Chapter 4: Social, cultural and environmental development

Social, cultural and environmental development underpins and stabilises economic growth and improve community health and welfare, social cohesion as well as clean, healthy and sustainable environment. This chapter will review the contribution of the higher education institutions of the Bío Bío Region to its social, cultural, and environmental development. Due to the fact that the region has the highest percentage of a rural population in Chile, the chapter will have a special focus on rural development, where social innovation aiming to foster local initiative is one of the features of sustainable rural economies. The chapter concludes with recommendations.

The social conditions in the Bío Bío Region have improved considerably in the last two decades. Still, in a national comparison, Bío Bío is one of the regions with the highest proportion of poor and indigent families. Rural poverty is more prominent than in cities: several municipalities in the region count among the poorest in the country, although their situation has improved over recent years.

Despite the improvement over time, in terms of the UNDP HDI (Human Development Index)[1] that combines life expectancy, education attainment and per capita income, the Bío Bío Region continues to under-perform. In 2003, the Bío Bío Region ranked number 10 in Chile with the value of 0.686 which is lower than the national average of 0.725 (UNDP, 2004).

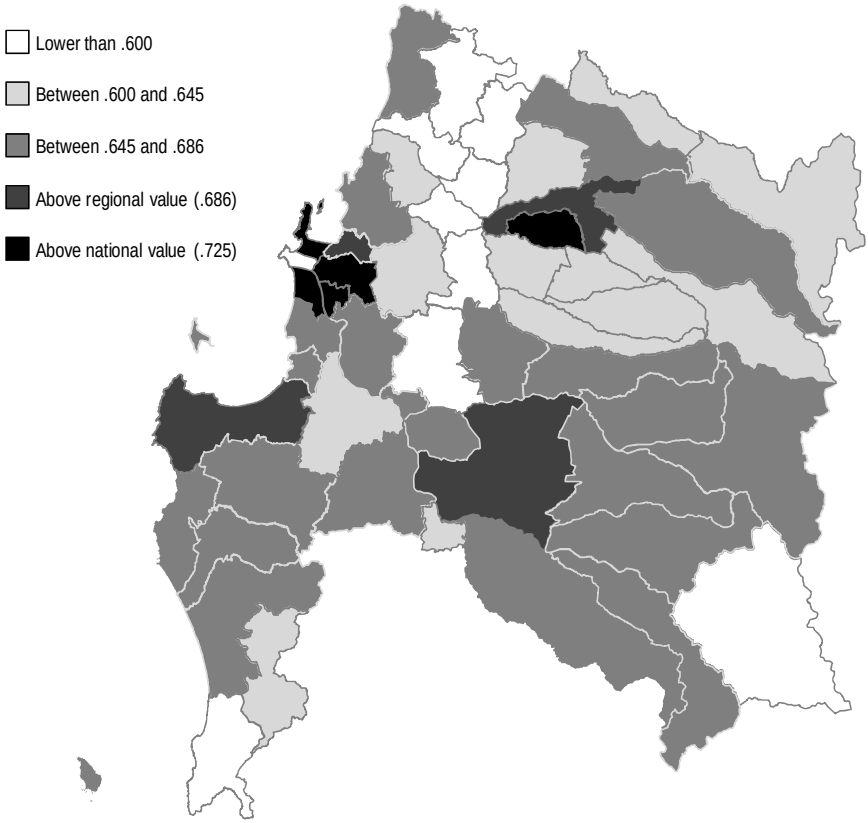
Nine out of the 54 municipalities have HDI scores above the regional value (0.686) and only five municipalities (Talcahuano, Chillán Viejo, Concepción, Chiguayante and San Pedro de la Paz) are above the national value (0.725) (see Figure 4.1).

The Bío Bío Region is the third densely populated region in Chile with Greater Concepción representing 36% of the regional population. At the same time, it has the highest percentage of rural population (18%) in the country. This share has diminished over years with increased urbanisation and its corollary, rural out-migration. Out-migration, usually resulting from reduced job opportunities in agriculture because of increased mechanisation and productivity, entails ageing of the population and a general loss of vitality of rural economies, a trend that has affected or is still affecting many rural areas worldwide.

Another characteristic of lagging economies relates to higher unemployment: in the Bío Bío Region average regional unemployment was at 11% at the beginning of 2009 but it reached 18% in some rural areas. Unemployment is structural in nature and linked to shifts in the regional economy. As a consequence, the region is a net exporter of population with half of the migrants moving to the Metropolitan Region.

The Bío Bío Region is culturally diverse. Of the total regional population 7.8% declare to belong to one of the eight officially recognised ethnic groups, although the great majority of these are Mapuche. Most have moved to urban centres, living in conditions of poverty and indigence. Alongside ethnic identity there remains the heritage of certain activities that have evolved like coal mining, forestry, fishing and agriculture, textiles and steel. Only 3.8% of the regional population participates in community organisations and in art and cultural events. In the case of indigenous populations, only 0.6% participates in ethic and community organisations.

Figure 4.1. HDI in the municipalities of the Bío Bío Region



Note: No data are available for the municipalities of Hualpén and Alto Bío Bío (both created in 2004).

Source: Data from UNDP (United Nations Development Programme) (2004), *Las Trayectorias del Desarrollo Humano en las Comunas de Chile 1994-2003* (Human Development Pathways in Chile's Municipalities 1994-2003), UNDP/MIDEPLAN, Santiago de Chile.

Despite the improvements in recent years, there are various environmental risks, often due to economic activity in the region. These include soil degradation due to monocultures, reduced marine biomass due to polluted bays, air pollution from industrial activity, damage to ecosystems through the construction of hydroelectric power plants, risk associated with fuel distribution, garbage dump and stocking areas.

In the context of diverse population, growing rural-urban divide and environmental degradation, this chapter examines:

- What is the contribution of higher education institutions to the Bío Bío Region's cultural, social and environmental development, particularly in rural areas?
- Are the activities of the higher education institutions appropriately targeted to address the key challenges in the region? Are there gaps in delivery and or emerging areas and topics that would benefit from closer attention from the higher education institutions?
- What lessons can be learnt from international experience?

4.1 Rural development policies and higher education programmes

Chile has become a major agricultural export country and the Bío Bío Region is one of the main contributors to this segment of the economy. National policies seek to further develop the country's comparative advantages in this area. Of the eight clusters identified by the National Innovation Council in 2007, four concern agriculture and fishing (fish farming, pork and chicken farming, processed food and fruit industry) and one – tourism — has impact in rural areas.

The profile of the rural economy of the Bío Bío Region is contrasted. The region is leading in forestry with 37.3% of Chilean forest plantations and close to 60% of sawn wood production in 2007. The sector is dominated by a few highly productive export oriented firms but the share of higher added value transformed products remains modest compared to basic wood products (pulp and cellulose, sawn wood) accounting for two thirds of regional exports. The extensive development of planted forest land has entailed a decrease in agricultural land of around 3% per year, compensated by improved productivity, so overall production levels have increased while promising new developments (berries, asparagus) have appeared. Land tenure is mostly characterised by small size: close to 50% of farms in 2007 had less than 5 km^2 but more than 50% of cultivated land was within farms of more than 50 km^2. Lastly, fishing is an important component of the economy in the Bío Bío Region, the second region for this activity (20.6% in 2005). Depletion of resources and quota policies, have however led to reduced catches and increased unemployment in coastal areas, with new venues in aquaculture being sought. The Bío Bío Region has an important potential for aquaculture that is not exploited to this day, contrary to other Chilean regions.

The Regional Development Strategy of the Bío Bío Region for 2008-2015 aims to increased competitiveness in a certain number of sectors including agriculture while also emphasising education, science, technology and innovation. These policy priorities are well reflected in the "Agenda for Innovation and Productive Development of the Bío Bío Region for 2008-2012" with the first "Programmes for Improvement of Competitiveness" (PMCs) relating to education and innovation on one hand and to agriculture (first component: cattle breeding) on the other. Although most programmes relating to education and innovation do not directly concern the rural economy, these can be developed by capitalising on the presence of higher education institutions in rural areas, while the PMC targeting agriculture involves their R&D and training capacities. Higher education institutions are well placed to impact the PMCs: The management committees of the two PMCs include representatives from higher education institutions and the Education and Innovation PMC is presided by the Rector of the Universidad Católica de la Santísima Concepción.

The major higher education institutions, universities, professional institutes (IPs) and technical training centres (CFTs) maintain presence in the different provinces of the Bío Bío Region, including the most rural ones. In Chillán, the capital of the Province of Ñuble, a major higher education presence directly relevant for rural areas is maintained by the University of Concepción, the University of Bío Bío, the Universidad Católica de la Santísima Concepción and INACAP. The University of Concepción opened its Chillán campus in 1954 and has trained up to this day 1 500 agronomists, 1 000 veterinarians and 300 agricultural engineers, the only curricula of its kind in the country; it cooperates in different research projects with agri-food firms and has contributed to major productivity gains in the agricultural sector while helping in the launch of successful niche products such as berries, asparagus and medicinal plants (within Technology Transfers Groups relying on laboratory resources) in which the Bío Bío Region now enjoys the top position in terms of production in Chile. Quality wine production now developing in the Itata Valley is supported by means of a wine analysis laboratory. The University of Concepción in Chillán successfully cloned the first calf in Chile in 2008.

The Universidad de Bío Bío opened a food analysis (health and quality control, certification) laboratory in Chillán in 2000 (LECYCA) that cooperates with small and medium sized firms. Financing of the centre was ensured by the regional government with support from the FNDR (National Fund for Regional Development). The other major university institutions with impact in rural areas are located in Concepción. The University of Bío Bío has a Forestry faculty with different undergraduate (architecture, forestry, industrial design, civil engineering, etc.) and graduate programmes

(energy efficiency and sustainable habitat, wood construction, architecture and city planning, etc.). Laboratory facilities conduct research in wood genomics, composite materials and bio-deterioration in particular.

Teaching, training and research in the fields of fishing resources is carried out by the Universidad Católica de la Santísima Concepción with major strategic research and projects developed in the context of the important difficulties now facing the fishing industry (12 000 jobs in the region). Several higher education institutions, including the Universidad Católica de la Santísima Concepción, University of Concepción and IP Arturo Prat, also participate in a "Public-Private Roundtable" discussion on investigating future development strategies for the fishing industry in the Bío Bío Region.

4.2 HEIs widening access and providing services to rural communities

The higher education institutions in the Bío Bío Region see widening access and increasing participation of students from lower socio-economic backgrounds as their key social contribution to regional development. They have been instrumental in the increased access of the lower income quintiles to higher education. As seen in Chapter 2 on human capital development, with the help of funding from the Ministry of Education, they have each developed their own projects and approaches to collaborate with the schools by improving the management of the schools themselves and raising the aspirations and learning outcomes of students.

The University of Concepción has developed "Talent Programmes" in cooperation with the municipal councils of Hualpén and Talcahuano. The programmes aim to motivate secondary school pupils towards higher education and help them to determine their future study areas by bringing in top level professionals and scientists to speak about different careers during meetings organised in the schools. The University of Bío Bío has devised a programme in the Province of Arauco in favour of young people who have failed university entrance exams but accept to sign up for basic professional training in different fields. As seen before, the Universidad Católica de la Santísima Concepción is the only university to maintain a campus in the same province (the one with the highest percentage of indigenous population, mostly Mapuche), with 1 500 students attending its Cañete Agricultural Technology Transfer Centre. The San Sebastián University has identified five secondary schools in different parts of the Bío Bío Region presenting specific characteristics of social vulnerability, where targeted support programmes to ensure that students are better prepared for entry into the higher education system.

Most higher education institutions also provide a wide variety of services to different communities, usually in the health and social sector. Valuable work is carried out, not the least in rural areas where many higher education institutions reach out to the low income population segments in particular. In many cases students are involved in non-credit bearing outreach activities. While lack of doctors and particularly certain specialists in rural areas is a recurring problem, the region's low income population would also benefit from stepping up preventive health care. Both approaches are present among the higher education institutions in the region, as is evident in the examples below. Again, each institution has developed its own projects and approaches to collaborate with municipal government and/or other stakeholders and funding agencies to improve the social conditions in the region.

The University of Concepción has established a programme in ophthalmology whereby students receive financial support on the basis of an agreement to serve a minimum of three to five years in rural areas. This programme is now being opened up to other fields of medical practice. In addition, the university has started a programme in line with the national initiatives, which encourages university graduates in medical fields to stay and work in remote areas after graduation. The San Sebastián University has a special commitment to social responsibility and delivers this commitment through all study programmes. It has, for example five dental clinics in different parts of the region and has signed a series of agreements with municipalities to facilitate access of the poorest people to these facilities. The University of Bío Bío has implemented information campaigns to counter infant malnutrition in the countryside, contributing to a dramatic decrease in mortality rates (the infant mortality rate was reduced from 75 per 1 000 in the 1970s to 6 per 1 000 today).

Most of the higher education institutions' initiatives are based on social innovation and address sector-specific issues, lacking a more integrated approach to local economic and social development in the region. There are, however, some innovative approaches under way that will be both impactful and could be extended and scaled up. For example, the University of Bío Bío opened the Agri-business programme in Chillán at the beginning of 2009 that is creating a public-private regional network to train entrepreneurs in new marketing techniques and pricing strategies.

Another innovative approach to local economic social development is taking place in El Carmen with the help of the University of Concepción. El Carmen, situated 45 km from Chillán is home to 14 000 inhabitants and is the poorest municipality in the Bío Bío Region and one of the poorest in Chile. Since 1993, an integrated approach to local economic and social development in El Carmen has been implemented through education and

training with the support of the Faculty of Agronomy of the University of Concepción and INDAP (National Institute for Agricultural Development). Citizen participation in the different actions undertaken is ensured through the seventy "*Juntas de Vecinos*"[2] (neighbourhood associations) that exist in El Carmen. The university is helping to prevent further out-migration by supporting small farmers who receive training in specific areas (irrigation, new cultivation techniques which respect the environment as well as product diversification) with active participation of teachers and students from the faculty within two experimental centres. In addition, to facilitate increased access of young people to higher education certain basic health requirements during the period of primary and secondary schooling have been ensured with the help of the university. For example, the University's dental clinic provides dental care free of charge to all pupils during the 12-year mandatory schooling period.

4.3 Community development in rural areas

While widening access will contribute to outmigration if the best and brightest leave the region to find work opportunities elsewhere, and service delivery will address the symptoms of poverty and indigence, but not their causes, there is a need to reach out and empower communities to address their own problems by strengthening the social economy and cultural identity. Community development programmes aim to build capacity by enabling communities to respond to change and emerging social, economic and environmental challenges. Higher education institutions, in collaboration with local and regional authorities, can play an important role in training community development practitioners, providing lifelong learning and re-skilling and up-skilling opportunities, conducting research into specific issues and best practices and developing co-operation and research opportunities. One of the most innovative examples to approach local development is the European Union LEADER programme which provides tools for bottom-up capacity building and assessment.

The Universidad Católica de la Santísima Concepción has taken an important role in supporting sustainable community development in two rural areas of Coronel and Arauco. In Coronel, the university supports a project of mussel aquaculture developed by a private sector company (Foodcorp) and is carrying out research in soft water fish farming. Collaboration encourages the local fishermen communities to move away from capture fisheries to aquaculture and builds value added segments. In Arauco, the Universidad Católica de la Santísima Concepción has launched the Agricultural Technology Transfer Centre to address the situation of the Mapuche population and their economic development. Mapuche have

recently enforced their campaign to regain land and are in continuous conflict with the leading energy and forestry companies. The two projects not only address the needs of local low income populations, but aim to collaborate with the communities to build their capacity to face the challenges of the changing world. Catholic university's social commitment and access to more flexible funding arrangements have been helpful in this work.

Box 4.1. LEADER: bottom-up local development in the EU

LEADER (*Liaisons entre Acteurs du Développement Economique Rural*) is a European programme based on an integrated and endogenous approach to local development. Since 1991, the LEADER initiative has had three different editions. The programme was first launched for a five year period in 1991 and applied in 220 rural areas of the former EU 15 countries. LEADER II (1994-99) spread to 1 000 rural areas and to more than 1 500 in the enlarged EU 27 countries. The LEADER+ (2000-06) was the last edition of the LEADER as an EU rural development initiative. It placed special emphasis on integrative strategies that connect together all aspects of rural life. The last phase of the LEADER focused on the use of knowledge and technologies, improvement of quality of life, added value to local products and the increase of value of natural and cultural resources.

This bottom-up programme based on a method for the definition, selection and implementation of small projects (many do not exceed EUR 2 000) in rural areas has met success and is now mainstreamed for the present EU programming period (up to 2013), many member countries having integrated LEADER principles and guidelines into their national rural development policies that are increasingly "place-based".

LEADER is based on eight principles: an area-based approach, a bottom-up approach, local partnerships, innovation, multi-sector integration, inter-territorial cooperation, networking, and decentralised management and financing, Most of these principles can be found today in rural development programmes in different countries. LEADER not only pioneered these in local development strategies but devised a methodology combining these different features of processes at grass-roots levels. Implementation of LEADER is voluntary: the public and private actors within a self-defined area based on historical, geographical considerations and/or local assets and know-how get organised as a Local Action Group (LAG) that includes representatives of civil society such as NGOs. A local development strategy is than devised by the LAG on the basis of inputs from workshops and citizen forums. Projects are submitted to board approval within the priorities defined by the strategy. Choice of projects is ensured on the basis of objective criteria and funding is also decided by the board that disposes of an annual budget integrating EU, national and regional contributions. Beneficiaries deliver milestone reports; evaluation is conducted by independent experts and/or specialists and researchers from universities.

Box 4.1. LEADER: bottom-up local development in the EU (continued)

This participatory democracy approach has given new momentum to rural development: empowering people to think about their own future and how to use local assets amounts to recognising them as the best experts with knowledge of the local context and area. Unleashing the human capital potential of course requires capacitation and training, which is an integral part of the LEADER programme. Amongst the principles mentioned above, innovation in processes or content, including social innovation, is particularly important. Networking is embedded in LEADER that also seeks to promote mutual learning: LEADER projects are interconnected through regional, national and European networks to exchange experiences and promote best practices by on-line access to shared resources and regular events.

Amongst LEADER projects, it is worthwhile mentioning several areas: village renewal, youth clubs, promotion of female entrepreneurship, tourism as a second source of revenue for farming families, environmental protection, support to handicraft production, commercialisation of local products, etc. Among the main outcomes of LEADER are new governance practices with increased cooperation between the national, regional and local levels requiring more efficient vertical co-ordination; development of coherent local territorial development strategies promoting fruitful dialogue with regional authorities; a holistic vision of rural spaces going beyond traditional agricultural models, promoting sustainable economic diversification and social integration.

Source: OECD (2006), Rural Policy Reviews, *The New Rural Paradigm: Policies and Governance*, OECD, Paris.

Box 4.2. UCSC building sustainable communities

Coronel and move away from capture fisheries

The community of Coronel is located in the province of Concepción. Coronel has the highest concentration of fishery production in the Bío Bío Region. Unemployment and youth out-migration rates have been at high levels for several decades. In 2008, The Universidad Católica de la Santísima Concepción (UCSC) through its Regional Centre for Environmental, Maritime and Aquaculture Research and Technology Transference (CREAMAR) embarked on a project of mussel aquaculture in collaboration with the biggest local employer in the fishery industry (Foodcorp). The aim of the mussel farming project was to develop an economically efficient aquaculture system for *Mytilus Chilensis* in the micro areas of Llico and Dichato.

Box 4.2. UCSC building sustainable communities (continued)

In this collaboration, the university has conducted research in soft water fish farming and played an important brokerage role creating trust and confidence between the fishermen and the company. The fishermen's associations have provided farming spaces, raw materials, experience and work input. The company has provided commercialisation channels, purchasing capabilities, technology, and financing.

The costs, of USD 570 000 have been evenly divided between *Innova Bío Bío* programme and the company. Collaboration is built on a win-win basis for all participants: the university benefits from R&D work and practical learning experience for its students; the research team includes three students who are developing their thesis. The fishermen benefit from better income and improved quality of life. The company benefits from new business opportunities, production lines and markets and the region benefits from the economic and social impact through wealth creation, employment and move from capture fisheries to aquaculture.

The project has made rapid progress and yielded positive outcomes. The R&D results show that the mussel growth rate is faster and compare positively with the existing operations in Los Lagos Region. It is estimated that the production will amount to 72 tons of mussels per each centre. Job creation will be directly related to the level of mussel production. In order to exploit 20% of the sea area assigned (3.4 km^2), 15 permanent jobs will be created and, in addition, 40 support staff functions will be added. So far, the collaboration has generated 10 new permanent jobs and 100 temporal positions.

The university's role is not only technical: it has functioned as a neutral broker to create trust between fishermen and the companies involved. The project has built strong co-operation between the different actors, including union leaders of the two fishermen's associations, shift managers, marine biologists, university-based researchers, students and state government officials. It has also produced important and sophisticated analysis of where the Bío Bío Region has a comparative advantage and why – in what quality and temperature conditions favourable for a specific type of aquaculture. Finally, the collaboration has contributed to the re-training of the workforce away from capture fisheries to aquaculture which is important to the future of the fisheries cluster. A new vocational education institution has been established in Coronel to support the development of aquaculture.

Box 4.2. UCSC building sustainable communities (continued)

Cañete Agricultural Technology Transfer Centre building sustainable rural development on Mapuche tradition

The Bío Bío Region has the fourth biggest indigenous population in Chile (54 000 in 2002), mostly Mapuche (53 000). There is a high concentration of Mapuche in the Arauco province which is one of the poorest areas in Chile. While progress has been made in access to formal education, the generation gap among Mapuche is greater than among non-indigenous population. The Universidad Católica de la Santísima Concepción is the only higher education institution with a permanent presence and a campus in the province. Around 1 500 students attend the University's Cañete Agricultural Technology Transfer Centre.

In 2009, the centre launched technology transfer activities to serve 200 rural and Mapuche families. The aim is help improve graduate retention and build entrepreneurship based on Mapuche traditions. Based on a 70 hectare area, the centre aims to develop a productive cluster extending from environmentally sustainable cultivation, fertilisation technology and organic production to management and entrepreneurship training. The purpose is to develop and produce wine, livestock (beef and pork) and vegetable products for export purposes. The university has identified an export company that will support the pursuit.

While the project is at its early stages and too new to be evaluated, it holds much promise and represents the single most important response of the higher education institutions in the Bío Bío Region to collaborate with the Mapuche population.

4.4 Rural development: integrated approach to local economic and social development

Because of the reduced role that agriculture plays in employment, rural development requires diversification of the rural economy based on the analysis of existing and potential economic circuits targeting increased added-value. The capacity of local public officials to devise and supervise programmes with important public investment components aiming at diversification is a strategic element in this approach. Administrative divisions and local economic development requirements based on the recognition of links between firms (supply chains, complementary products, shared local know-how based on natural or historical assets) seldom

coincide. Strategic planning needs to bring together public and private partners from different areas, often astride administrative boundaries.

At the end of the 1990s, the creation of voluntary "Planning Territories" was authorised in Chile. They represent groups of communes with common economic and social characteristics, on the basis of voluntary agreements favouring integrated territorial strategies and projects with critical mass. There are ten of these in the Bío Bío Region, one of the first regions to apply the concept. AMDEL (Association of Municipalities for Local Economic Development),[3] created in 2000, regroups six municipalities from the central-eastern part of the region, three belonging to the province of Concepción and three to the province of Bío Bío.[4]

Box 4.3. Universities supporting rural economic diversification

In 2003, on the basis of preliminary findings from a study carried out in 1998 in a single municipality of Bío Bío (Coelemu, Province of Ñuble), the University of Bío Bío, within its Centre for Urban and Regional Studies (CEUR), launched a study of local economic circuits within AMDEL territory with support of SERCOTEC (Technical Cooperation Service, Ministry of Economy) and the regional government. The study entitled "Networks and Opportunities for Development: the case of local economic circuits in the inner prairies of the Region of Bío Bío" (Gatica-Neira, *et al.* 2008) analysed the economy of the territory which is dominated by agriculture and forestry. It came forward with a number of conditions to unleash the territory's development potential:

- A vision of education and training at the level of the territory aiming innovation and entrepreneurship
- Integrated management of tourism circuits within the territory
- Integration of big firms into territorial development projects linked with the production of local goods and services requiring incubation
- Creation of territorial information systems
- Development of human capital within local governments so as to carry forward local development strategies requiring partnerships.

The training component, carried out by the University of Bío Bío since 2008 within its public policy programme in favour of around 20 local civil servants up to now includes: *i*) elaboration and management of projects, *ii*) management techniques and *iii*) cooperative management. The creation of a diploma in strategic territorial management is now being planned by the university.

The new development practices introduced by AMDEL were awarded the first place in the new "*Territorio Chile*" prize in 2008. The methodology of the economic circuit study carried out by the University of Bío Bío is being replicated in another area of the Bío Bío Region and in the Region of La Araucanía.

On the basis of preliminary findings from a study carried out in 1998 in a single municipality of Bío Bío (Coelemu, Province of Ñuble), the University of Bío Bío started a follow-up study of local economic circuits. The study itself as well as the collaborative action and the subsequent capacity building that was achieved by the university can be considered as best practices in territorial development (OECD, 2006) based on close cooperation between different levels of government and local initiative akin to certain features of Place-based policies[5] like LEADER[6] deployed in OECD member countries (See Box 4.3).

4.5 Underutilised potential in environmental and cultural development

Two fields revealing underutilised potential in the region are environmental sustainability and cultural development. The outstanding economic growth of Chile over the past decades has led to increased pressures on the environment. While much of the economic growth has concentrated in urban areas, many rural and peri-urban areas have also been affected. Environmental risks in the Bío Bío Region include soil degradation, reduced marine biomass, pollution from industrial activity, damage to local ecosystems through the construction of hydroelectric power plants and risks associated with fuel distribution, garbage dumps and stocking areas.

The universities in the Bío Bío Region have a wide variety of study programmes and research activities in environmental sustainability, which are beginning to reach critical mass. A degree of specialisation exists among higher education institutions, each supporting different aspects of sustainability (see Box 4.4). The various programmes have impact on regional development through informing policy development to improve environmental protection (water and soil) and regulation, technology transfer linked to industrial processes, renewable energy sources, clean technologies, and through urban development analysis and strategies. There is, however, limited evidence of collaboration among higher education institutions in the region. In fact, it appears to be easier to forge such collaboration with partners outside the region, as the COPAS example shows. In addition, environmental sustainability is not yet integrated across study programmes but appears as an add-on. As a result, the research activity around sustainability has not yet generated green growth in the region.

While good policy design in advancing sustainable development is essential, implementing green growth strategy will go beyond the power of any government. Success will hinge upon profound changes in individuals' behaviour which can be encouraged by both "coercive" (*e.g.* regulatory or

fiscal measures) and "compliance" approaches, for example better information and understanding as well as awareness raising. Higher education institutions can play an important role in raising awareness among the local population.

Box 4.4. Universities supporting environmental sustainability

Universities in the Bío Bío Region have a wide portfolio of study programmes and research activities in the field of environmental sustainability. **Universidad Católica de la Santísima Concepción** has a Centre for Maritime and Harbour Research (CIMP) that focuses on research on how coastal border territories are organised, and a Regional Centre for Environmental Studies (CREA) that focuses on the study of marine populations and marine ecology. **University of Bío Bío** has a Centre of Wood Technology that contributes to the development of products with higher added value for the forest industry, and an Urban Laboratory, oriented towards territorial and urban management. The **San Sebastián University** has a Centre for Rescuing and Rehabilitating Wild Animals and a Recovery Project for the "Tres Pascualas" pond. Universidad del Desarrollo has a Centre for Environmental Engineering Studies (CEIA).

University of Concepción has a Programme for Renewable Energies that collaborates in the BIONERCEL Consortium to boost bio-fuel production using forest biomass. University of Concepción has also a Centre for Environmental Sciences (EULA), which develops research on environmental impacts and offers a doctoral programme in environmental studies with specialisation in aquatic systems, territorial planning and environmental engineering. EULA has generated 29 technology transfer projects to companies and other entities (contract budget of about USD 2.9 million) and 40 research projects (budget about USD 2.1 million). It has 20 PhD researchers, 61 postgraduate and 182 undergraduate students. EULA Centre has monitored the water quality in the region for many years and has contributed to the regulation in this field.

The University of Concepción (UDEC) also has created, in collaboration with the Universidad Austral de Chile, the Centre for South-eastern Pacific Oceanographic Research, COPAS. It initially started with funds from the Centres of Excellence programme of the National Commission for Science and Technology (CONICYT). It received additional financial support from *Fundación Andes*, MECESUP programme of the Ministry of Education and University of Concepción. Since its creation in March 2002, COPAS has generated 217 scientific articles (ISI), 2 books, 23 book chapters and more than 50 undergraduate theses (UDEC, 2009). In addition, COPAS runs an extensive outreach programme to disseminate knowledge on sustainable environmental development to inform the local community. The outreach programme includes school visits, regional meetings for water researchers, and workshops for elementary and high schools teachers. In addition, COPAS is building a knowledge base on the public domain to inform and support policy regarding oceans and climate change.

The Bío Bío Region would benefit from a stronger contribution of higher education institutions to sustainable environmental development. This could happen in many different ways, for example by *i*) generating human capital in areas of sustainable development through learning and further education programmes; *ii*) acting as a source of expertise through research, consultancy and demonstration; *iii*) playing a brokerage role in bringing together diverse regional actors to sustainability process; *iv*) demonstrating good practice through on campus waste management and development activities, strategic planning, building design, waste minimisation and water and energy efficiency practice, responsible purchasing programmes and pursuing good citizen type initiatives like "Green Campus" (OECD, 2007). For example, education buildings make a substantial direct contribution to carbon emissions through their construction, maintenance and use. Their use, for instance, the times during the day when they are open and the periods of the year during which they operate, also have significant indirect impacts on carbon emissions through generation of road traffic and energy use of the buildings.

Higher education institutions in the Bío Bío Region take pride in contributing to cultural assets and cultural development. Particularly, the traditional CRUCH universities offer a range of study programmes, cultural activities and spaces that are also open to a wider public. Most activities are concentrated in Concepción although there are also some efforts to reach out to more remote areas. The universities participate in the leading national and regional associations and funding agencies, including the National Art and Culture Council FONDART (National Fund for the Development of Culture and Arts), the Regional Cultural Secretariat and various consulting committees. In addition, faculty and students participate in community associations adding to the region's stock of human and social capital. However, no systematic mapping of the links and networks has been made.

Despite considerable efforts and some impressive achievements in the cultural field (for example the opera productions by the University of Concepción), the approach remains traditional. In addition, the collaborative inter-institutional action in this field is in its infancy. The region would benefit from a strategy that sees arts and culture as an agent of development through: *i*) enhancing the quality of life of the diverse population; *ii*) indirect economic benefits in attracting and retaining talent which can drive the knowledge society and *iii*) contribution to the creative industries through enterprise formation, growth, productivity and employment.

Box 4.5. New Zealand and the Māori

New Zealand has a Māori minority of 652 900 inhabitants,[7] representing 15.3% of the country's population. Higher education institutions in New Zealand have an important role in informing policy, increasing teaching and research related to indigenous interests and needs. Although Māori, on average, have higher poverty and unemployment rates than the rest of the New Zealand population, their conditions are improving. For example, by 2006 the value added by Māori enterprises was NZD 8.3 billion reaching 5.3% of the national GDP. The number of Māori entrepreneurs has increased by 21.8% since 2001, far more than non-Māori ones.

Māori people have made significant progress in maintaining their language. Many New Zealand schools now teach Māori culture and language and pre-school kohanga reo (language nests) have been launched to teach children exclusively in Māori. The language nests are now extended through secondary schools. The universities have increased the number of Māori academics and the amount of their teaching and research activities. They have also developed academic work to understand and promote Māori culture and activities, provided spaces and specific services oriented to Māori students and teachers, developed academic debate about political and business organisations for Māori and developed a Māori innovation framework.

Māori academic leadership has been promoted through the Manu Ao Academy, an inter-University Māori Academy that aims to promote Māori leadership, advance Māori scholarship excellence and strengthen the interface between Māori professionals and academics. The Māori Academy, in association with the eight New Zealand universities and supported by the New Zealand Vice-Chancellors' Committee, provides a wide range of activities, including weekly seminars, lectures, academic fora, leaders groups and other related events at each university campus. The focus is to strengthen the interface between professional practice and university education so that academic courses and research can be better aligned with workplace demands, and practitioners can engage with and contribute in a meaningful way to the university sector. This collaboration between Māori professional organisations and universities at local levels provides a focused and integrated approach to Māori achievement and participation in the society and economy.

Sources: Manu Ao Academy (2009), Presentation, *www.manu-ao.ac.nz/content/files/manu_ao_presentation.pdf*, accessed 17 January 2010; New Zealand's National Statistical Office (2009), Māori population estimates at 30 June 1991–2009, *www.stats.govt.nz/methods_and_services/access-data/tables/maori-population-estimates.aspx*, accessed 17 January 2010.

Higher education institutions can be major players in making their regions more international and multicultural. While there was some

evidence of growing interest and activity among higher education institutions to collaborate with Mapuche, the local indigenous population, these activities remain isolated and small in scale. Encouraging international examples come from, for example New Zealand were the universities have played an important role to promote Māori leadership development and participation in the society and economy (Box 4.5).

Higher education institutions in the Bío Bío Region are gradually increasing their international networking, mainly with Spanish speaking institutions and regions. While the number of international faculty and students is still modest, there is potential for talent attraction through joint marketing and better services. This area is being addressed in the current PMC (Programme for Improvement of Competitiveness) for Education, Science and Technology (Bío Bío Educates and Innovates). In future, more effective use of the higher education institutions' international linkages with international research and education should be made to benefit the region, for example by linking internal faculty and students with the region and its working life. For example the University of Granada in Andalusia, Spain, currently the most attractive Spanish university for exchange students, has taken steps to link the international students with the local businesses.

Conclusions and recommendations

Rural areas in the Bío Bío Region constitute an asset for the region because of their wealth in natural resources that put the region in top positions within the country in certain primary sector activities such as forestry, fishing or selected agricultural products. These rural areas also face important challenges in terms of unemployment, poverty, out-migration and environmental degradation. Ethnically diverse population is also an asset to the region because of their wealth of cultural resources that can help position the region as a diverse, tolerant and attractive place to live and visit.

Policies deployed at the national and regional levels focus on innovation in these areas and the three first PMCs defined by the Regional Innovation and Productive Development Agency (ARIDP) within the Agenda for Innovation and Regional Competitiveness (agriculture, tourism, higher education) relate directly to or have impact in rural areas. Higher education institutions in the Bío Bío Region are responsive to rural needs, whether in terms of their geographical spread, their areas of specialised learning and research that directly contribute to local employment and to the rural economy.

Higher education institutions have strongly contributed with their policies and projects to widening access to higher education to students from

the lowest income quintile families, many of which reside in rural areas. They render important services to local communities, particularly in the health sector. In addition, they provide significant contributions to local development by bringing in the training and the knowledge required for the definition and implementation of regional strategies. Many of these initiatives are built on innovative approaches to address the economic and social challenges of rural areas in the Bío Bío Region.

However, limited resources are spread thinly. There is a lack of critical mass to generate projects which will have real impact at the local and regional level and generate multiplier effects. Collaborative mechanisms among higher education institutions to build capacity and foster joint efforts for regional development remain limited in scope and representation. In spite of broader initiatives such as the PMCs, the picture of the diverse programmes and projects with participation of higher education institutions is one of fragmentation built on generally separate and non-coordinated initiatives stemming more from specific circumstances than an overarching vision of needs and possible converging efforts. There is considerable underutilised potential for example in environmental and cultural development as well as international collaboration.

To continue to deepen the higher education institutions' contribution to the social, cultural and environmental development in the Bío Bío Region the OECD/World Bank Team recommends:

- Respecting the freedom of each institution to engage in the programmes and projects of its choice, a systematic exchange of information and experience should be put in place between higher education institutions in social, cultural and environmental matters facilitated by the regional government in order to bring greater efficiency and balanced coverage. Such a forum could organise thematic events, with regular information retrieval and exchange facilitated by a dedicated website. As a first step, higher education institutions' current connections, initiatives and projects involving stakeholder collaboration, community development and/or outreach should be mapped and published in the collaboration platform.

- In addition to widening access and providing services to various communities, higher education institutions should engage in long-term community development seeking ways to empower communities to find their own solutions to various economic, social, cultural, environmental challenges which are global, national and local in nature. They should consider ways to move away from combating poverty to fostering wealth and job creation through social entrepreneurship and view the region as "a laboratory" for

developing research, students' work-based and experiental learning and development projects.

- The region should, in collaboration with the higher education institutions and other stakeholders, develop a strategy that sees arts and culture as an agent of development through: *i*) direct benefit in enhancing the quality of life of the diverse population; *ii*) indirect economic benefits in attracting and retaining talent which can drive the knowledge society, and *iii*) a direct contribution to the creative industries through enterprise formation, growth, productivity and employment. This strategy should address the needs of the diverse populations in the region and also enhance the internationalisation of the region.
- The region should, in collaboration with higher education institutions and public and private sector increase efforts to support sustainable environmental and economic development through a comprehensive strategy bringing together diverse regional actors to sustainability process. Higher education institutions should scale up their efforts to provide learning and further education programmes in sustainable development; to act as a source of expertise through research, consultancy, strategic planning and demonstration; to demonstrate good practice through campus waste management and development activities, strategic planning. Building design, waste minimisation and water and energy efficiency practice, responsible purchasing programmes and good citizen type initiatives like "Green Campus".

Notes

1. The Human Development Index (HDI) was introduced in the first UNDP's Human Development Report (1990) as a new way of measuring development by combining indicators of life expectancy, educational attainment and income into an index.
2. The first neighbourhood associations appeared in Chile in 1965. They are of a voluntary nature and have proved to be useful vehicles for citizen involvement in local decision-making.
3. Association of Municipalities for Local Economic Development (*Asociación de Municipios para el Desarrollo Económico Local, AMDEL*)
4. Province of Concepción: Florida, Hualqui, Santa Juana; Province of Bío Bío: San Rosendo, Yumbel, Cabrero
5. The OECD Territorial Review of Chile (2009) indicates that decentralisation trends in Chile need to be pursued, in particular by strengthening the role of regional governments. It also states that Chile is still lacking a true rural development policy as measures in favour of rural areas remain mostly oriented towards agriculture
6. See "A LEADER Dissemination Guide Book based on programme experience in Finland, Ireland and the Czech Republic", Finnish Rural Policy Committee, Helsinki 2008
7. New Zealand's National Statistical Office. Māori population estimates at 30 June 1991–2009 (New Zealand's National Statistical Office, 2009).

References

Gatica-Neira, F. *et al.* (2008), "Redes y oportunidades de desarrollo: el caso de los circuitos económicos locales en el secano interior de la Región del Bío Bío", University of Bío Bío, Concepción, pp. 261-268.

Manu Ao Academy (2009), Presentation, *www.manu-ao.ac.nz/content/files/manu_ao_presentation.pdf*, accessed 5 December 2010.

New Zealand's National Statistical Office (2009), Māori population estimates at 30 June 1991–2009, *www.stats.govt.nz/methods_and_services/access-data/tables/maori-population-estimates.aspx*

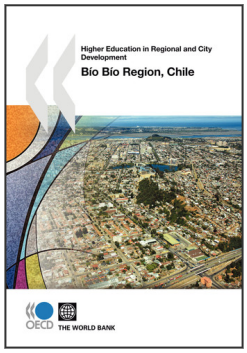
OECD (2006), *The New Rural Paradigm: Policies and Governance*, Rural Policy Reviews, OECD Publishing, Paris.

OECD (2009), *OECD Territorial Reviews: Chile 2009*, OECD Publishing, Paris.

UDEC (University of Concepción) (2009), Centre for South-eastern Pacific Oceanographic Research (COPAS) website, *http://copas.udec.cl/eng*, accessed 16 November 2009.

UNDP (United Nations Development Programme) (2004), *Las Trayectorias del Desarrollo Humano en las Comunas de Chile 1994-2003* (Human Development Pathways in Chile's Municipalities 1994-2003), UNDP/MIDEPLAN, Santiago de Chile.

Wade, P. and P. Rinne (2008), *A LEADER Dissemination Guide Book based on programme experience in Finland, Ireland and the Czech Republic*, Finnish Rural Policy Committee, Helsinki.



From:

Higher Education in Regional and City Development: Bío Bío Region, Chile 2010

Access the complete publication at:
https://doi.org/10.1787/9789264088931-en

Please cite this chapter as:

OECD/The World Bank (2010), "Social, cultural and environmental development", in *Higher Education in Regional and City Development: Bío Bío Region, Chile 2010*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/9789264088931-8-en

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.