



## Program of Technical Assistance and Development of Human Capital to Promote the Cross-Border Productive Ecosystem of Arica - Tacna (eraser)

### Introduction

The effort of development and border integration of Peru with Chile during the past 20 years has made the improvement of the quality of life of the people of both countries a priority. The ecosystem Tacna (Peru) and Arica (Chile) is also a manifestation of this joint effort. In this context, several interventions have emerged, the most recent being INNOVACT (EU - CELAC), mostly promoted by regional and national governments, but also by private entities, and other stakeholders of the community. This proposal comes from universities of each border side, both public institutions, based on an academic relationship of many years with a clearly determined social role. This initiative considers concrete actions the further progress in the productive joint development border ecosystem of the Arica-Parinacota (Chile) region - and Tacna (Peru). This initiative, originated within the Euromipyme Project (ECLAC-EU), counts on the technical support of the Economic Commission for Latin America and the Caribbean (ECLAC) and represents an important challenge for the Jorge Basadre Grohmann National University (UNJBG) (Tacna-Peru) and for the University of Tarapacá (UTA) (Arica-Chile).

This initiative aims to promote and coordinate the integral development of the productive ecosystem of the macro region Arica - Tacna, with both public and private joint participation of stakeholders. It also proposes to facilitate dialogue between the participants of the ecosystem, and to develop associativity in their respective economic activities. In summary, the initiative seeks to identify, analyze, plan and address a series of actions based on the strengths of the Arica and Parinacota - Tacna macro zone, under an orderly and consensual concept, which allows to strengthen the conditions for the consolidation of the Arica -Tacna border system.

The contribution of technical assistance of the Euromipyme Project (ECLAC-EU) consists in the support of actions to participatory processes among key public, private and academic stakeholders of that territory, aimed to develop and strengthen the productive industry of the ecosystem of the Tacna - Arica macrozone. The main focus of this support is the design of activities that encourage joint investment and innovation in supply chains with the participation of large, medium and small businesses in three areas: agriculture, tourism and renewable energy.

It should be noted that, as it's a border initiative, the authorities of the regional governments and foreign ministries of both countries share this vision, as manifested in the content of the Declaration of Paracas of October 10, 2019, on the occasion of the Presidential Meeting and the III Binational Cabinet of Ministers of Peru - Chile. (Attachment 1). In that declaration, the presidents of both countries highlighted, among other aspects, "the importance of cross-border cooperation, instructing the Ministries of Foreign Affairs to help implement the cooperation plan for cross-border innovation, particularly projects on the development of tourism and smart agriculture."

Moreover, the coordinators of the initiative of both universities were invited to the VIII Meeting of the Committee of Border Integration and Development (ICDC) Peru - Chile, realized in the city of Tacna on 7 and 8 August this year, to present the project that promotes the Arica - Tacna ecosystem, which was very well received by the authorities and other participants in that cross-border discussion.

## 1. General Background

The Arica and Parinacota Region - Chile and the Department of Tacna - Peru, are bordering regions that are located at a distance of approximately 58 km and maintain a dynamic and permanent contact.

Figure 1. Map of the border area Tacna (Peru) - Arica (Chile)



### 1.1. The Arica and Parinacota Region.

The region is located in the extreme north of Chile, from 17 ° 30 'to 19 ° 13' south latitude, with a population of 226,068 inhabitants, according to the 2017 Census. It limits the north with the Department of Tacna, Peru; to the south with the Tarapacá region of Chile; to the east with the Department of La Paz, Bolivia; and to the west with the Pacific Ocean. The regional capital is the city of Arica, located

at 2,065 km. from the capital Santiago de Chile. It covers the Province of Arica, with the municipalities of Arica and Camarones and the Province of Parinacota with the municipalities of Putre and General Lagos.

The Province of Arica is characterized by having a coastal desert climate with exceptional temperature conditions, and an annual average of 18°C, very low occurrence of rainfall and high solar radiation. These characteristics have been fundamental for the development of agriculture, an economic activity that has achieved high levels of technology, especially with regard to the use of available water and the management of production processes, achieving high profitability, especially in the Azapa valley, through the production of vegetables, particularly tomato, for marketing in the central part of the country. The regional capital plays a relevant role in Chile's interrelationships with Bolivia and Chile-Peru. This interaction is mainly produced by commercial activity, which operates through the existing border crossings.

## 1.2. The Department of Tacna.

The most southern region of Peru, with a population of 329,332 inhabitants (Census 2017) limits at the northwest with the department of Moquegua, at the northeast with the Department of Puno, at the south with the Republic of Chile, at the east with the Republic of Bolivia and to the west with the Pacific Ocean. The capital of the department is the city of Tacna, at 1,293 km. from Lima. It is located nearby the south western coast of the Pacific Ocean and its geographical coordinates are situated between 16 ° 58 'and 18 ° 20' south latitude and 69 ° 28' and 71 ° 02' west longitude. It covers an area of 16075.73 km<sup>2</sup>, representing 1.25% of the country; Politically it is divided into 04 provinces (Tacna, Tarata, Candarave and Jorge Basadre) and 28 districts.

This Department is characterized by having a dry climate, with a drizzling season that lasts from June to August. The annual average temperature is 18.6 degrees Celsius, with a maximum of 32 ° C and a minimum of 10 ° C. It stands out for its economic dynamism and commercial offer, agricultural production, its varied gastronomic offer, health care and tourist flow, mostly from Chile, from the neighboring city of Arica and other regions. The cross-border movement, whether for commercial, health care or touristic reasons, is carried out respectively through the border complex of Chacalluta (Chile) and Santa Rosa (Peru).

## 2. Strategic plans and areas of shared interest

Both regions have strategic plans based on development axes, focused on economic growth; equal rights and opportunities. In 2017, the Arica and Parinacota region, or XV Region of Chile, was submitted to a participatory process of public and private actors that led to the design of the current “Regional Development Strategy (ERD) 2017-2030”. This instrument provides a vision of the regional reality, methodology for governance of the regional government, establishes goals, specifies the critical knots of development and priorities for action and investment at long term. [1](#)

The main axes of development of the XV Region are:

- ❖ Sustainable region.
- ❖ Socially integrated and equitable region.
- ❖ Region of diversified, consolidated economy and human capital for development.
- ❖ High quality of life region.
- ❖ Region of culture and heritage.

The Department of Tacna has the Concerted Regional Development Plan – “Tacna towards 2023” (PDRC), which is a long-term strategic planning management instrument that contributes to the achievement of objectives, actions, goals and the strategic road of the territory; Its main characteristics are: prospective, territorial - participatory and result approach, defining a development model for the entire Department of Tacna. [\[2\]](#)

In the PDRC, 6 key strategic axes have been identified to achieve social, economic, political and environmental changes in the territory of Tacna, which are:

- ❖ Fundamental personal rights and regional identity.
- ❖ Strengthening of human development and equal opportunities.
- ❖ State, governability and border integration.
- ❖ Competitive promotion of productive investment and service.
- ❖ Regional development and infrastructure
- ❖ Promotion of sustainable and environmental development.

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1 The objective image of the region is expressed in the following quote: “The Arica and Parinacota Region will be an integrated, sustainable and innovative two-border region, projecting itself through equitable, cohesive and competent human development, recognizing and cultivating cultural diversity of its people and heritage; based on the development of its potentialities and prioritizing with emphasis the economic productivity and the structural growth of its tourism, agriculture, services and commercial, industrial, cultural and social integration with the central zone of South America”. (ERD-2017-2030)

2 The vision of the region expressed in the PDRC, proposes "Tacna sustainable region with regional identity, attractive to productive investment and services, balanced water management and human development"

The comparison of the two strategic plans of Tacna and Arica and Parinacota show the existence of areas of common interest. In this context, to strengthen integration between the two regions, the following should be considered:

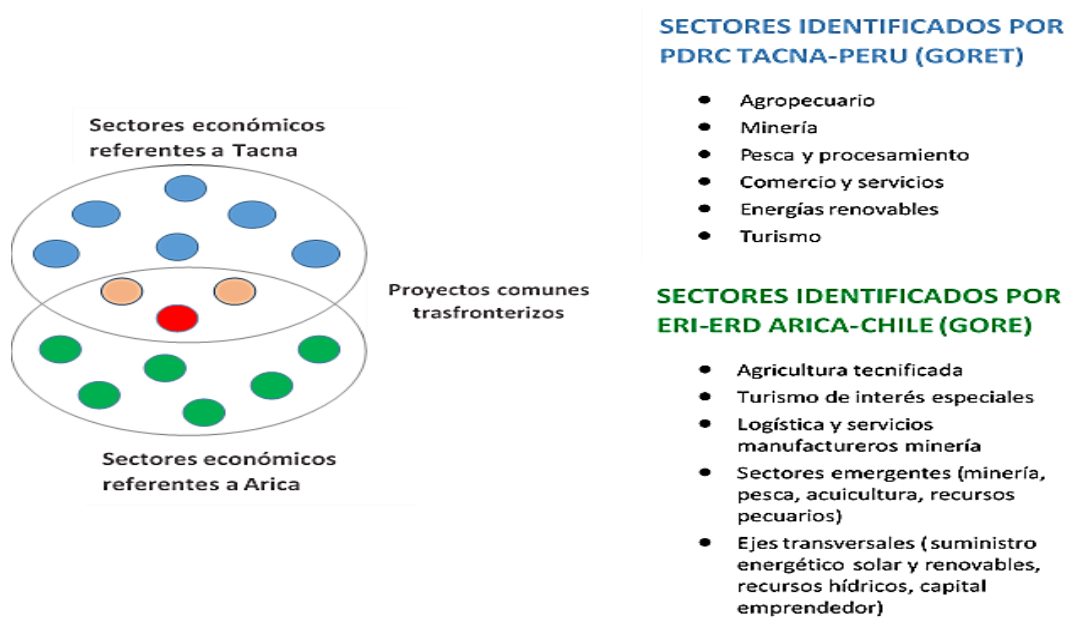
- The identification and prioritization of strategic cross-border economic sectors that can create more added value production chains.
- The definition of cross-cutting axes of shared regional development for prioritized economic sectors, whose articulation and intervention in parallel reinforces the development and support of actions in each of these sectors.

### 3. Identification and prioritization of cross-border economic sectors.

The regional development strategy for Arica and Parinacota 2017-2030, and the Concerted Development Plan for Tacna Towards 2023, identify sectors considered relevant in the economic activity of both border regions, which provide key elements for the design of the cross-border production system, since it allows the identification of economic areas of a similar nature, with respect to which it is necessary to establish the level of convergence possible to share, and the most important gaps to be addressed at short, medium and long term.

Figure 2 shows a mapping of identified priority sectors on both sides of the border and common areas between the two regions.

Figure 2. Sectors of economic development mentioned in public strategic planning instruments in the Arica and Parinacota Region



As to identify sectors to prioritize the strengthening of the cross-border production system, based on the current development and on the impact that could result in future stages, several meetings of a team of academic staff from both universities (UTA - UNJB) took place and they worked during 2019 on the design of the joint project. At the same time, the opinion of other experts of both study houses was consulted, in order to make a selection of those areas or sectors to be considered priorities in the design of the development plan of a cross - border system.

As a result of a first analysis, six possible areas that could produce major impact for productive development on both borders were identified, which are:

1. Agriculture.
2. Tourism - Associated services.
3. Mining.
4. Solar Energy / Geothermal .
5. Fishing (includes aquaculture).
6. Logistics and Related Manufacturing Services.

To identify those areas with the greatest potential, a simplified multi-criteria evaluation matrix was developed<sup>[3]</sup>. This allowed each sector to be analyzed in detail and compared on the basis of pre-established criteria, considering the strengths, opportunities and advantages of each sector, as well as the weaknesses, threats and disadvantages that could affect the development of alliances and actions of complementary development on both sides of the border.

To specify the convergences in each of the six proposed economic sectors, from a regional border analysis perspective, the same group of academic experts from UTA and UNGBG attributed a score to each of the sectors identified on a scale from 1 to 4, based on the criteria defined in the analysis. These were valorized to differentiate their relevance with respect to development prospect of the cross-border productive ecosystem. The results of the integration and crossing of the factors mentioned above are shown in Table 1.

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3 Multicriteria evaluation methodological handbook for programs and projects, Latin American and Caribbean Institute for Economic and Social Planning (ILPES), ECLAC handbook series, No. 58.

Table 1. Matrix for the selection of sectors to intervene in the Arica and Parinacota Region -TACNA Department.

Criteria	Weighing (5-10-15)	Regional Economic Sectors of Convergence					
		Agriculture	Tourism and services	Mining	Energy	Fishing	Logistics and services
Impact of the value chain on the economy of the border area.	15	4	4	2	3	1	2
Critical mass on both sides of the border	15	3	3	3	3	1	3
Existence of previous projects	10	3	3	1	2	1	1
Support to development priorities of local governments	10	4	3	2	3	2	2
Strengthens regional integration (convergence of cross-border initiatives).	15	4	4	2	4	2	1
Diversifies the economy and impacts intersectorially (growth potential and creation of new value).	10	4	4	2	3	2	2
It has high potential for cross-border cooperation, innovation and competitiveness of both regions under alliance.	15	4	4	2	3	2	2
Stimulates vertical business integration and creates new value between cities	5	2	2	1	2	1	1
Enables horizontal business integration and creates new value between cities	5	2	2	1	2	1	1
<b>Weighted score by sector</b>		<b>510</b>	<b>495</b>	<b>270</b>	<b>420</b>	<b>255</b>	<b>255</b>

In Table 1, the three economic sectors with the highest weighted scores are: agriculture (510), tourism (495) and energy (420). The agricultural sector is confirmed as the one with the greatest potential for cross-border integration, due to its natural conditions, previous experiences, growth potential and the possibility of creating alliances.

These results correspond to an analysis of both universities whose conclusion was to consider the three sectors with the highest score to be incorporated into the first phase of the Program of the Arica – Tacna System. The convergence and projections of complementary development at both sides of the border are key characteristics to create at short and medium time a faster impact through the development of alliances and effective associativity.

It is interesting to observe in figure 3 that there is a high coincidence and interrelation between the geographical areas and the economic sectors of both regions.

Figure 3. Interrelationship between geographical areas and economic sectors on the Peru-Chile border



Specifically, the role of the agricultural sector, within the framework of cross-border development, aims to create conditions for the development of competitive and efficient markets for agricultural goods and services, and reduce inequality and poverty, seeking synergies with linked private agents of the sector. The main engine that drives the successful growth of export agriculture and the diversification strategy has been the private sector. To achieve development and sustainable goals as well as to respond to new priorities and changing circumstances, it is necessary to maintain quality parameters and increase the availability of specialized human capital in the management of advanced agricultural technologies, required for the management of production processes in desert ecosystems, as well as address research processes associated with creation of new knowledge.



In the case of tourism, in both cities (Arica-Tacna) it is perceived that this sector presents an important potential, only partially exploited, which can represent a meeting point, to engender new developments and ventures, allowing complementary collaboration agreements between private and various organizations that are already linked and could lead to joint actions of greater relevance and impact<sup>[4]</sup>.

The importance of tourism between Tacna and Arica, has its own peculiarities and attractions, depending on the tourists choices and preferences according to age and gender, which not only positively affect the economy and have an impact on increase of employment and quality of the social environment on both sides of the border, but also as a result of this interaction between tourists, the destination area and the local population, there are a series of impacts that make the visit in both regions more attractive.

Regarding the energy sector, it focuses on the possibilities of energy development between both regions, with special emphasis on taking advantage of the solar energy and its derived applications, considering not to include other types of energy, as these are not part of the potentialities and competitiveness to be developed in Arica - Parinacota and Tacna. Although, complementary to solar energy, as a possible area for future cross-border development, the exploitation of geothermal resources has been considered, at a request of Peru, since there is a certain level of development in Tacna, but not in Arica - Parinacota, where its feasibility should be investigated.

Below the tables 2, 3 and 4 show a summary of the status of the three sectors proposed for targeting integration actions. It presents background information collected from the Regional Development Strategy 2017-2030 for the Arica and Parinacota Region, and the Concerted Regional Development Plan (PDRC) - Tacna Towards 2023. The content allows founding congruence, focus of shared development, and the complementary advantages regarding agriculture technology in the desert, tourism and associated services, and solar energy, as key areas considered for the development process of the Productive Ecosystem Arica-Tacna.

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<sup>4</sup> The opportunity and importance of elaborating a tourism brochure/booklet of Tacna Arica-Parinacota highlighting cross-border cultural landscapes, natural attractions and tourism potential, gastronomy, hotels and associated services has been considered as to identify trips of interest at accessible prices.

Table 2. Identification of opportunities in the Agricultural sector

Development area	Shared Development Focus	Advantages of the Arica-Parinacota Region	Advantages of the Department of Tacna
<p><b>Agro-technification in desert ecosystems</b></p>	<p>The <b>Tacna Plan</b> presents the optimal conditions for the generate and develop export-oriented agriculture.</p> <p>The <b>Arica and Parinacota Plan</b> promotes the strengthening of agricultural development.</p> <p>Both plans declare to have favorable weather conditions to develop agriculture, with the perspective of strengthening the development and promotion of the sector and its products outside of the regions.</p>	<p>Arica is the main tomato producer in Chile in the winter season (Off Season); in addition to other agricultural products throughout the year, such as: corn from LLuta valley, oregano, olives and various vegetables.</p> <p>There is an important level of specialization and human capital capacities regarding technical management of crops on land field and in greenhouses, in arid-desert environments, as well as a permanent advanced research program in soil and saline-boric water management.</p>	<p>Tacna has increasing demand and experience in the international market for agro-exportable products (olives, oregano, onion, paprika, melon, watermelon).</p> <p>Likewise, it promotes the articulation of agriculture of small and medium producers to a market economy, prioritizing a policy of development of irrigation infrastructure, sustainable management of natural resources and productive services.</p> <p>In addition, the <b>association</b> of agriculture producers is strengthened, promoting their integration into production chains of crops with agro-export potential.</p>

Table 3. Identification of opportunities in the Tourism sector

Development area	Shared Development Focus	Advantages of the Arica-Parinacota Region	Advantages of the Department of Tacna
<p><b>Tourism and associated services</b></p>	<p><b>The Tacna Plan</b> focuses on cultural heritage and tourism.</p> <p><b>The Arica and Parinacota Plan</b> promotes sustainable tourism development based on the natural and cultural heritage of the region.</p>	<p>Arica has various heritage, cultural and landscape attractions. Its museums of the Chinchorro Culture stand out, in which the oldest mummies in the world are exhibited. It has a coastal sector that includes the Anzota caves, attractive beaches with a modern waterfront.</p> <p>On the other hand, through an expedited access by road, it is possible to visit the foothills with various pre-Hispanic towns of high cultural appeal, Lake Chungará, one of the highest in the world, and the highlands at more than 4,500 meters above sea level., and landscapes of great beauty.</p>	<p>Tacna has high tourist potential. Among its attractions are the old civic center, including the cathedral, parabolic arch, and the Museum of the Railroad Tacna -Arica. It also has various dynamic market fairs, a great gastronomic offer and health services.</p> <p>Nearby it is possible to visit the Archaeological Complex of Miculla, the Historical Complex of Alto de la Alianza, the hot springs of Chillicopa and Calientes; expedited access and transfer to ethnic and adventure agro tourism areas, as well as beaches in the Los Palos and Boca del Rio area, are also available.</p>

Table 4. Identification of opportunities in the Energy sector

Development area	Shared Development Focus	Advantages of the Arica-Parinacota Region	Advantages of the Department of Tacna
Solar Energy	<p>The Tacna Plan promotes the conservation and sustainable use of natural resources and biodiversity.</p> <p>The Arica y Parinacota Plan promotes the development of sustainable energy sources such as solar energy in the perspective of its contribution to the regional energy matrix.</p>	<p>Arica, is located in one of the areas with the highest interception of solar radiation in the world. Important international companies have developed photovoltaic projects for the production of electrical energy. Along with the investment made by the country and private companies, in solar energy projects, studies have been carried out on water treatment by solar processes. This type of technology has allowed the development of important projects in the agricultural, aquaculture, livestock and tourist areas, especially in rural areas.</p>	<p>The Department of Tacna also has good solar and geothermal energy resources, one of the best in the country, which makes it an optimal region for the development of large-scale electric energy projects with photovoltaic and solar concentration systems. The stated potential of 200 MW of geothermal energy is also quite significant in the high andean zone of the region, with applications in ambient climatisation to mitigate abrupt freeze up temperatures, and for greenhouse crops, besides promoting andean ecotourism.</p>

#### 4. Cross-cutting axes of shared regional development

In the context of the development strategy of the Program, the implementation of activities around two transversal axes was considered of importance: cross-border integration and the development of human capital, aspects expressly indicated in the Regional Development Strategy 2017-2030, for the Arica and Parinacota Region, and in the Concerted Regional Development Plan (PDRC) - Tacna Towards 2023.

It should be noted that both transversal axes will have better results if associativity is promoted among the different stakeholders in the ecosystem.

Both axes have special relevance for the integrated development of the most potential areas: agriculture, tourism and solar energy, since they could contribute with a greater impact to the development of production chains, in addition to strengthening the actions of the stakeholders that participate in the productive system (private sector, government, academia). Both universities visualize in these guidelines the possibility of long-term actions and assistance of public and private institutions, linked to the process of strengthening the productive system of both regions. Table 5 presents a comparison of the strategic axes regarding the two transverse elements: border integration and development of human capital, both key targets for the universities.

Table 5. Comparison of common strategic axes of the Strategic Development Plans of Arica and Tacna.

Shared Strategic Axes	Arica and Parinacota Region	Tacna Department	Shared Development Focus
<b>Cross-border integration</b>	Arica and Parinacota: a socially integrated and equitable region.	State, Governance and cross-border integration.	These axes seek cross-border integration, on academic, student, scientific or productive level.
<b>Human capital development</b>	Arica and Parinacota: diversified and consolidated economic region with human capital for development.	Strengthening of human development and equal opportunities.	These axes aim to achieve human capital development for growth and sustainable development on both sides of the border.

Source: Regional Development Strategy 2017-2030 for the Arica and Parinacota Region and Concerted Regional Development Plan (PDRC) - Tacna by 2023.

## 5. Activities realized related to the project

### 5.1 INNOVACT (EU - CELAC)

Throughout the year 2019, the academic teams from the UTA and UNJBG universities have participated in activities scheduled in the INNOVACT II Project (3 presential and 2 online), which is in its final phase. It considered the development of a "Territorial Cohesion Platform", whose Action Plan was presented on November 22, 2018 in the city of Tacna, and which seeks to promote the development of Tourism and Smart Agriculture in the cities of Arica and Tacna. This program constitutes an important base for the cross-border intervention work that the project of both universities is considering to give continuity and expand the accomplished efforts.

The UTA-UNJBG project team participated in 2 presential workshops in Tacna: 1) Workshop on tourism value chain (May 2019); and 2) Development of International Projects (November 2019), as well as in an online workshop about structuring and diversification of value chains (July 2019).

### 5.2 UTA -YABT - CEPAL

In an effort to strengthen the Productive Ecosystem of Arica - Tacna, throughout the academia, a first workshop of InnovAcción (InnovAction) - Business Laboratory focused on innovation took place from September 23 to 27, 2019. It was addressed to Chilean-Peruvian and Bolivian students that study different careers or specific academic programs at the University of Tarapacá (UTA). The purpose of the workshop was »Young people to develop entrepreneurial skills and techniques to foster and manage innovation processes that address the common problems of their communities of origin«. The student selection process was in charge of the UTA and based on a series of criteria such as: their academic performance, commitment and special qualities to become Change Agents in the border region.

A series of successful cases were presented emphasizing competitive business management as an engine for territorial economic development. Four working groups were integrated and each of them designed a project with economic targets, submitted to an expert panel of representatives from private, academic and international sectors. At least two of the projects were qualified to be submitted to a Talent and Innovation Competition (TIC Americas) that takes place every year in a country of Latin America and the Caribbean, organized by the Young America s Business Trust (YABT).

## **6. Results**

A version of the document “Technical Assistance and Human Capital Development Program to promote the Productive Cross-border Ecosystem” has been written (UTA - UNJBG), which is not a final version, but represent important advances, particularly for its general framework. Actually, they are working on the three sections related to each of the selected intervention areas: (agriculture, tourism and energy).