emerging Cyber Industry of Israel." ERSA Congress, special session, August 2017, Groningen, Netherlands.
- "Internal Migration of the Creative Class from Global Cities to Second-ranked Cities." ERSA Congress, the Israeli section, February 2018, Beer Sheba.
- "Beer Sheba and the Desired Lifestyle of Young Technological Career Soldiers," Roundtable for policymakers: Ben Gurion University, March 2018.
- "A Summary of Combined Civil-military Residential Preferences Survey." A seminar organized by the Department of Geography at Ben Gurion University and Mandel Center for Leadership in the Negev, January 2018.
- "The Residential Choice Location of the Talents," ERSA, Cork, Ireland, 2018.
- "Internal Migration of the Knowledge-workers: the Case of the Emerging Cyber Industry in the Southern Periphery of Israel," the fifth Global Entrepreneurship and Innovation conference, University of Amsterdam, Netherlands, October 2018.
- "Do Medium-sized Cities have a Chance to Become the 'Next Silicon Valley?'" Workshop in Institutional Analysis, Ronald Coase Institute (RCI), Bratislava, Slovakia, December 2018.

## Other Noteworthy Activities

During my eight years of studying for my M.A. and Ph.D., I've tried to make an impact on the development of the Negev region through communicate the results of my academic research to policymakers. I have written two policy papers for the Israeli Minister of Science & Technology and met with many policymakers, to promote the innovation district of Beer Sheva, a project in which I have been involved in from the first steps. Moreover, I was voluntarily engaged as an advisor to the communities in East Negev Cluster, trying to promote employment in the region, firstly as a volunteer and after that as part of a scholarship.