


**Review Article**

## Scientific Research and Higher Education as A Lever for Bottom-Up Regional Development-The Case of The Upper Galilee, Israel

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### Abstract

The Upper Galilee, a region known for its historical significance and cultural heritage, has long been a focal point for pioneering efforts. The spirit of resilience and innovation, deeply rooted in the region since events like the Battle of Tel Hai in 1920, continues to shape regional development. This paper explores the role of higher education and scientific research as catalysts for regional development in the Upper Galilee, Israel. Through local initiatives like Tel Hai Academic College and MIGAL Galilee Research Institute, the region has transitioned into a nationally recognized hub for academic excellence and economic growth. This case study demonstrates how regional bottom-up innovation, combined with gradual national support, has driven sustainable regional transformation. The guiding principle of leveraging scientific advancement and higher education as catalysts for sustainable growth of the region has proven to be correct.

### Introduction - Formulating the course of action

Community leaders of the Upper Galilee (Northern Israel), in everything related to the development of this region, engraved on their flag the slogan "We will do and hear." That is, they did what they could and expected national support along the way. This approach was rooted in a spirit of self-reliance and local initiative, characteristic of the early settlement efforts in Palestine [1]. As an early historical precedent for such an activity format, the settlement of Tel Hai by a group of pioneers who defended it with great difficulty can be noted. It was only after the famous battle in 1920 that it was recognized as a site of national importance. Only then this "Alamo" of Israel became a defining symbol of steadfastness, an example of a firm stand contributing to the determination of Israel's northern border [1]. The battle, which became a symbol of resilience and sacrifice, played a crucial role in shaping the narrative of the region [1].

### Early initiatives

During the British Mandate in Palestine, the settlements in the Upper Galilee were organized within the framework of a "Regional Committee" which represented them and provided essential services. The committee was also active in protecting the settlements and supporting illegal immigration operations through the borders of Syria and Lebanon [1]. The Regional Committee's role in coordinating resources and aiding illegal immigration is well-documented in the literature on Jewish settlement during the British Mandate period [1]. Likewise, with the establishment of the State of Israel, the leaders of the Upper Galilee Regional Council (the successor of this committee) were harnessed to national tasks, including participation in

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founding the cities of Kiryat Shmona and Hazor, as measures to develop the Galilee region and accommodate the influx of new immigrants. The shift from regional to national tasks, is part of a broader narrative of post-1948 Israeli settlement policies [2].

### The establishment of Tel Hai College

In keeping with this spirit, leaders of the Upper Galilee Regional Council initiated the establishment of Tel Hai College in 1951. The college was founded to provide residents of this remote peripheral region with access to higher education, which was otherwise only available in central Israel. The establishment of regional colleges in peripheral areas of Israel, during the early years of the state's existence, has made higher education accessible to residents of these areas [3]. For the next decades, accessibility to higher education opportunities was provided to the students of the Upper Galilee without migrating to the center of the country. It is important to emphasize that regional colleges were not authorized to award academic degrees. Some of the courses were in cooperation with a university and the instruction for the degree were under the auspices of the university. To complete the degree, students had to transfer to study at the university [3].

### The establishment of MIGAL – Galilee Research Institute

Similarly, MIGAL - Galilee Research Institute was established by the Regional Council's leaders, through a combination of strategic vision and exploitation of opportunities. The goal was to create a scientific research institute that would support higher education and contribute to the development of sophisticated agriculture and advanced industry toward economic and social regional development [4]. The Upper Galilee Regional Council initiated the establishment of MIGAL between 1977 and 1979 [4]. At the time, the council operated two agricultural research farms dedicated to orchards and field crops and supported regional researchers from the national agricultural research organization. It also ran a soil and water analysis laboratory known as the "Field Service," which provided professional support to local farmers in collaboration with the Ministry of Agriculture's extension service [4]. This background in agricultural research made it possible to lay the foundations for the creation of a research institute [4]. In 1977, the chief scientist of the Ministry of Agriculture approached the regional council and proposed establishing a peripheral agricultural R&D center to assist the new rural settlers of the Galilee [4]. It was agreed that the Upper Galilee Regional Council, with its managerial expertise, would oversee the center's establishment and operations, while the Ministry provided funding and professional guidance, and the North R&D center was established [5].

That same year, the Ministry of energy decided to conduct a feasibility study to assess the potential use of Lignite (the deep peat) from the Upper Galilee Hula Valley as an energy source for a power plant [6]. The plan was (as is customary in such sites in the world) to build the power plant near the lignite mine in the Hula valley. A delegation from the Galilee visited such open lignite mines and power plants in Germany. The members were impressed by the large-scale operations but also noted significant environmental concerns of possible pollution the project could bring to the Galilee. Therefore, it was decided to carry out a feasibility study that would include comprehensive research to examine the following: The quantities of lignite in Hula, its quality (calorific value), and the set of environmental consequences that the operation of the mine and the power plant would have. On the results of these studies, it would be possible to assess the feasibility of Lignite Utilization for energy production [7]. The regional council leaders did not oppose the study but insisted on a thorough environmental impact assessment if a mine and power station were built [4]. They also demanded that the analysis laboratory be established in cooperation with the Upper Galilee Council. As a result, the council was tasked with overseeing the establishment and operation of the laboratory, which would operate in accordance with the instructions of the Ministry of Energy. This laboratory was established in the city of Kiryat Shmona and called MIGAL – Galilee Research Institute [7]. The council rented a building, and the conversion of the building into a laboratory and the purchase of all the furniture and equipment were done with the dedicated funding of the lignite survey [7]. After one year of the project's operation, a comprehensive annual report concluded that utilizing Hula Lignite for power generation was not viable due to environmental and economic concerns [8]. Consequently, the project was halted. However, the regional council was left with a laboratory, which had been planned as a basis for a research institute, and its research team, without employment opportunities in designated projects. The regional council leaders decided to try to find other research and development opportunities for the institute [4].

At the same time, The Galilee Development Company, the holding company of the Upper Galilee Kibbutz settlements, managed and operated factories processing agricultural produce and supplied services for the agricultural industry, such as cold storage and packing houses. Such companies were established by kibbutzim in regions of Israel to work together in areas that are difficult for each kibbutz to handle separately [9,10]. As part of these services the Galilee Development company approached the Regional Council with a proposal to establish chemistry and microbiology analytical laboratories that would serve the needs of the regional agriculture and food industries. The Galilee Development Company's board approved the establishment of these laboratories and as part of

MIGAL. Since MIGAL Research Institute had already been established, it was decided to transfer the North agricultural R&D from the regional council to the new MIGAL research institute. This is how the MIGAL Institute, which integrated agricultural R&D on various topics important to the region alongside chemistry and microbiology laboratories for commercial services and research, was created [11].

### Further development of MIGAL institute

Over the next years, MIGAL began recruiting researchers. A unique employment model emerged when Tel Hai College sought to hire faculty members but could only afford part-time positions. Candidates who also wished to engage in research were jointly employed by MIGAL as researchers and by Tel Hai as lecturers. This model fostered collaboration between the research institute and the college, creating an integrated framework for research and teaching [11]. Over the following years, MIGAL's research areas developed and included agriculture, food, nutrition, environmental science, and health. The scientists were organized into four departments: biotechnology, nutrition and natural materials, plant sciences, and agriculture and the environment [11]. An important step in establishing MIGAL was the recognition of the institute by the Ministry of Science. This recognition followed the decision by this ministry to support regional scientific research institutes as a means of strengthening the periphery. MIGAL Research Institute was the first to be supported by the government in this framework, and following it, more institutes were established in additional peripheral areas [11].

### The establishment of Tel Hai Academic College

In 1993, the government of Israel decided to establish a new model of academic institutions: Independent academic colleges [12]. Tel Hai College was among the first to establish a separate association, "Tel Hai Academic College," which rapidly grew due to its ability to absorb students and grant them academic degrees in the Upper Galilee. Students from the region and across the country came to study and live in this picturesque area. A particularly significant development was the establishment of the Faculty of Science and Technology, an initiative led largely by MIGAL researchers [13]. The faculty's first department was the Department of Biotechnology, which became the first of its kind in the Israeli academic system. Despite initial skepticism from senior scientists regarding the establishment of a biotechnology department for a bachelor's degree. MIGAL scientists successfully argued for its importance, convincing the Council of Higher Education to support its creation. Additional academic departments in food, nutrition, computers, zoology, environment, and water were later established under this faculty, with hundreds of B.Sc. and M.Sc. students. These students conduct research at MIGAL laboratories under the guidance of MIGAL

scientists, who are also their college teachers. A special affiliation agreement between Tel Hai College and MIGAL allowed MIGAL researchers to serve as faculty members at the college, creating a unique cooperative model not found in other Israeli academic colleges [13].

### Applied achievements

In 2017, the Israeli government launched an economic development initiative for the Northern District. The government decision included the statement: "Among the decision-makers, the understanding is that effective policy should be based, as much as possible, on existing growth engines and relative regional advantages" [14]. Based on MIGAL and Tel Hai College's (the "growth engines") foundations, the government prioritized research and development to advance sophisticated agriculture, food, and nutrition industries in the region. Following this, several actions with government support have been launched to transform the Upper Galilee into Israel's "Food-Tech Valley," including the establishment of an Agri-Tech and Food-Tech incubator ("Fresh- Start"), a startup promotion center (Margalit Startup City), and an industrial zone for companies in these fields in the city of Kiryat Shmona. A National Food Institute at Tel Hai College, created in partnership with MIGAL and private entrepreneurs, has also received substantial government investment [14].

Today, the influence of the institute and the college is evident and is reflected in their being a major player in the regional ecosystem: the "Food-Tech Valley" of Israel. All the parties mentioned here are members of this regional management for the development of the region, along with the relevant local municipal authorities and government ministries. In this framework MIGAL research Institute brings about significant scientific achievements in its fields of activity. At MIGAL, groundbreaking research is being conducted that leads to the growth of new companies and significant economic activity in the periphery. In the last years, MIGAL has been responsible also for transferring many projects and technology to industries, and dozens of research collaborations with companies and startups. With its current scope of activity, the institute constitutes a very promising and significant growth engine for the economic development of the Upper Galilee and is one of the largest employers in the region. There is a consensus that this is a success story, which strengthens Israeli science and the periphery alike [15].

### Academic achievements

In 2022, the Council for Higher Education of Israel decided to form a committee to examine the location and mode for the establishment of a new university in the Galilee. After evaluating the six academic colleges in the region, the committee's recommendations report stated: "After examining all alternatives, the only alternative that

seems suitable to the committee members for establishing the university in the Galilee is at Tel Hai Academic College, subject to the full merger of the MIGAL Research Institute within the university" [16]. The committee highlighted that: "The academic management at MIGAL operates well and is properly controlled, and researchers who win competitive research grants are evaluated and promoted accordingly".

Furthermore, the committee emphasized that: "The working relationships between the researchers at MIGAL are good, and they cooperate with each other, confirming MIGAL's growing role as an engine for regional economic development. The research work at the institute, which combines applied perspectives with professional leadership from R&D and business development personnel, has made it a significant contributor to regional development ". Based on these recommendations, the Council for Higher Education approved the plan for the establishment of the Galilee University at Tel Hai college incorporating MIGAL Research Institute within the university [16]. In May 2024, the Minister of Education, who is the chairman of the Council for Higher Education, announced that the establishment of the University of the Galilee will be in Kiryat Shmona and Tel Hai [17]. Later (February 2025) the Government of Israel decided: "A historic decision to stimulate the activity and development of the Tel Hai Academic College, with the aim of bringing about official recognition of the institution as the University of Kiryat Shmona in the Galilee. The establishment of the new university in Kiryat Shmona and Tel Hai is a strategic step to develop and strengthen the city and the entire Eastern Galilee region. This is a significant move to strengthen higher education and the future of Galilee" [18].

## Discussion

The development of a peripheral region can be carried out because of a government decision to promote an area vital to the state, or as a successful local initiative that later receives national support [1]. The choice of scientific research and higher education as a means for the development of the Upper Galilee was a local initiative of the leaders and residents of the region. State support for the promotion of these means came gradually. At each stage, there was an initiative from the people of the region and later support was received from national sources [4]. Thus, in promoting higher education, the establishment of the Tel Hai Regional College was the basis from which, Tel Hai Academic College later developed [12]. In the establishment of MIGAL Research Institute, the region's vision was to establish a regional research institute. Opportunities were seized in establishing the institute based on the first Lignite research laboratories and the regional agricultural R&D unit established with the Ministries of Agriculture and Energy [5,7]. The important support of the Ministry of Science for research institutes in the periphery enabled the continued significant development of the institute

[11]. The special relationship between the MIGAL Research Institute and the Tel Hai Academic College made possible establishment of the Faculty of Science and Technology [13]. Subsequently an affiliation agreement was signed between MIGAL and the college, under which MIGAL researchers are also faculty members at the college. This framework, based on local initiatives, led to recent national decisions in the fields of higher education and economic development of the Galilee. These decisions include the establishment of the University of Galilee in Kiryat Shmona and Tel Hai based on these two institutions. At the same time, regional industrial/economic development in the fields of agriculture, food, and nutrition based on the scientific/applied capacity of both institutions [14,18]. In this way, the goals of the region's residents for development based on scientific research and higher education were achieved, even though state support was obtained in stages and took a long time.

## Conclusions

The Upper Galilee's experience demonstrates that regional development can be successfully driven by local initiatives in higher education and research. The case of MIGAL and Tel Hai College illustrates how strategic, community-led efforts—when combined with eventual national support—can transform a peripheral region into a thriving academic and economic hub. This model could serve as an inspiration for other regions seeking sustainable growth.

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