

OECD Review of Higher Education in Regional and
City Development

The Galilee, Israel



Assessment and recommendations

The Galilee: from talent attraction to nurturing endogenous assets

Israel has enjoyed high economic growth rates supported by entrepreneurial drive. Israeli society has also absorbed and integrated immigrants from 79 different countries, who speak 39 languages.

However, there is a growing social and economic divide within Israel between the centre and periphery – the Galilee and the Negev – and between different population groups. The socio-economic gap is evidenced in the rate of unemployment, the low level of salaries, the lack of absorptive capacity in traditional industries, negative migration, poverty which is highest among the youngest and most rapidly growing population groups, and the fundamental disparity between the Arab and Jewish populations groups. The uneven development poses a threat to long-term sustainable development of Israel.

The Galilee is located in the northern-most part of Israel. The regional economy is dominated by traditional sector such as agriculture, construction and manufacturing. The region is to a large extent characterised by a low skills/low wage economy. One third of the population – Haifa sub-districts excluded – live below the poverty line. The unemployment rate is higher than the national average and average wages lower for both the self employed and salaried employed. There is a high degree of diversity of ethnicity and religion and a separation of different population groups.

The Arab population continues to face structural obstacles and constraints in entering higher education and labour market. The gaps in educational attainment are particularly noticeable in the Northern part where

the share of Arab population is closer to 50% against 20% in the country as a whole. The disparities in education outcomes generate income inequalities and result in a waste of talent for the economy. At the same time, the current underinvestment in human capital represents a considerable untapped resource for the Israeli society.

In the context of low skills, ethnic and religious diversity and globalisation, the key challenges for the Galilee and its higher education institutions are the following:

- How to fuel local growth by developing relevant skills and improving educational attainment level across the multi-ethnic, multi-religious population?
- How to leverage the current economic base and promote new business formation?
- How to mobilise higher education institutions for regional and local development and boost collaboration between institutions?

In order to address these challenges, Israel needs to establish long-term measurable goals for narrowing gaps between key populations. It should widen access to education by ensuring equitable education infrastructure and quality service delivery to all population groups. Increasing the accessibility of tertiary education among underrepresented groups will also require a structural change in tertiary education to improve vocational education opportunities. Regional engagement and sustainability should be guaranteed by appropriate incentives structures for higher education institutions and their faculty.

Furthermore, the Galilee needs more concerted efforts and an approach to regional development including a master plan with vision, goals, milestones, co-ordination measures and robust evidence base. The good practice examples currently seen within the region in widening access to higher education, community engagement and industry-university collaboration should be disseminated, extended and scaled up. Employability, creating jobs and providing access to employment opportunities should be seen as the primary goals of innovation and human capital development. In addition, higher education institutions should move towards more demand-led education provision and use the region as a “laboratory” for students’ learning and challenge-driven research and community outreach.

Human capital development in the Galilee

Israel has a high average educational attainment level but significant differences between population groups. Low outcomes in education are concentrated among the fastest growing Arab and ultra-Orthodox Jewish populations. Half of the age cohort fails to achieve qualifications to access higher education. In the absence of substantial changes, by 2020 a significant number of new workers will enter the Israeli labour force without relevant skills.

The Israeli population has a high average level of educational attainment across all age groups. About 43% of the 25-34-year olds and 45% of the 45-54-year olds have completed tertiary education (OECD Education at Glance, 2011). The 1993 Council of Higher Education Master Plan doubled the share of first-year students from 23% of the age cohort to 43% in 2008. An additional 12% were enrolled in tertiary education towards associate degrees in 2009. The number of higher education institutions grew from 21 in 1990 to 66 in 2009. Private returns on education are, on average, at a high level: in 2007 gross average income of academic professionals was NIS 12 672, compared with NIS 7 374 for those with 9-12 years of education. However, returns on education for Arabs are considerably lower.

Much of the expansion in higher education has been achieved through the establishment of colleges which offer undergraduate education. The number of students in the colleges in the periphery has increased considerably: the percentage of undergraduates studying in institutions in the Northern and Southern Regions grew from 8.7% in 1990 to 22.7% in 2006. This increase was at the expense of the three metropolitan regions of Jerusalem, Tel-Aviv and Haifa, whose share in the student population went down from 87.2% to 60.7%.

Despite this progress, significant differences remain in educational outcomes between population groups. Low levels of educational attainment are concentrated among the fastest growing Arab and ultra-Orthodox Jewish populations. While the opening of colleges in the periphery has increased the access of the Arab population, particularly for women, the overall participation and attainment levels still lag behind: only about 20% of Arab population aged 15 and over has attained tertiary education, compared to 45% in the Jewish population. Furthermore, the share of first-degree graduates from low-income households is small, even taking consideration the differences in secondary education grades.

The Israeli education system is characterised by segregation. Pre-primary, primary and secondary education in Israel consists of four main streams: Hebrew speaking schools that include state, state-religious and ultra-Orthodox Jewish schools, the Arab-speaking stream and a small stream for the Druze. All streams are supervised and fully funded by the state, apart from the ultra-Orthodox stream which is independent but receives state funding.

Israeli students in secondary schools perform poorly in international student tests, such as the OECD's programme for International Student Assessment (PISA). While poor international ranking in PISA is evident in all streams of supervised education, the Arab schools have the lowest scores of all. While the most recent PISA results show some improvement, the science and math scores have declined. Modest learning outcomes can be partly explained by low levels of public spending on education per student in Israel. Furthermore, budgetary spending per child (0-17 years) in Arab localities is only half of that of in Jewish communities. Arab primary and lower secondary schools have bigger classes and fewer teaching hours: in elementary Arab schools teaching hours are about 75% of those in Jewish schools. In ultra-Orthodox schools the challenge is not so much the time but the content of education which provides limited skills for the labour market.

Entrance to higher education is complicated, depending not only on the matriculation test (Bagrut), but also on a separate aptitude test (psychometric test). There is some evidence of cultural bias in these tests and significant differences between Jewish and Arab students. About half of the age cohort fails to receive qualifications that would enable access to higher education. Vocational education remains underdeveloped.

Military conscription delays entry to tertiary education or work but provides practical skills with market value to the Jewish population, apart from the ultra-Orthodox Jews who are in practice exempt from the military service. Conscripts benefit from army discharge grants and support to enter higher education. Equivalent post-school support should be made available to Arab students. Military conscription has also contributed to the development of wide array of pre-academic programmes.

Poor learning outcomes and low educational attainment levels for minority groups reflect the failure of the Israeli education system at all levels. Authorities are aware of the discrepancies, and have started to increase investment. In primary and secondary education over the 2007-11 period, 8 000 new classrooms are scheduled to be built and subsidised, of which 40% are for the benefit of the minority populations. The New Horizon educational reform has been launched to address quality and equity gaps and to improve the preparation of school teachers. In higher education

a substantive reform programme was started in 2008, based on the SHOCHAT committee recommendations, but ground to a halt before the end of the year. While the higher education reform is now being revived with a six-year plan, policy needs to ensure that financial constraints do not act as a barrier to higher education. Sustained investment is needed to address the long-term shortcomings of the Arab population.

Low educational attainment levels limit the ability of the Galilee to develop and attract high-value economic opportunities. In recent years considerable progress has been made in widening access to higher education in the Galilee through the establishment of colleges. Despite the progress, higher education attainment levels continue to lag behind the national average and the enrolment of the colleges remains largely Jewish.

In the Galilee the access to higher education has improved significantly: in 1990, there were no accredited institutions authorised to grant academic degrees in the region, whereas in 2008 the region had 8.5% of the total number of students in Israel. A number of new colleges have been established to improve access to higher education. Nevertheless, the higher education attainment levels (associates degree and above) in the region lag behind the national averages and about 57% of the Galilee civilian workforce obtain only 12 years or less of schooling. The average net income in the Galilee is 47% less than in the centre of Israel. Unemployment rates are higher, particularly among Arab women (22.7% compared with the national average of 13.1%).

Educational outcomes of the Arabs population, who represent almost 50% of the population in the Galilee, are improving, but still lag behind those of the Jewish population even in the younger cohorts. The enrolments of the Galilee colleges remain largely Jewish, ranging from 65% to 70% at Gordon College of Education and Western Galilee College to more than 90% at ORT Braude. The low enrolment rates of Arabs can be attributed to the limited supply of relevant places, poor geographical accessibility to higher education, poor preparation at the primary and secondary education level due to underinvestment in Arab schools, insufficient language skills and lower rates of return to education for Arab population.

A systematic region-wide approach is needed to widening access to and improving retention in higher education. This calls for improved preparation for higher education through investment in schools, sustained collaboration between schools and higher education institutions, and measurable targets for colleges for enrolment and graduation rates of minority students.

To ensure sustainable development in the region, a higher percentage of the Arab population should be able to complete secondary education with the knowledge and skills needed for tertiary education and a knowledge-based economy. Higher education institutions could play a more prominent role in supporting the school reform. The ongoing initiatives in the Galilee include: *i)* greater focus on teacher preparation, including professional development of school principals and teachers, *ii)* increase in enrolment in pre-academic programmes for under-represented population groups, including programmes to improve proficiency in Hebrew and *iii)* targeting student community service for the underserved communities and schools. Extensive college engagement occurs through student community service and volunteer programmes, for example the Perach programme which engages students from all Israeli higher education institutions with children from disadvantaged socio-economic background in raising aspirations. The eight Perach programmes in operation in the Galilee involve approximately 1 000 higher education students.

Despite programmes, projects and initiatives in the Galilee, there is no systematic region-wide approach to widening access to and improving retention rates in higher education. The authorities need to address these challenges in the periphery in a comprehensive way and mobilise appropriate levels of financial resources to support public education at all levels and for all population groups. Measureable targets should be set for higher education institutions regarding the enrolment and graduation rates of the minority groups. Institution-wide measures should be adopted to improve the retention rates of the first generation students. There is also a need to increase the outreach efforts of the higher education institutions and share good practices among themselves in a systematic manner.

Improvements should also be made in the geographical accessibility of tertiary education. The existing Arab colleges should be strengthened and allowed to diversify their

teaching, research and service portfolio to better respond to the needs of the region. Collaboration between higher education institutions should be encouraged to develop local solutions to regional provision through partnerships, to improve student mobility and pathways as well as a more cost-effective delivery of academic programmes.

Many of the higher education institutions in the Galilee are geographically separated from predominantly Arab communities. The Academic Arab College for Education in Haifa, Sakhnin Academic College for Teacher Education and the Nazareth Academic Institution (NAI) serve primarily Arab students, but their capacity remains low due to the limitations in their missions and resources. For example the Sakhnin College is confined to teacher education with limited ability to respond to the regional needs and the newly established Nazareth Academic Institution (NAI) has a small offer of accredited courses and receives no budget funding. Considering the current underrepresentation of Arab population in tertiary education, steps should be taken to provide adequate support to NAI, which is the first comprehensive Arab higher education institution in Israel. Support should also be provided to the Arab academic colleges for education to help them to diversify their teaching portfolios. Investing in Arab education would improve education attainment levels and generate mid- to long-term benefits for the regional economy including increased tax revenues and job creation.

There is a need to design tertiary education based on the particular local needs. The authorities should support the provision of colleges on the basis of the current and projected demand in order to provide the growth (or reduction) of services in locations where it is required. A region-wide assessment of current and planned capacity should be conducted against anticipated student numbers, identifying needs in terms of staff and infrastructure and taking into account related transport and student housing provision. In some cases, there is a need to enhance infrastructure-sharing arrangements between different education providers. When developing the network of higher education institutions, care should be taken to ensure that adequate IT infrastructure is in place for high speed, low cost connectivity.

Smaller colleges may suffer from increased costs associated with the small scale of operations, relatively low student numbers and a high proportion of students from disadvantaged socio-economic background. Therefore, strong collaborative links need to be developed between the colleges to improve their education, service and research capacity. Additional funding should be allocated to develop collaborative, local

solutions to regional provision through partnerships with local stakeholders. Authorities could consider providing support for specific higher education extension learning centres served by several different colleges and possibly universities and the Open University, in villages with low tertiary education participation rates.

There is limited student mobility among higher education institutions in the Galilee. Reported reasons were the competition among institutions for a limited pool of students and the lack of a credit transfer system. Higher education policy in Israel emphasises the objectives of differentiating the missions of institutions and discouraging unnecessary programme duplication. As a complement to these policies, there is a need for policies that provide pathways for students to move between and among institutions to take advantage of academic programmes that may not be available at their college of initial enrolment.

The Galilee provides an opportunity for Israel to enhance institutional collaboration so that the combined capacity of the colleges can contribute to more cost-effective delivery of academic programmes in the region. The authorities could pilot a credit transfer system that would make it possible for students at the colleges in the Galilee to transfer to another college to take advantage of an academic programme without the loss of academic standing or progress. When approving a new academic programme, the authorities could require that an institution provides pathways for students at other colleges in the region to transfer to the programme and to transfer credits for course work already completed. Priority could be given to academic programmes in fields in demand within the region such as the health professions or tourism/ hospitality. Changes in finance policy would be important to make such a transfer policy work. For example, both the sending and receiving institutions should not be penalised in the funding formulae of the Planning and Budgeting Committee (PBC) because of the loss or gain in enrolment resulting from student transfers. The authorities could also provide funding to support joint academic programme planning between the faculties of two or more colleges to facilitate student credit transfer.

The ability to fuel local growth by cultivating relevant skills is the best guarantee that the Galilee will thrive in future. Currently, there is a mismatch between the higher education supply and demand. Strengthening vocational education for Arab men and providing wider learning opportunities for women are necessary.

Employment by industry and occupation in the Galilee differs from other regions of Israel with higher levels of employment in traditional industries and lower levels of employment in occupations that commonly require education at the tertiary level. Employment patterns are different for Jews and Arabs, and within the Arab population, for men and women. A major challenge for the Galilee is to increase the labour market participation rate of Arabs. The participation rate of Arab women is very low and stagnant: only 17.8% in 2005, when in 1995 the rate was 18.3%. A majority of the Arab female employees (approximately 53%) work part-time, which partially explains the gap between the average wages of Arab women and Jewish women.

Currently, the academic programmes provided by the Galilee colleges do not appear to be well aligned with the demand for skills in the region. There is a lack of tertiary education opportunities relevant to labour market. The mismatch between higher education supply and demand is caused by a lack of vocational-technical programmes relevant to the employment of Arab men and narrow education and employment opportunities for Arab women.

Israeli education system has a strong emphasis on academic preparation for higher education and limited focus on developing the vocational skills needed by industry. While military conscription is a source of vocational skills for the Jewish population, this channel is not available to the Arabs. In order to reverse the decline in productivity of traditional industry in the Galilee there is a need for increased availability of education and training programmes at the level of certificate or associate degree (tertiary level B) particularly targeted at Arab men, who provide the core human resources for the region's traditional industries.

A small number of Arab women attending the academic colleges in the Galilee are enrolled in academic programmes other than teacher preparation. Opening wider educational opportunities for Arab women will ultimately impact on their labour market outcomes and generate positive results for the Israeli society. In addition to providing adequate support to the existing Arab colleges, the authorities should ensure wider use of ICTs, distance learning and teleworking opportunities in order to enhance women's participation in education and labour force.

To reduce the brain drain from the region the labour market relevance of tertiary education needs to be improved. Skills diversification and stronger Life Long Learning opportunities

would help adjustments to changes in the labour market.

Despite some notable exceptions, the higher education provision in the Galilee colleges remains supply- rather than demand-driven. Traditional lecture modes of instruction dominate and only a small proportion of students in a limited number of disciplines have access to work-based learning and internships. Limited efforts are made to integrate practical experience or voluntary service in the curricula. Only a few systematic programmes linking graduates in the regional industry are in place. Furthermore while higher education institutions expressed concern about the lack of employment opportunities for graduates within the region, many did not have robust institution-wide systems in place to monitor the labour market outcomes of their graduates. Considerable number of students engages in voluntary work. With the exception of the Tel Hai College, this is not credit-bearing and considered not part of the curricula.

Due to rapidly changing skill requirements and the entry of migrant workers to the Galilee labour market, Life Long Learning, skills upgrading and re-skilling are becoming increasingly important. Upgrading the skills of the adult population would also have a more direct effect on the region's economic performance since adult learners are generally less mobile than younger students due to family commitments. While much of the demand is in the vocational sector, the Galilee higher education institutions could play a more active role in Life Long Learning. Currently they are more oriented to meeting the needs of traditional students than those of the working age adults. For non-traditional learners, who combine work and study and/or family obligations, flexible ways of provision need to be in place through work-based, e-learning and distance education. In addition, attendance on the basis of non-formal and informal learning should be allowed.

The following measures would promote human capital development in the Galilee:

- Authorities, higher education institutions and other educational institutions and stakeholders of the economy and society should work together to establish a Regional Human Capital Development System to define region-wide goals, policies and priorities to improve the educational attainment rates and to bridge the gaps between the population gaps. Region-wide as well as institution-specific clear measurable targets should be set for enrolment, graduation and employment outcomes of the students, with quotas for underrepresented groups.

- Authorities and higher education institutions should work together to improve the data on labour market needs and trends and student access and progress. Higher education institutions should systematically monitor student progress, as well as students' labour market outcomes and graduate destinations. The most effective region-wide graduate labour market systems are based on comprehensive labour market intelligence, on-line publication of the data in a single place to improve students' ability to make rational choices about their studies and to help graduates and employers to come together and increases students chances of moving into employment; and using the data strategically to identify regional priorities and at an institutional level, to respond to the data in terms of course provision and the provision of employer-specific skills.
- Authorities and higher education institutions should continue to expand efforts to increase the enrolment of Arab students as well as the efforts to improve their completion rates. These efforts should build upon successful models of effective academic and social support services for students, increasing financial assistance to low income students, including both institutional and government aid.
- Authorities should conduct a region-wide assessment of current and planned capacity against required and anticipated student numbers and identify gaps in staff and infrastructure. Co-ordinated negotiation and planning process should be led by the authorities within the sub-regions. Support should be provided for extension learning centres that draw on a range of providers, including several colleges, possibly Open University and other universities, in villages with low tertiary education participation rates. When developing the network of education providers, care should be taken to ensure that the population continues to have access to adequate lifelong learning services. Adequate IT infrastructure should be put in place to ensure high speed, low cost connectivity.
- Authorities and higher education institutions should facilitate better matching between higher education supply and demand. They should make stronger efforts to improve education and employment opportunities for Arab women; to provide vocational-technical programmes relevant to the employment of Arab men; and to integrate regional engagement within the core teaching/learning and research missions of the higher education institutions. Efforts should be made to increase Arab faculty in the higher education institutions respecting the goals of the Civil Service Law.

- Authorities should encourage pathways for students between and among institutions to be provided in the Galilee through a pilot student credit transfer system and changes in finance policy to encourage institutional collaboration in promoting student mobility.
- Authorities and higher education institutions should take steps to significantly expand higher education opportunities for working age adults. These steps should create clear and transparent pathways to advanced education for adults, including the ability to attend multiple institutions, obtain short-term education and training that can later be applied to degrees, and re-skilling and up-skilling courses and programmes designed around the particular needs of adults who combine work and study.
- Higher education institutions should focus on the employability and entrepreneurial skills of graduates; providing them with the skills and competences needed in a globalised knowledge economy. Work- and problem-based learning methods and programmes to build entrepreneurship skills would improve retention rates and graduation rates in the region. Similarly, stronger efforts in language learning could help the region in its internationalisation efforts.

Innovation in the Galilee

Israel is one of the top performers in developing pro-innovation policies and generating innovations, particularly in the ICT sector. But the national innovation system is characterised by sectoral and geographical imbalances which have resulted in a double economy and regional disparities. Despite a broad array of RDI programmes, the national policies do not yet sufficiently support regional innovation systems.

Israel is one of the top performers in developing pro-innovation policies and generating innovations, particularly in the ICT sector where it has the first mover advantage in advanced R&D. In international comparisons Israel leads R&D spending compared to GDP and is the third largest supplier of NASDAQ listed companies after the United States and Canada. It has a highly developed venture capital market and a world record in terms of venture capital backed investment as a percentage of GDP. Israel ranks high

in terms of entrepreneurship outcomes and the angel business investment rate.

At the same time however, public support to academic R&D is at a low level and funds need to be funnelled towards research linked with the long-term priorities of the Israeli economy, including water, energy and health. There is evidence of brain drain and signs that Israel is losing ground as more and more countries are focusing on advanced R&D.

The national innovation system is also characterised by sectoral and geographical imbalances. In contrast to the OECD average of 20%, approximately 80% of Israeli R&D spending is concentrated on the ICT fields. These fields represent 15% of Israeli GDP but only 5% of employment. At the same time only 4% of government support to R&D is directed to traditional industry (2004 figures). While the Israeli ICT companies invest around 10% to 18% of their turnover in R&D, the corresponding figures for traditional industries are 0.1% to 3%. Less than 30% of business expenditure in R&D takes place in the periphery, the Galilee and the Negev.

The strong emphasis on high-tech fields, especially ICT, has resulted in a dual economy in Israel with significant income gaps and uneven development. Over-dependency on ICT makes the economy vulnerable to sudden changes and constrains the country's long-term balanced growth potential. There is a need to develop innovation and skills in traditional industries and public services that employ most of the population. Improvements in productivity and diversification in the productive base would require context-specific regional policies.

The Galilee is a peripheral region with a lack of dynamic clusters and a low level of applied R&D and innovation. The academic R&D assets are concentrated in the research-intensive universities in Haifa, but there are limited spillovers to the Galilee. The contribution of the colleges to the regional innovation is low due to the national policy that limits their capacity.

The Galilee economy is dominated by traditional sectors such as agriculture, construction and basic manufacturing, which are all under growing pressure in the global knowledge-based economy. High-tech industries are penetrating the Galilee, albeit at a slower pace than in the central region. Today, the Galilee is slowly developing a blend of low and

high-tech industries in plastic, machinery, agro-food, chemicals, ICT, optics, life sciences and pharmaceuticals.

The Galilee combines many of the characteristics of peripheral and old industrial regions which are less innovative in comparison to central and agglomerated regions. The key challenges include a lack of dynamic clusters and a low level of R&D and innovation due to the predominance of small and medium-sized enterprises (SMEs) in traditional sectors and/or branch plants with limited absorptive capacity. There is nascent innovation culture in the SMEs and a lack of tradition of collaboration between them. One consequence of this is a poor articulation of demand for services from the higher education institutions by the SME sector. The innovation support institutions have limited presence in the region. A number of science parks and incubators provide a basis for new economic development but in most cases, links with the higher education institutions are limited. Various forms of “lock-ins” are present in the region ranging from narrow orientation of knowledge providers, to a “low wage equilibrium” including low job creation. Population groups live and learn in separate communities limiting the innovation potential of a multi-cultural, multi-ethnic population.

The academic R&D assets are concentrated in the research-intensive universities in Haifa whose focus is global and national, rather than local and regional. The universities have developed mechanisms for engaging with business and industry by having dedicated offices for technology transfer and intellectual property but the links with the Galilee business and industry remain limited. The Technion would have the capacity to guide industry and innovation in the Galilee, but plays this role to a very limited extent. Some research projects driven by individual researchers or departments explore regional issues, for example in the social sciences, where the Galilee’s diverse demographic landscape makes it a unique social laboratory, as well as in urban planning, water management, transportation and other engineering disciplines.

Regionally oriented applied R&D could be undertaken in colleges, but remains at a modest level due to the lack of critical mass and national policy that limits the colleges’ ability to build capacity in knowledge transfer and industry collaboration. Some colleges have taken steps to build their capacity in this domain, most notably the Tel Hai Academic College and ORT Braude. Colleges see their role as regional change agents but deliver this role mainly through community service rather than applied R&D.

Support for innovation remains limited and fragmented within and among higher education institutions. There is no effective guidance system for business to identify where best to source support for innovation. There seems to be few attempts to connect up technologically-oriented centres

with business faculties and with other disciplines to provide support for service and industry. Collaboration between higher education institutions remains limited. There were few attempts to set out the collective needs of the region in terms of innovation infrastructure or for the academic colleges or universities to co-ordinate their actions in meeting such needs.

The fragmentation of the regional innovation system of the Galilee is a challenge for the sustainable development of Israel. There is a need to upgrade the existing traditional industry and service sector and improve their capacity for innovation.

Whilst efforts have been made by the national government and private investors to support the research infrastructure and attract talent from the centre to the Galilee, the connection with indigenous human capital development, innovation and business formation is not yet adequately developed. Investment from the national government focuses on the research components of the system and tax breaks for industry. The wide array of RDI programmes does not fully benefit the Galilee. Main emphasis is on science and technology-driven innovation, while the traditional industry is in need of support for incremental demand-led innovation which could be provided by colleges if they were encouraged to engage in applied R&D in the same way as in many OECD countries. There are limited spillovers from the centre to the Galilee and an absence of an underlying culture of collaboration. The national policy and the research universities emphasise academic excellence and global impact rather than regional needs. The lack of a recognised regional mission for higher education institutions which would include clear goals and a significant role for academic researchers and the college faculty is a weakness in the present higher education and innovation system. Furthermore, there is a lack of information and data on innovation performance within the private sector and also within higher education institutions. There has not been a detailed investigation into the nature of innovation within the firms in the north, the barriers and problems and the experiences of collaboration with higher education institutions. Policy seems to be developed in the absence of evidence about the region's needs.

More focused policies and incentives would drive stronger regional engagement by higher education institutions and academic researchers. The Galilee and its sub-regions would benefit for a strategy that has an emphasis on traditional industry which is engaged in R&D. There is a need to

encourage technological, marketing and organisational innovation in traditional industry and the service sector, for example through wider adoption of ICT. Focusing on challenge-driven research on water management, health and social issues could also provide positive outcomes for the region. A rebalancing of priorities would convey a clear message to the Technion, the University of Haifa and the academic colleges about the needs of the region for skilled human resources and for applied R&D. To be able to formulate and implement policy intervention and initiatives, authorities should also have robust data about the specificities of the regional innovation system in the Galilee and the factors undermining its development potential.

While Israel is ranked high on entrepreneurship, there are wide regional disparities in business creation. There is room for improvement in the contribution of colleges to business creation in the Galilee.

The Galilee suffers from brain drain, which suggests that finding ways to increase entrepreneurship could be an effective strategy for job creation and talent retention. While Israel is ranked high on entrepreneurship, there are wide regional disparities: in the periphery and notably in the Galilee, business creation is at a relatively low level.

There is considerable underutilised potential in the colleges in terms of business creation in the Galilee as well as evidence of students' interest in entrepreneurship and willingness to stay in the region. Today however, the Galilee colleges provide students with little practical experience of new venture formation. Where entrepreneurship teaching exists it is largely conventionally taught, rather than embedded in the curricula. International experience shows that the best support for graduate entrepreneurship often comes from teaching programmes where students work in teams to form real companies mentored by entrepreneurs. Such programmes can run at undergraduate and graduate levels and be targeted at students from across the sciences, engineering, business, social science and arts disciplines. None of the universities or colleges highlighted the existence of this type of programmes. Where enterprise support existed, it was fragmented with no real collaboration across higher education institutions in the region.

The following measures would promote regional innovation in the Galilee:

- Special regional innovation policy instrument should be created, for example in the form of a regional innovation fund. The Higher Education Innovation Fund (HEIF) model in the UK could serve as a source of inspiration (see Chapter 4). A strategy with emphasis on endogenous development of traditional industry that is engaged in R&D would better serve the region. Higher education institutions should be encouraged to draw upon business schools, humanities and social sciences in providing assistance to business.
- Considerable efforts should be made to develop general competencies among the population to help adjustments to rapid changes in the labour market and to facilitate lifelong learning. Systematic joint efforts should be made by the authorities, educational institutions and key stakeholders to raise the levels of education attainment, particularly among the Arab population. Authorities should provide adequate support for the existing Arab colleges and allow colleges of education to diversify their provision according to the needs of the local industry. Investing on Arab colleges would generate mid- to long-term benefits for the regional economy in the form of tax revenues and job creation. Technical and vocational education should be strengthened for the benefit of the regional industry and underrepresented groups.
- To improve productivity and innovation in traditional industry and services and to improve graduate retention, specific mobility programmes should be established to link the students, graduates, post-graduates and academic staff with the local business and industry in a more systematic way. Models for linking postgraduate students with the local industry include the Knowledge Transfer Partnership Scheme in the United Kingdom that has improved the competitiveness of the companies through introduction of some form of innovation or new technology and around 75% of postgraduate associates are offered jobs in the companies.
- The universities in Haifa should play a more active role in helping the Galilee to build a more robust economy based on knowledge and innovation. The universities and colleges should focus their concerted efforts on challenge-driven innovation on the key issues in the region, such as water, health and social challenges stemming from the multicultural population and use the region as a “laboratory” for research and knowledge transfer. Job creation should be seen as the focus of innovation activities in the Galilee. Technology Transfer Offices should be strengthened and organised at an arms length from the

university in order to be managed as a quasi market service reporting to the university but independent from it. Incentives for higher education institutions should be strengthened to increase their capacity to act as technology transfer “agents” to bring non-local knowledge to the region and to create community partnerships.

- Colleges should be allowed to build their applied R&D and innovation capacities for the benefit of the regional development in the Galilee. Incentives for higher education institutions and their staff to engage in local and regional development should be developed. The government should seek to encourage greater collaboration between higher education institutions through joint investments in R&D facilities and incentive programmes. The higher education institutions should also develop a practical engagement with business and a collaborative way of referring enquiries from businesses and industry with the help of virtual and face-to-face collaboration. Authorities should channel funds to enhance SME/business/college linkage and related applied research projects that would contribute to strengthen the Galilean innovation system. The RAAK procedure in Netherland is an example to consider.
- The higher education institutions should support entrepreneurship throughout the curriculum and build comprehensive support programmes encompassing entrepreneurship training, practical experience of creating new businesses for groups of students and incubation facilities together with seed funds for new graduate ventures. Finnish, German and US initiatives are examples that could be emulated.

Capacity building for regional development in the Galilee

There is a lack of strategic anchoring of regional engagement of higher education institutions in the Galilee and within the higher education system in Israel. Regional engagement is not embedded within the core tasks of the HEIs. Current higher education policies at the national and institutional level are not aligned with the goal of mobilising higher education for regional and city development.

Current regionally relevant activities by higher education institutions in the Galilee, including industry collaboration and widening access initiatives

are more the result of bottom-up processes and not fully reflected in higher education policy or institutional set-up. They remain limited in scope and impact. There are gaps in important areas such as lifelong learning, support for traditional industry and public services, and responding to the needs of the Arab population.

There is a lack of integration of regional engagement within the core teaching/learning, research and service missions of the Galilee colleges and a co-ordination deficit within institutions and the higher education system. Action is often dependent upon the commitment of individual staff or student volunteers, and not reflected in the strategic development, curriculum development or budget allocation of the higher education institution. Collaborative mechanisms among higher education institutions to build capacity and foster joint efforts for regional development remain limited. Modest resources are spread thinly and there is a lack of critical mass to generate projects which will have real impact at the local and regional level and also generate multiplier effects.

Furthermore, the system of information gathering about regional environment as well as success and failure of regional relevant activities by higher education institutions is limited in scope and quality. There is a lack of robust data particularly in the field of skills gaps, ethnic and socio-economic background of students, student progress, graduate employment, graduate destinations (outmigration), breadth and scope of work-based learning activities, business formation, the nature of innovation within firms, the barriers and problems and experiences of collaboration with higher education institutions which make it difficult to evaluate the outcomes of policies and institutional practices.

Current incentives for higher education institutions and their staff have an emphasis on academic excellence which is narrowly defined. Stronger incentives are needed to mobilise higher education institutions and their staff for local and regional development to provide regionally relevant education, R&D and service.

Incentive structures for mobilising research-intensive universities for regional and city development are limited in Israel. There is no explicit “third task” or regional development task assigned to them and regional engagement is left to the initiative of the individual institutions. The principal driver of research-intensive universities is scientific excellence and/or its applicability to business competitiveness wherever firms may be

located. While the colleges are building the R&D capacity from a low base, they are constrained by their limited capacity in terms of time and money to move in this direction. Policy emphasises strong demarcation between research intensive universities and colleges which provide undergraduate education.

The promotion and tenure criteria for faculty at the colleges in the Galilee is centrally administered through the Council of Higher Education (CHE) in which faculty from the universities play a key role. The criteria for promotion emphasise research and publication and not a broader definition which includes regional engagement. There is a need to widen the criteria for promotion and tenure to emphasise relevance and regional engagement.

The higher education programme review and approval process gives significantly more weight to national considerations than to the needs of the region. University faculty members play a dominant role in the approval of college academic programmes. There is a lack of support for integration of field experience, work-experience and community service within the curricula. The long delay in the process for approval of new academic programmes, which in some cases lasts for more than five years, inhibits the responsiveness of higher education institutions to changing regional needs. There is a need to ensure that higher education programme review and approval process is streamlined to allow for speed and greater responsiveness to regional needs.

The higher education funding policies do not give explicit consideration to providing incentives for regional engagement of colleges. The principal incentive for the colleges is negative: their exclusion from research funding. Student numbers are established centrally and there are no incentives to enrol students from within the region. Because the institutions depend to a degree on revenue from tuition fees (within limits set by the Planning and Budgeting Committee), they have incentives to recruit paying students from outside the region to generate additional revenue. There are no explicit incentives for institutions to reach out to and increase the enrolment of under-served population groups, especially the Arab and ultra-Orthodox Jewish populations who lag in participation rates. Funding mechanisms need to be created to provide incentives for regional engagement of higher education institutions.

Israel has no clearly identifiable regional policy. Efforts for the development of the Galilee have focused on attracting talent or businesses from outside of the region. The Galilee would benefit from a tailored place-

based policy with emphasis on the development of the endogenous assets in the region: human capital and traditional industry.

The assets of the different regions in Israel are diverse and their potential for growth will depend on how public policy is adapted to specific challenges within these regions. While the development of the Galilee has been the official policy of the Israeli government for decades, efforts have often focused on attracting talent or businesses from outside of the region. Interventions at the regional level have been largely defined and implemented in a top-down fashion from the centre. Regional and local levels remain weak, particularly in the Arab sector and there is an absence of underlying tradition of collaboration. There is no mechanism or platform for higher education institutions and regional stakeholders to discuss regional development.

The key question is how to improve the educational attainment levels and employment outcomes of the endogenous Galilee population, half of which are Arabs. This calls for sustained investments in education, schools and infrastructure, active widening access policies and providing diverse educational opportunities to Arab women and building up vocational tertiary education opportunities for Arab men. It also calls for diverse and flexible re-skilling and up-skilling opportunities of the population to help the population adjust to rapid changes in the labour market. Results from the investments in education will be visible only on a medium-long term perspective. A failure to focus on endogenous development of human capital will have serious impact on the sustainable national development, endangering Israel's international competitiveness and security.

Israel would benefit from policies aimed at boosting productivity, such as those targeted at innovation and entrepreneurship and improving education and vocational training. These areas have a strong regional dimension. This calls for tailored place-based policy for the Galilee that can make targeted efforts to improve the quality of public investments and services to the regions. Enhancing regional growth through context-specific regional policies would benefit national growth and regional cohesion which is important for the sustainable development of Israel.

Improving connectivity is a major challenge in the Galilee with most of the population living in small towns and villages. Intra-regional disparities in access to public transport and telecommunication services, and discrepancies

in investments in infrastructure between different population groups remain significant and have a negative impact on educational and labour market outcomes.

Connectivity is a major challenge for the development of Israel and the Galilee. The geographical, topographical and ethnic-religious situation presents a number of challenges for providing access to transport infrastructure, communications and public services, especially in peripheral regions. Connections between urban centres and rural areas are crucial for greater development and widening access to labour force and education. Further improvements in infrastructure are needed to connect peripheral regions and rural areas.

Regional disparities in access to telecommunications remain significant and pose a challenge for regional development in terms of widening access to education in remote areas, improving teleworking opportunities for place-bound Arab women and dissemination of innovation in small and medium-sized enterprises. While no robust data was available about the inequalities in access to communication, they are likely to broadly correspond to disparities in GDP per capita. Improving access to telecommunications represents a potential source of growth and should be favoured.

The health conditions of the Galilee demonstrate a high correlation between the poor health outcomes and the low socio-economic status of the population. The new medical school provides an opportunity to address the health challenges in the region and build capacity for collaboration. It can also mark the beginnings of the first university in the Galilee.

Whereas public health profile in the centre of Israel is similar to that of other industrialised western countries, the epidemiology of the Galilee is closer to the health profile of developing countries. There is also underinvestment in health infrastructure and personnel in the Galilee. The new medical school can radically change the way medical education occurs in Israel and the Galilee and improve access to healthcare services in the region. Community-based approach to medicine and medical education can benefit the region and improve students' learning outcomes. It can shift the focus from specialisation, treatment of acute diseases and hospital-based care towards prevention, treatment of chronic disease and community-based medicine. This will require a change in clinical training based in acute care

hospitals to training in community-based ambulatory care facilities. At the same time considering the current underinvestment in health infrastructure and personnel in the Galilee, a strong system of collaboration should be built between the hospitals and the new medical school. Joint research centres between hospitals and the medical school could be established in the areas that focus on the epidemiology of the region, including genetics, metabolic diseases and health promotion.

Innovation in the use of information technology (IT) in the delivery of health services should be a core mission of the new medical school. The new school and research institute provide an opportunity to link Israel's leadership in the IT industry with more effective health care delivery – from new individualised computer-based medical records systems to the use of telemedicine to reach isolated populations. Rather than traditional university-based research in the biosciences that requires high-cost facilities, the school should focus on applied research that integrates and synthesises existing knowledge using information technology to achieve improved health outcomes for the region's population. Innovations in medical education and health care delivery are more likely to succeed if supported by deliberate public policies to counteract the inevitable resistance to change.

The following measures would build capacity for regional development in the Galilee:

- Authorities should widen the criteria for promotion and tenure to emphasise relevance and regional engagement. The criteria could include: *i*) research on issues relevant to the region, giving more emphasis to application, synthesis and integration than to discovery of new knowledge, *ii*) service to community while requiring evidence that contributions to community and region are documented and externally validated and *iii*) stronger relationships among research, teaching and service through integration of research relevant to the region in the curricula and student learning and integration of service to the community in curricula, research and student learning.
- Authorities should ensure that higher education programme review and approval process is streamlined to allow for speed and greater responsiveness to regional needs. The process should be adapted to emphasise regional engagement through increased representation of college faculty on the review committees of the Council of Higher Education (CHE) and efforts to seek the advice of regional leaders (employers, community leaders, regional economic development officials) in the CHE review process. Criteria emphasising regional

engagement and responsiveness should be included in the review and approval process, for example: *i*) data documenting the specific gaps in access and opportunity for the population and important sub-groups (e.g. Arab population with attention to different needs of Arab men and women), *ii*) data documenting relevant regional labour market needs and potential future needs arising for regional economic development plans, *iii*) evidence of the engagement of regional stakeholders (employers, community representatives and representatives of under-served sub-populations) in programme planning and design and *iv*) emphasis on regional engagement (internships, community service, student research on regional issues) within the curricula and student experience.

- Authorities should develop higher education funding mechanisms to provide incentives for regional engagement of higher education institutions, for example through: *i*) formulae for block grant funding could include higher weights for enrolment of students from within the region, from special populations such as Arabs and ultra-Orthodox Jewish students or for enrolments in academic programs related to regional labour market needs, *ii*) policies governing tuition fees could provide for lower fees for in-region students and policies for financial aid to students can provide higher amounts for in-region students and special populations, *iii*) eligibility for special or "categorical" funding could be contingent on evidence of regional engagement and focus, *iv*) requirements that institutions collaborate in order to obtain funding and *v*) special funds could be established to provide matching of funding obtained by higher education institutions from contracts with regional employers for education and training services. Israel could establish a special regional investment fund (funded from public and private resources) to provide funding for building HEI capacity for regional engagement and provide incentive funds to institutions and individual faculty members for regional initiatives. These could emphasise increasing tertiary education access and opportunity for the region's population (especially target populations), engaging faculty members and students in teacher/learning and applied research projects related to regional priorities. Kentucky Regional Stewardship and various programmes provided by the Higher Education Funding Council in England (HEFCE) provide examples.
- The new medical school should address the unique regional health challenges in the Galilee. Its focus should be on community-based medical education and new forms of health care delivery as well as generating of innovations that link Israel's IT leadership with effective health care delivery (telemedicine and individualised computer-based medical records systems). Authorities could support partnerships with

medical schools and health care delivery systems that have implemented community-based medical education to boost innovation in medical education or new forms of health care delivery. Authorities could provide competitive funds (with public and private support) dedicated to supporting a new research agenda (use information technology for innovation in health care delivery within the region) and incentive funding for recruiting and training the region's population for health careers. Authorities could incentivise collaboration to strengthen the capacity of the existing higher education institutions and research institutes in the Galilee by: *i*) encouraging new academic programmes in social work, psychology and the allied health professions to be offered in collaboration with the new medical school programmes that provide opportunities for joint community-based clinical training, *ii*) providing opportunities for college students to transfer credits to the new medical school, *iii*) providing opportunities for college faculty to compete for funding for research to be conducted through the new institute, *iv*) providing opportunities for college faculty to have joint appointments with the new medical school and research institute and *v*) providing incentives in college faculty appointment and promotion policies that recognise and reward faculty engagement in scholarship on the region's health, social and economic issues.

- Israel should enhance capacity building in regions. Experience in the OECD countries shows that increased decision-making power at sub-national levels of government combined with co-ordination mechanisms can unleash the potential in the regions. As regional capacities are built through “learning by doing”, increased responsibilities at the regional level are necessary to build skills and develop problem-solving approach. A regional strategy platform should be developed in the Galilee. The joint resources of the higher education institutions should be mobilised for the preparation and implementation of regional strategies. The capacity for regional engagement should be improved in the region among key agencies and higher education institutions through fora for communication where good practices can be fostered and through targeted training programmes with focus on practical problem solving. Evidence-based decision making should be strengthened in the region by focusing on a dashboard of key indicators that the key regional stakeholders can monitor over time. This can result in a shared local knowledge base which will galvanise the development of a strong local strategy for change.
- Connectivity between urban centres and rural areas should be improved and further improvements in infrastructure should be made to connect peripheral regions and rural areas. High speed internet connections

should be developed to enhance access to education in remote communities and teleworking opportunities for place-bound population groups.

OECD reviews of higher education in regional and city development

Universities and other higher education institutions can play a key role in human capital development and innovation systems in their cities and regions. In the context of global economic and financial crisis, OECD countries are seeking to mobilise higher education institutions (HEIs) to support more strongly their economic, social and cultural development.

In 2008, the OECD/IMHE launched a second series of OECD Reviews of Higher Education in Regional and City Development to address the demand by national and regional governments for more responsive and proactive higher education institutions. As a result, 14 regions in 11 countries have undergone the OECD review process in 2008-11.

This OECD Review of Higher Education in Regional Development of the Galilee in Israel (www.oecd.org/dataoecd/56/45/49001753.pdf) explores a range of policy measures and institutional reforms to mobilise higher education for the development of the region. It is part of the series of the OECD reviews of Higher Education in Regional and City Development. The reviews analyse how the higher education system impacts local and regional development and help how this impact can be improved. In addition to human capital and skills development, technology transfer and business innovation, the reviews also considers higher education's contribution to social, cultural and environmental development and regional capacity building.

To know more about the OECD review process and requirements, visit Higher Education and Regions' website at

www.oecd.org/edu/imhe/regionaldevelopment.