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EU-Latin American Cooperation on Cross-Border (Brazil and Peru) Regional Innovation Systems in the framework of Regional Policy

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**EXECUTIVE SUMMARY**

With the overall aim of disseminating the experience of the EU's regional policy and its best practices, both in terms of innovation and cross-border cooperation, the "EU-Latin America Cooperation on Cross-Border Regional Innovation Systems in the framework of Regional Policy" project has promoted cooperation between authorities in the border regions of Peru and Brazil, and has identified the innovative sectors key to cooperation between the regions participating in the project. Selected were the regions of Loreto and San Martin, in Peru, and the State of Amazonas, in Brazil, which borders on the Peruvian region of Loreto. As a result of the work aquaculture was considered a field of economic activity boasting great potential and a basis upon which to bolster cross-border cooperation through the creation of an interregional aquaculture value chain. Based on the lessons learned through European experiences, and the results of collaboration with local stakeholders, a strategic approach was devised to guide actions at the regional level, making it possible to coordinate and align the different actors in the border area in light of the needs and opportunities posed by the aquaculture value chain as regards Cross-Border Cooperation (CBC), and the development of regions, their companies and peoples.

This final report commences with a socioeconomic diagnosis (social aspects related to the labour market and economic structure, including key activity sectors) of the regions of Loreto and San Martin (Peru) and the State of Amazonas (Brazil), including the Manaus Free Trade Zone.

It continues with a description of the R&D structure of the participating regions, more consolidated on the Brazilian side, but featuring a very great potential for cooperation.

In a first common diagnosis a series of areas for collaboration (shipbuilding, agriculture, ranching, timber, tourism, logistics) were identified. But the need was also detected to focus efforts on a specific area in order to further the CBC, prioritizing resources in the short and medium term. In this regard the aquaculture/fishing industry was considered to have great potential and to constitute one upon which more profound CBC could be implemented, aimed at contributing to the regional development of the three regions. The Amazon River links the regions of Loreto, in Peru, and the Brazilian municipalities of Atalaia, Benjamin Constant and Tabatinga, while the region of San Martin is crossed by the Huallaga River. Both river basins form the basis for the aquaculture activity in question. There are a good number of reasons for the perception of an opportunity to exploit aquaculture as a force driving the territorial development of this border region. A series of aspects were identified that characterise aquaculture in a set of territories in which Peru and Brazil feature socioeconomic similarities, such as low population density, remoteness and isolation from decision-making centres, the limited qualifications of the human resources available, the high percentage of indigenous peoples, the informality of their economies, and the scarcity or absence of R&D.

These regions also share the need to fortify the qualifications of the "social capital" engaged in the aquaculture sector. There is also a high rate of informality, which has a considerable impact, giving rise to market failures. The main problems include a weak corporate culture, poor transport and telecommunications infrastructures, and an inefficient energy system - a key resource affecting the costs and production capacities of the other economic activities. Worthy of special note is the lack of an established system to support R&D, oriented towards the needs of the business sector, and the limited technological development, which would make it possible to respond to the challenges posed by other areas, such as transport, logistics and energy.
The aquaculture sector boasts huge potential, having gone from producing nearly 50 million tonnes in 2006 to over 60 in 2011. It also has potential in the border regions, of great importance for poverty reduction through the creation of direct employment and in ancillary activities such as production, packaging marketing and distribution. It would generate major revenue, improve food security, and may have an important impact on the development of certain resources related to land, food, health, etc. In South America aquaculture has grown in recent years, specifically in Brazil and Peru, where people have made significant progress towards becoming aquaculture producers, with Brazil positioning itself as the third largest producer in the Americas.

Aquaculture is an activity representing an area of development for R&D, an aspect of great relevance to the selected territories, as only embryonic progress has been made in this regard to date. In Europe progress in R&D has spawned significant improvements in the efficiency of production systems and the quality of products, at the same time mitigating environmental impact, which is one of the main problems arising from aquaculture farms.

In fact, in Peru the “National Aquaculture Development Plan 2010-2021” establishes that each region is to formulate its own Regional Aquaculture Plan to promote the sector's development and to contribute to the meeting of national aquaculture development objectives. The goal of this national plan is “To promote the generation of the relevant human, material, technological, and financial resources, as well as the adequate technical services and institutional conditions to facilitate investment in aquaculture production and the commercialization of aquaculture products on the international market.”

In the region of San Martin (Peru) the "Strategic Framework for Aquaculture in the Region of San Martin," prepared by the Regional Government in 2013, presents the region's important conditions for the development of aquaculture in tropical waters, although their potential is not properly exploited. Therefore, a strategy has been designed to guide and support the sector in the region, in a sustainable way, incorporating it into regional planning, with the undertaking of various interventions and international projects to develop the sector through research and the production of fry, organisational strengthening through the development of local technology, capacity building and risk management plans for aquaculture species.

In the region of Loreto aquaculture began with a view to food security purposes and improving the living conditions of those who carried this activity informally. Over time it has gained in economic importance in the region and now receives support with regards to research, technology transfer, and the extension and promotion of the activity.

There are also experiences in Peru and Colombia involving the joint engagement in activities to promote aquaculture in border regions, in particular on the rivers between the two countries.

The Brazilian government, meanwhile, has focused in recent years on strengthening the institutional aspects of the fishing and aquaculture sector, focusing their policies on the criteria of sustainability, social inclusion, adequate production chain structure, the fortification of the domestic market, a territorial focus for the programs' management and development, and increased competitiveness.

In the northern region of Brazil aquaculture is still an emerging activity centring on the cultivation of freshwater fish. However, it boasts major potential for development, given the characteristics of the region, with abundant water resources, a favourable climate and a diversity of species that can be cultivated. However, this is not enough for aquaculture to take off in these territories, due to their distance from the capital and their regional isolation. Added to this is the problem of the acquisition of fry, and the lack of information and personnel technically qualified in the field of aquaculture. A very noteworthy initiative
taking place in the border regions of Peru is the *Rota do Pescado do Alto Solimões* project, supported and financed by the Ministry of National Integration, its main objective being "to promote regional development and socioeconomic inclusion through the productive structuring and economic integration of the country's least developed regions in national and international production, consumption and investment markets." In the State of Acre there is also a promising aquaculture effort: the "Fish Farming in the State of Acre Development Program," promoted by the government there. While this is not actually a territory included within the framework of the project, it is a border region with Peru, and has also contributed examples and good practices relevant to this project. The goal of the State of Acre is to become the leading region in aquaculture, featuring high productivity, limited environmental impact and quality production.

The Peru-Brazil Amazon Aquaculture Cluster Strategic Plan Framework includes a map that describes the value chain and geographical distribution of its critical mass. Four key areas are identified: a) the border vertex between Brazil, Peru and Colombia, with the towns of Leticia, Tabatinga and Benjamin Constant b) the border between Colombia and Peru, on the Putumayo strip, to the north of Loreto lying the province of Ramón Castilla and its main municipality, Caballococha c) the Region of Loreto, mainly the area of Iquitos.

This work has identified a number of knowledge-generating institutions for the Amazon Aquaculture Cluster (Universities and Research Institutes), located on both sides of the Peru/Brazil border.

A thorough SWOT analysis revealed a significant number of weaknesses, mainly related to personnel preparation and training, R&D and business capacity, governance and social capital (corporate culture, shared vision, institutions and types of relationships, etc.). The opportunities are significant, related to the nature and potential of the activity that is considered (aquaculture) to contribute to territorial development, the potential for the progressive introduction of technology, the complementarity of the three regions through the value chain, and the bases (still incipient) for more efficient governance, aligned with a strategic vision of the territorial development of the border area. The strengths and threats feature fewer noteworthy aspects, mainly related to the optimal nature of the territory (in the first case) and market failures and their consequences (in the second). To a large extent, the aspects included in this analysis are also applicable to the entire economic situation encompassing the project's three regions.

This paper proposes a strategy, taking as a starting point the internal aspects (weaknesses and strengths of the territory and activity) to take advantage of the opportunities and come up with a proposal so that the regions can define aquaculture-related policies and actions for the Peru/Brazil border area. An assessment has been carried out of the relative positioning of six strategic areas: the availability of technological, financial and environmental resources, and capacities in terms of education/training, social capital and governance.

The Amazon Aquaculture Cluster Strategic Plan aims to serve as a short and medium term (5-6 years) guide for a formal structure integrating the different agents in a progressive way, making it possible to systematize collaborative dynamics between them to meet the challenges involved in each of the six aspects considered strategic.

It features a core made up of the cluster's mission: to act as a representative forum for the sector, bolstering the competitiveness of aquaculture and other related activities through innovation, the sharing of best practices, the carrying out of joint cooperation projects, and acting in a coordinated and aligned manner to achieve a more favourable competitive framework. Its vision consists of positioning the aquaculture sector in the Amazon border area as an international landmark and establishing it as a forum for the improvement of competitiveness, raising the area's economic and social level and
preserving its environment in the context of a global economy based on value, differentiation and innovation.

Five strategic objectives have been set which, based on a SWOT analysis, seek to respond to the challenges that the cluster will face 1) promoting growth and competitiveness 2) cooperation and social capital 3) innovation, R&D, training and entrepreneurship 4) establishing a platform serving as a reference point 5) the cluster's full internationalisation. And a series of strategic lines that seek to achieve the objectives in the short and medium term: 1) cooperating to achieve economies of scale, a joint image and to exploit the synergies and benefits of the joint project 2) innovating to become a leader through value differentiation in unique and exclusive niches on the international markets 3) growing to achieve critical mass, sufficient representation and a predominant position vis-à-vis third parties internationally 4) internationalising to reach new, larger and more sophisticated and profitable markets, taking advantage of the opportunities offered by globalization.

Some projects are included that have emerged during the guidance work with the different agents forming the value chain that, foreseeably, could benefit the Cluster's formal structure. These projects, along with the strategic lines, are specified in milestones and indicators for the period. Of special note is that in several of these projects local actors have already identified possibilities for collaboration with European institutions and regions thanks to working visits to Europe, as well as the presence of regional representatives and European experts at conferences and seminars held in the Amazon regions over the course of the project.

Finally, based on the European experience in the promotion of the interregional cooperation process, a governance proposal is included for the formal structure of the Cross-Border Aquaculture Cluster through non-profit, private or public/private entities, in addition to a proposed timetable for the implementation of the strategic guidelines.

In general terms the evidence indicates an activity with enormous potential, known and accepted by the communities and the different administrative levels, and in which experience is harboured, albeit informal. In the current context of an effort to promote cross-border integration, it could easily become a cross-border cluster laboratory functioning as a model and inspiration for other Latin American processes, and on other continents. To achieve this all that is necessary is to implement the strategy proposed here, including a guarantee of adequate capacity generation, critical technology transfer, and the allotment of the necessary financial resources.
RESUMO EXECUTIVO

Com o objetivo geral de divulgar a experiência da política regional da UE e suas práticas recomendadas tanto no que diz respeito à inovação como à cooperação transfronteiriça, o projeto “Cooperação UE-América Latina sobre Sistemas Regionais de Inovação Transfronteiriça no âmbito da Política Regional” fomentou a cooperação entre autoridades das regiões fronteiriças do Peru e do Brasil e identificou os principais setores inovadores para a cooperação entre as regiões participantes do projeto. Foram selecionadas as regiões de Loreto e San Martín, no Peru, e o estado de Amazonas, no Brasil, que faz fronteira com a região peruana de Loreto. Como resultado do trabalho, a aquicultura foi considerada como uma atividade econômica com um importante potencial e como base para impulsionar a cooperação transfronteiriça através da criação de uma cadeia de valor aquícola inter-regional. A partir das lições aprendidas das experiências europeias e dos resultados da colaboração com os atores locais, chegou-se a uma abordagem estratégica para orientar as ações em nível regional que permitam coordenar e alinhar os diferentes agentes da zona fronteiriça em torno das necessidades e oportunidades que apresenta a cadeia de valor da aquicultura no que diz respeito à Cooperação Transfronteiriça (CTF) e de desenvolvimento das regiões, empresas e população vinculadas.

Este relatório final inicia com um diagnóstico socioeconômico (aspectos sociais relacionados com o mercado de trabalho e da estrutura econômica, incluindo os principais setores de atividade) das regiões de Loreto e San Martín (Peru) e do estado de Amazonas (Brasil), incluindo a zona franca de Manaus.

Continua com uma descrição da estrutura de Pesquisa e Desenvolvimento (P&D) das regiões participantes, mais consolidada no lado brasileiro, mas com um potencial de cooperação muito elevado.

Em um primeiro diagnóstico comum, foi identificada uma série de âmbitos para a colaboração (construção naval, agricultura, pecuária, madeira, turismo, logística). Porém, também viu-se a necessidade de concentrar os esforços em uma temática concreta para poder avançar na CTF, priorizando os recursos em curto e médio prazo. A respeito disso, a atividade aquícola-pesqueira foi considerada como um setor de grande potencial e sobre o qual poderia ser realizada uma CTF mais profunda, voltada a contribuir para o desenvolvimento territorial das três regiões. O rio Amazonas une as regiões de Loreto, no Peru, e os municípios brasileiros de Atalaia, Benjamin Constant e Tabatinga, enquanto que a região de San Martín é atravessada pelo rio Huallaga. Ambas as bacias são a base para o desenvolvimento da atividade aquícola. Há um bom número de razões que apontam para a oportunidade de basear-se na aquicultura como atividade motora do desenvolvimento territorial desta região transfronteiriça e também se identificou uma série de aspectos que caracterizam a atividade aquícola dos territórios que, no Peru e no Brasil, compartilham semelhanças socioeconômicas, como a baixa densidade populacional, a distância e o isolamento em relação aos centros de decisão, o baixo nível de qualificação dos recursos humanos, o alto percentual de população indígena, a informalidade da economia ou o escasso desenvolvimento e presença de P&D.

Estas regiões também compartilham a necessidade de aumentar a qualificação do capital social vinculado ao setor aquícola. Há também uma elevada taxa de informalidade, o que tem repercussões consideráveis e produz falhas no mercado. Entre os principais problemas, destacam-se a escassa cultura empresarial, uma deficiente infraestrutura de comunicações e telecomunicações ou o ineficiente sistema de energia, um recurso fundamental que age sobre os custos e a capacidade produtiva do resto de atividades econômicas. Deve ser destacada a falta de um sistema de apoio à P&D consolidado e voltado para as necessidades do tecido empresarial e o escasso desenvolvimento tecnológico que permitiria responder aos desafios propostos em outros âmbitos, como o transporte e a logística ou a energia.

O setor aquícola tem um enorme potencial, tendo passado de produzir quase 50 milhões de toneladas em 2006 a passar de 60 milhões em 2011. Também o tem nas regiões fronteiriças, com grande importância para a redução da pobreza através da criação de
empregos diretos e em atividades auxiliares, como a elaboração, a embalagem ou a comercialização e distribuição. Gera maior entrada de divisas, melhora a segurança alimentar e pode ter importantes vínculos para o desenvolvimento de determinados recursos vinculados ao território, à gastronomia, à saúde, etc. Na América do Sul, a aquicultura cresceu nos últimos anos, também no Brasil e no Peru, sendo que foram realizados importantes avanços para converter-se em produtores aquícolas, o que, no caso do Brasil, o levou a posicionar-se como terceiro produtor do continente americano.

A aquicultura é uma atividade que constitui um campo de desenvolvimento para a P&D, aspecto de grande relevância para os territórios selecionados, dado que seu nível de P&D ainda é incipiente. Na Europa, os avanços em P&D representaram melhorias consideráveis na eficiência dos sistemas produtivos e na qualidade dos produtos, ao mesmo tempo em que é minimizado o impacto ambiental, que é um dos principais problemas derivados das explotações aquícolas.

De fato, no Peru, o "Plan Nacional de Desarrollo Acuícola 2010-2021" estabelece que cada região deve formular seu próprio Plano Regional de Aquicultura para impulsionar o desenvolvimento do setor e cumprir o objetivo de contribuir para as metas nacionais de desenvolvimento aquícola. O objetivo desse plano nacional é “Promover a geração dos recursos humanos, materiais, tecnológicos e financeiros pertinentes, assim como os serviços técnicos e condições institucionais adequados, para facilitar o investimento privado na produção aquícola e comercialização de produtos da aquicultura no mercado internacional”.

Na região de San Martín (Peru), o documento “Marco Estratégico para la Acuicultura de la Región de San Martín”, elaborado pelo Governo Regional em 2013, apresenta a região com importantes condições para o desenvolvimento da aquicultura em águas tropicais, embora seu potencial não seja adequadamente aproveitado. Por isso, foi projetada uma estratégia que sirva como guia e apoio para desenvolver de forma sustentável o setor na região, incorporando-o à planificação regional e sendo desenvolvidas várias intervenções e também alguns projetos internacionais para desenvolver o setor através da pesquisa e produção de alevinos, o fortalecimento organizativo por meio do desenvolvimento de tecnologia local, o desenvolvimento de capacidades e os planos de manejo de risco das espécies aquícolas.

Na região de Loreto, a atividade aquícola foi iniciada com fins de segurança alimentar e de melhoria das condições de vida dos que desenvolviam essa atividade de maneira informal. Com o tempo, foi adquirindo maior importância econômica na região e conta com o apoio em temas de pesquisa, transferência de tecnologia, extensão e fomento de atividade.

Também existem experiências entre Peru e Colômbia no desenvolvimento conjunto de atividades para impulsionar a aquicultura nas regiões fronteiriças e, em particular, nos rios na fronteira entre ambos os países.

Por sua vez, o Governo do Brasil concentrou-se, nos últimos anos, em reforçar a institucionalização do setor pesqueiro e aquícola, enfocando suas políticas nos critérios de sustentabilidade, inclusão social, estrutura adequada da cadeia de produção, fortalecimento do mercado interno, enfoque territorial para a gestão e o desenvolvimento de programas ou aumento da competitividade.

Na região Norte do Brasil, a aquicultura ainda é uma atividade incipiente e voltada para o cultivo de peixes de água doce. No entanto, tem um potencial de desenvolvimento muito importante devido às características da região, com abundantes recursos hídricos, clima favorável e diversidade de espécies com potencial de cultivo. Não obstante, isso não é suficiente para que a aquicultura decole nesses territórios devido à sua distância em relação à capital e ao seu isolamento regional. A isto, soma-se o problema para a aquisição dos alevinos e a falta de informação e de pessoal técnico qualificado em aquicultura. Uma iniciativa de grande interesse que está sendo realizada nas regiões fronteiriças com o Peru é a "Rota do Pescado do Alto Solimões", apoiada e financiada pelo Ministério de Integração Nacional e que tem como principal objetivo “promover o desenvolvimento regional e a inclusão socioeconômica por meio de uma estruturação produtiva e integração econômica".
das regiões menos desenvolvidas do país nos mercados nacionais e internacionais de produção, consumo e investimento”. No estado do Acre, existe também uma interessante experiência em matéria aquícola: o “Programa de Desenvolvimento da Piscicultura no Estado do Acre”, impulsionado pelo Governo estadual. Embora este não seja, em princípio, um território selecionado no âmbito do projeto, é uma região fronteiriça com o Peru e, além disso, serviu de exemplo ou prática recomendada para este trabalho. O objetivo do estado do Acre é transformar-se na região de referência em aquicultura de alta produtividade, baixo impacto ambiental e produção de qualidade.

O âmbito do Plano Estratégico do Cluster Aquícola da Amazônia Peru-Brasil inclui um mapa que descreve a cadeia de valor e a distribuição geográfica da massa crítica do mesmo. Distinguem-se quatro zonas principais: a) o vértice fronteiriço entre Brasil, Peru e Colômbia, com os núcleos urbanos de Leticia, Tabatinga e Benjamin Constant; b) a fronteira entre Colômbia e Peru da faixa do Putumayo, onde se localiza ao norte de Loreto a província de Ramón Castilla e seu principal município, Caballococha; c) a região de Loreto, principalmente a área de Iquitos.

Neste trabalho, foi identificada uma série de instituições geradoras de conhecimento para o Cluster Aquícola da Amazônia (Universidades e Institutos de Pesquisa), distribuídos em ambos os lados da fronteira peruana e brasileira.

Foi realizada uma análise DAFO profunda, que evidenciou um número significativo de pontos fracos, vinculados fundamentalmente à capacitação e formação das pessoas, à P&D e à capacidade empresarial, e à governança e ao capital social (cultura empresarial, visão conjunta, instituições e tipologia de relações, etc.). As oportunidades são significativas, vinculadas à natureza e potencial da atividade considerada (aquicultura) para contribuir para o desenvolvimento territorial, o potencial da introdução progressiva de tecnologia, a complementaridade das três regiões em torno à sua cadeia de valor e as bases (ainda incipientes) de uma governança mais eficiente e alinhada com a visão estratégica do desenvolvimento territorial da área transfronteiriça. Os pontos fortes e ameaças contam com um número menor de aspectos destacados e estão vinculados fundamentalmente à natureza ideal do território (no primeiro caso) e às falhas de mercado e suas consequências derivadas (no segundo caso). Em grande medida, os aspectos incluídos nesta análise também são extensíveis ao conjunto da realidade econômica das três regiões do projeto.

Neste trabalho, propõe-se uma estratégia, tomando como ponto de partida os aspectos internos (pontos fortes e fracos do território e da atividade), para aproveitar as oportunidades e chegar a uma proposta para que as regiões definam uma política e as atuações na área transfronteiriça Peru-Brasil sobre a aquicultura. Foi realizada uma avaliação do posicionamento relativo de seis aspectos estratégicos: a disponibilidade de recursos tecnológicos, financeiros e ambientais, e as capacidades em termos de formação/capacitação, capital social e governança.

O Plano Estratégico do Cluster Aquícola da Amazônia pretende servir de guia em curto e médio prazo (5 e 6 anos) para uma estrutura formal que integre os diferentes agentes de forma progressiva e permita sistematizar dinâmicas colaborativas entre eles para responder aos desafios de cada um dos 6 aspectos considerados como estratégicos.

Conta com um núcleo formado pela missão do cluster: agir como um fórum representativo do setor, contribuindo para a melhoria competitiva da atividade aquícola e outras relacionadas através da inovação, compartilhando práticas recomendadas, desenvolvendo projetos de colaboração conjuntos e atuando de forma coordenada e alinhada para obter um âmbito competitivo mais favorável. A visão do mesmo consiste em posicionar o setor da aquicultura na zona fronteiriça da Amazônia como uma referência de nível internacional, consolidando-se como fórum de melhoria da competitividade que contribua para elevar o nível econômico e social, e para preservar o meio desta zona no âmbito de uma economia global baseada no valor, na diferenciação e na inovação.

São descritos cinco objetivos estratégicos que, a partir do DAFO, tratam de responder aos desafios identificados que enfrentará o cluster: 1) promover o crescimento e a competitividade, 2) cooperação e capital social, 3) inovação, P&D, capacitação e
empreendimento, 4) configurar uma plataforma de referência, 5) plena internacionalização do cluster. É uma série de linhas estratégicas que procuram materializar e alcançar os objetivos em curto e médio prazo: 1) cooperar para obter economias de escala, uma imagem conjunta e explorar as sinergias e benefícios da colaboração, 2) inovar para transformar-se em uma referência, por meio da diferenciação do valor em nichos únicos e exclusivos nos mercados internacionais, 3) crescer para obter massa crítica, uma representação suficiente e uma posição predominante perante terceiros em nível internacional, e 4) internacionalizar para alcançar novos mercados maiores, mais sofisticados e rentáveis, e aproveitar as oportunidades da globalização.

São incluídos também alguns projetos que surgiram durante os trabalhos de tutorização com os diferentes agentes que integram a cadeia de valor e que previsivelmente poderiam trabalhar na estrutura formal do Cluster. Esses projetos, juntamente com as linhas estratégicas, concretizam-se em marcos e indicadores para o período. Deve destacar-se que, em vários desses projetos, os atores locais já identificaram diferentes possibilidades de colaboração com instituições e regiões europeias graças às visitas de trabalho que foram feitas na Europa, assim como a presença de representantes regionais e especialistas europeus nas conferências e seminários realizados nas regiões amazônicas ao longo do projeto.

Finalmente, e a partir da experiência europeia na promoção do processo de cooperação inter-regional, também é incluída uma proposta de governança para a estrutura formal do Cluster Aquícola Transfronteiriço através de figuras privadas ou público-privadas sem fins lucrativos, além de uma proposta de cronograma para a implementação das linhas estratégicas.

Em geral, evidencia-se uma atividade com um enorme potencial, conhecida e aceita pelas comunidades e pelos diferentes níveis administrativos, que conta com uma experiência adquirida, embora de maneira informal, e que, na conjuntura atual de impulso à integração fronteiriça, pode transformar-se facilmente em um laboratório de cluster transfronteiriço que sirva de modelo e inspiração para outros processos latino-americanos e em outros continentes. Para tanto, somente é necessário implementar a estratégia aqui proposta, incluindo a garantia da suficiente geração de capacidades, a determinante transferência tecnológica e a necessária alocação de recursos financeiros.
RESUMEN EJECUTIVO

Con el objetivo general de difundir la experiencia de la política regional de la UE y sus buenas prácticas tanto en lo que se refiere a la innovación como a la cooperación transfronteriza, el proyecto “Cooperación UE-América Latina sobre Sistemas Regionales de Innovación Transfronterizos en el marco de la Política Regional” ha fomentado la cooperación entre autoridades de las regiones fronterizas de Perú y Brasil, ay ha identificado los sectores innovadores clave para la cooperación entre las regiones participantes en el proyecto. Se seleccionaron las regiones de Loreto y San Martín en Perú y el Estado de Amazonas de Brasil, que hace frontera con la región peruana de Loreto. Como resultado del trabajo se consideró la acuicultura como una actividad económica con un importante potencial y como base para impulsar la cooperación transfronteriza a través de la creación de una cadena de valor acuícola interregional. A partir de las enseñanzas obtenidas de las experiencias europeas, y de los resultados de la colaboración con los actores locales, se llegó a un planteamiento estratégico para orientar las acciones a nivel regional que permitan coordinar y alinear a los diferentes agentes de la zona fronteriza en torno a las necesidades y oportunidades que presenta la cadena de valor de la acuicultura en materia de Cooperación Transfronteriza (CTF) y de desarrollo de las regiones, empresas y población vinculadas.

Este informe final se inicia con un diagnóstico socioeconómico (aspectos sociales, relacionados con el mercado laboral y de la estructura económica, incluyendo los principales sectores de actividad), de las regiones de Loreto y San Martín (Perú) y del Estado de Amazonas (Brasil), incluyendo la zona franca de Manaos.

Continúa con una descripción de la estructura de Investigación y Desarrollo (I+D) de las regiones participantes, más consolidada en el lado brasileño, pero con un potencial de cooperación muy elevado.

En un primer diagnóstico común se identificaron una serie de ámbitos para la colaboración (construcción naval, agricultura, ganadería, madera, turismo, logística). Pero también se vio la necesidad de centrar los esfuerzos en una temática concreta para poder avanzar en la CTF, priorizando los recursos a corto y medio plazo. A este respecto, se consideró la actividad acuícola-pesquera como sector de gran potencial y sobre el que podría llevarse a cabo una CTF más profunda dirigida a contribuir al desarrollo territorial de las tres regiones. El río Amazonas une las regiones de Loreto, en Perú y los municipios brasileños de Atalaia, Benjamín Constant y Tabatinga, mientras que la región de San Martín es cruzada por el río Huallaga. Ambas cuencas son la base para el desarrollo de la actividad acuícola. Hay un buen número de razones que apuntan a la oportunidad de basarse en la acuicultura como actividad tractora del desarrollo territorial de esta región transfronteriza, y también se ha identificado una serie de aspectos que caracterizan la actividad acuícola de unos territorios que comparten en Perú y Brasil similitudes socioeconómicas como la baja densidad poblacional, la lejanía y aislamiento con respecto a los centros de decisión, el bajo nivel de cualificación de los recursos humanos, el alto porcentaje de población indígena, la informalidad de la economía o el escaso desarrollo tecnológico que permitiría...
responder a los retos planteados en otros ámbitos como el transporte y la logística o la energía.

El sector acuícola tiene un enorme potencial habiendo pasado de producir casi 50 millones de toneladas en 2006 a pasar de las 60 en 2011. También lo tiene en las regiones fronterizas, con gran importancia para la reducción de la pobreza a través de la creación de empleos directos y en actividades auxiliares como la elaboración, el empaquetado o la comercialización y distribución. Genera mayor ingreso de divisas, mejora la seguridad alimentaria y puede tener importantes vínculos para el desarrollo de ciertos recursos vinculados al territorio, la gastronomía, la salud, etc. En América del Sur la acuicultura ha crecido en los últimos años, también en Brasil y Perú, habiéndose realizado importantes avances para convertirse en productores acuícolas lo que, en el caso de Brasil, le ha llevado a posicionarse como el tercer productor del continente americano.

La acuicultura es una actividad que supone un campo de desarrollo para la I+D, aspecto de gran relevancia para los territorios seleccionados ya que su nivel de I+D es aún incipiente. En Europa, los avances en I+D han supuesto mejoras considerables en la eficiencia de los sistemas productivos y en la calidad de los productos a la vez que se minimiza el impacto ambiental, que es uno de los principales problemas derivados de las explotaciones acuícolas.

De hecho, en Perú el "Plan Nacional de Desarrollo Acuícola 2010-2021" establece que cada región debe formular su propio Plan Regional de Acuicultura para impulsar el desarrollo del sector y cumplir con el objetivo de contribuir a las metas nacionales de desarrollo acuícola. El objetivo de este plan nacional es "Promover la generación de recursos humanos, materiales, tecnológicos y financieros pertinentes, así como los servicios técnicos y condiciones institucionales adecuadas, para facilitar la inversión privada en la producción acuícola y comercialización de productos de la acuicultura en el mercado internacional".

En la región de San Martín (Perú) el documento “Marco Estratégico para la Acuicultura de la Región de San Martín” elaborado por el Gobierno Regional en 2013, presenta a la región con importantes condiciones para el desarrollo de la acuicultura en aguas tropicales, aunque sus potencialidades no se aprovechan adecuadamente. Por ello, se ha diseñado una estrategia que sirva de guía y apoyo para desarrollar de manera sostenible el sector en la región, incorporándolo a la planificación regional y desarrollándose varias intervenciones y también algunos proyectos internacionales para desarrollar el sector a través de la investigación y producción de alevines, el fortalecimiento organizativo mediante el desarrollo de tecnología local, el desarrollo de capacidades y los planes de manejo de riesgo de las especies acuícolas.

En la región de Loreto la actividad acuícola se inició con fines de seguridad alimentaria y de mejora de las condiciones de vida de quienes desarrollaban esta actividad de manera informal. Con el tiempo ha ido adquiriendo mayor importancia económica en la región y cuenta con el apoyo en temas de investigación, transferencia de tecnología, extensión y fomento de actividad.

También existen experiencias entre Perú y Colombia en el desarrollo conjunto de actividades para impulsar la acuicultura en las regiones fronterizas y, en particular, en los ríos en la frontera entre ambos países.

Por su parte, el Gobierno de Brasil se ha concentrado en los últimos años en reforzar la institucionalidad del sector pesquero y acuícola, centrándose en las políticas en los criterios de sostenibilidad, inclusión social, adecuada estructura de la cadena de producción, fortalecimiento del mercado interno, enfoque territorial para la gestión y el desarrollo de programas o incremento de la competitividad.
En la región Norte de Brasil la acuicultura es todavía una actividad incipiente y centrada en el cultivo de peces de agua dulce. Sin embargo, tiene un potencial de desarrollo muy importante dadas las características de la región con abundantes recursos hídricos, clima favorable y diversidad de especies con potencial de cultivo. No obstante, esto no es suficiente para que la acuicultura despegue en estos territorios debido a su lejanía de la capital y su aislamiento regional. A esto se une el problema para la adquisición de los alevines y la falta de información y de personal técnico cualificado en acuicultura. Una iniciativa de gran interés que se está llevando a cabo en las regiones fronteras con Perú, es la “Rota do Pescado do Alto Solimões”, apoyada y financiada por el Ministerio de Integración Nacional y teniendo como principal objetivo “promover el desarrollo regional y la inclusión socioeconómica por medio de una estructuración productiva e integración económica de las regiones menos desarrolladas del país en los mercados nacionales e internacionales de producción, consumo e inversión”. En el Estado de Acre, existe también una interesante experiencia en matera acuícola: el “Programa de Desarrollo de la Piscicultura en el Estado de Acre” impulsado por el Gobierno estadual. Si bien, este no es en principio un territorio seleccionado en el marco del proyecto, sí que es una región fronteriza con Perú y además, sirvió como ejemplo o buena práctica para este trabajo. El objetivo del Estado de Acre es convertirse en la región de referencia en acuicultura de alta productividad, bajo impacto ambiental y producción de calidad.

El Marco del Plan Estratégico del Clúster Acuícola de la Amazonía Perú-Brasil, incluye un mapa que describe la cadena de valor y la distribución geográfica de la masa crítica del mismo. Se distinguen cuatro zonas clave: a) el vértice fronterizo entre Brasil, Perú y Colombia con los núcleos urbanos de Leticia, Tabatinga y Benjamín Constant; b) la frontera entre Colombia y Perú de la franja del Putumayo, donde se localiza al norte de Loreto la provincia de Ramón Castilla y su principal municipalidad Caballococha; c) la Región de Loreto, principalmente el área de Iquitos.

En este trabajo se ha identificado una serie de instituciones generadoras de conocimiento para el Clúster Acuícola de la Amazonía (Universidades e Institutos de Investigación), repartidos a ambos lados de la frontera peruana y brasileña.

Se realizó un profundo análisis DAFO, que evidenció un número significativo de debilidades, vinculadas fundamentalmente a la capacitación y formación de las personas, a la I+D y la capacidad empresarial, y la gobernanza y el capital social (cultura empresarial, visión conjunta, instituciones y tipología de relaciones, etc.). Las oportunidades son significativas, vinculadas a la naturaleza y potencial de la actividad que se considera (acuicultura) para contribuir al desarrollo territorial, el potencial de la introducción progresiva de tecnología, la complementariedad de las tres regiones en torno a su cadena de valor, y las bases (aún incipientes) de una gobernanza más eficiente y alineada con la visión estratégica del desarrollo territorial del área transfronteriza. Las fortalezas y amenazas cuentan con un menor número de aspectos destacables, y vinculadas fundamentalmente a la naturaleza óptima del territorio (en el primer caso) y a los fallos de mercado y sus consecuencias derivadas (en el caso del segundo). En gran medida, los aspectos incluidos en este análisis son extensibles además al conjunto de la realidad económica de las tres regiones del proyecto.

En este trabajo se propone una estrategia, tomando como partida los aspectos internos (debilidades y fortalezas del territorio y la actividad), para aprovechar las oportunidades y llegar a una propuesta para que las regiones definan una política y actuaciones en el área transfronteriza de Perú-Brasil sobre la acuicultura. Se ha realizado una valoración sobre el posicionamiento relativo de seis aspectos estratégicos: la disponibilidad de recursos tecnológicos, financieros y de entorno, y las capacidades en materia de formación/capacitación, capital social y gobernanza.
El Plan Estratégico del Clúster Acuícola de la Amazonía pretende servir de guía a corto y medio plazo (5 y 6 años) para una estructura formal que integre a los diferentes agentes de manera progresiva y permita sistematizar dinámicas colaborativas entre ellos para responder a los retos de cada uno de los 6 aspectos considerados como estratégicos.

Cuenta con un núcleo conformado por la misión del clúster: actuar como un foro representativo del sector, contribuyendo a la mejora competitiva de la actividad acuícola y otras relacionadas a través de la innovación, compartiendo buenas prácticas, desarrollando proyectos de colaboración conjuntos y actuando de manera coordinada y alineada para conseguir un marco competitivo más favorable. La visión del mismo consiste en posicionar al sector de la acuicultura en la zona fronteriza de la Amazonía como un referente a nivel internacional consolidándose como foro de mejora de la competitividad que contribuya a elevar el nivel económico y social, y preservar el medio de esta zona en el marco de una economía global basada en el valor, la diferenciación y la innovación.

Se describen cinco objetivos estratégicos que, a partir del DAFO tratan de responder a los retos identificados a los que se enfrentará el clúster: 1) promover el crecimiento y la competitividad, 2) cooperación y capital social, 3) innovación, I+D, capacitación y emprendimiento, 4) configurar una plataforma de referencia, 5) plena internacionalización del clúster. Y una serie de líneas estratégicas que buscan materializar y alcanzar los objetivos a corto y medio plazo: 1) cooperar para lograr economías de escala, una imagen conjunta y explotar las sinergias y beneficios de la puesta en común, 2) innovar para convertirse en referente, mediante la diferenciación del valor en nichos únicos y exclusivos en los mercados internacionales, 3) crecer para lograr masa crítica, una representación suficiente y una posición predominante frente a terceros a nivel internacional, y 4) internacionalizar para alcanzar nuevos mercados más grandes, sofisticados y rentables y aprovechar las oportunidades de la globalización

Se incluyen además algunos proyectos que han surgido durante los trabajos de tutorización con los diferentes agentes que integran la cadena de valor y que previsiblemente podrían trabajar en la estructura formal del Clúster. Estos proyectos junto a las líneas estratégicas se concretan en hitos e indicadores para el periodo. Es de destacar que en varios de esos proyectos los actores locales han identificado ya distintas posibilidades de colaboración con instituciones y regiones europeas gracias a las visitas de trabajo que se hicieron a Europa, así como a la presencia de representantes regionales y expertos europeos en las conferencias y seminarios llevados a cabo en las regiones amazónicas a lo largo del proyecto.

Finalmente, y a partir de la experiencia europea en la promoción del proceso de cooperación interregional, se incluye también una propuesta de gobernanza para la estructura formal del Clúster Acuícola Transfronterizo a través de figuras privadas o público-privadas sin ánimo de lucro, y una propuesta de cronograma para la puesta en marcha de las líneas estratégicas.

En general, se evidencia una actividad con un enorme potencial, conocida y aceptada por las comunidades y por los distintos niveles administrativos, que cuenta con una experiencia adquirida, aunque sea de manera informal y que, en la coyuntura actual de impulso a la integración fronteriza, puede convertirse fácilmente en un laboratorio de clúster transfronterizo que sirva de modelo e inspiración para otros procesos latinoamericanos y en otros continentes. Para ello sólo es necesario poner en marcha la estrategia que aquí se propone, incluyendo la garantía de la suficiente generación de capacidades, la determinante transferencia tecnológica y la necesaria dotación de recursos financieros.
**Introduction**

The overall objective of the "EU-Latin America Cooperation on Regional Cross-Border Innovation Systems within the Framework Regional Policy" project has been to share the EU's experience in terms of regional policy and its good practices, both with regards to innovation and cross-border cooperation. The intention was to take advantage of the know-how acquired in Europe to define and implement measures to promote cooperation between the authorities in the border regions of Peru and Brazil, as well as to identify key innovative sectors for cooperation between the regions participating in the project. In addition, taking advantage of working visits to Europe and the presence of regional representatives and European experts, the aim was to generate fluid relations so that future project execution could benefit from corporate collaboration and European technological support.

For the implementation of the project the regions of Loreto and San Martin, in Peru, and the State of Amazonas, in Brazil, which borders on the Peruvian region of Loreto, were selected.

As a result of the work, aquaculture was identified as an economic activity with great potential, capable of forming the foundation to promote cross-border cooperation through the creation of an interregional aquaculture value chain.

Consequently, this document presents a strategic approach to guide actions at the regional level to coordinate and align the different stakeholders in the cross-border area (with priority assigned to San Martin, Loreto and the State of Amazonas) with a view to the needs and opportunities of the aquaculture value chain cross-border cooperation, and the development of the regions, businesses and peoples operating in them, following the lessons learned from Europe's over half a century of experience.

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**Example 1: Establishment of cross-border structures for the joint execution of projects between neighbouring regions separated by national borders**

In Europe work began by building Euroregions between local authorities, like Private Law entities (in the 50s and 60s). Then came Work Communities and Eurodistricts, in the 80s and 90s, leading up to the European Public Law instrument: the European Groupings of Territorial Cooperation (EGTC) in 2006 (more information can be found on the AEBR Map on CBC in Europe (2011) and the online CBC Knowledge Platform on the AEBR website.

Source: Association of European Border Regions (AEBR), 2011 (own elaboration)
1/ THE REGIONS OF LORETO AND SAN MARTÍN (PERU)

1.1/ Socioeconomic Diagnosis of the Region of Loreto

1.1.1 / Social Aspects

The Department of Loreto is the largest (369,000 km²) of the 24 making up the Republic of Peru. Located in the country's north, it borders on Ecuador, Colombia and Brazil.

Its population is estimated at 1,028,9681, accounting for 3.4% of the country's total. Iquitos (the capital of the department) is the most populous city, with 422,055 people2; 60-80% of inhabitants are indigenous people or have some indigenous ancestry.

The region features a very young population, with those ages 0-24 making up half the people (53%), while those over 50 account for just 13.5%.

At the educational level, although the Department of Loreto has a relatively low illiteracy rate (4.4%), less than 10% have university educations.3

In terms of years of schooling (amongst those 25 and older) the average is 8.09 years, below the national average of 9 years, which places the region of Loreto at No. 13 in the national ranking.

The trend in terms of the Human Development Index indicates positive development from 2003 to 2012, both in the region of Loreto and across the country. But on the HDI ranking the region of Loreto fell from 15th, in 2003, to 17th in 2012.

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1 Data from the INEI, 28 April 2014 (Peru, by the numbers)
2 2012 INEI Data.
3 INEI data for 2012.
1.1.2/ Labour Market

The labour market is relatively dynamic, but with rates of employment and activity that are not very high. The economically employed population in 2012 reached 48% of the total population, with 485,000 people, while the active population reached 510,000 people (49.7% of the total population. The unemployment rate stood at 1.5% of the active population (15,300 people), a very low rate that is due, at least in part, to the many people who are not looking for work because they are employed in the informal (underground) economy.

In fact, the region's informal economy is very significant, such that the official statistics do not adequately reflect the reality of the regional labour market.

1.1.3/ Economic structure

In 2012 Loreto's Gross Value Added (GVA) totalled 4,024,546 nuevos soles, representing 1.9% of the national total. In economic terms this percentage is low relative to the size of the population: 3.4% of the country. The following table shows the structure of Loreto's GVA for 2012 by sector of activity:

<table>
<thead>
<tr>
<th>Activities</th>
<th>GVA</th>
<th>Structure %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, hunting and forestry</td>
<td>541,713</td>
<td>13.5</td>
</tr>
<tr>
<td>Fishing</td>
<td>15,757</td>
<td>0.4</td>
</tr>
<tr>
<td>Mining</td>
<td>146,497</td>
<td>3.6</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>495,861</td>
<td>12.3</td>
</tr>
<tr>
<td>Electricity and water</td>
<td>89,478</td>
<td>2.2</td>
</tr>
<tr>
<td>Construction</td>
<td>321,137</td>
<td>8.0</td>
</tr>
<tr>
<td>Trade</td>
<td>706,992</td>
<td>17.6</td>
</tr>
<tr>
<td>Transport</td>
<td>339,673</td>
<td>8.4</td>
</tr>
<tr>
<td>Restaurant and hotels</td>
<td>259,141</td>
<td>6.4</td>
</tr>
<tr>
<td>Public services</td>
<td>472,783</td>
<td>11.7</td>
</tr>
<tr>
<td>Other services</td>
<td>635,514</td>
<td>15.8</td>
</tr>
</tbody>
</table>

| Gross Value Added | 4,024,546 | 100 |

Source: Central Reserve Bank of Peru.
* Values at constant prices 1994

4 Last year available with information
The **main economic sectors** in the region, in relation to their GVA figures, are "Trade", "Other Services", "Agriculture, Hunting and Forestry" and "Manufacturing". Fishing, meanwhile, is a relatively minor activity in terms of the area's economic structure.

By product, for contribution to the GVA, the following are of note:

<table>
<thead>
<tr>
<th><strong>Agriculture</strong></th>
<th><strong>Yucca</strong>: In 2012 the region of Loreto was the leading producer in the country, with 29.7% of the national total, and 333 thousand tonnes.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Banana</strong>: 267 thousand tonnes of bananas were produced in 2012, representing 13.6% of the national total, placing the region in fourth place.</td>
<td></td>
</tr>
<tr>
<td><strong>Rice</strong>: Production in 2012 came to 124 thousand tonnes. Nationally, this amounted to 4.1% of total production.</td>
<td></td>
</tr>
<tr>
<td><strong>Hard yellow corn</strong>: Maize production totalled 79 thousand tonnes, representing 5.7% of the nation's production.</td>
<td></td>
</tr>
<tr>
<td><strong>Fishing</strong></td>
<td>Despite the importance of <strong>fish fauna</strong> in the Amazon basin, this activity makes a very limited contribution to the region's economy, in 2012 representing only 0.4% of GVA. There is also some activity involving <strong>ornamental fish</strong>, exported to countries like the USA, Germany, France, Japan and Taiwan.</td>
</tr>
<tr>
<td><strong>Mining</strong></td>
<td>The contribution of this activity to the regional GVA is 3.6%, especially the exploitation of <strong>oil</strong>.</td>
</tr>
<tr>
<td><strong>Manufacturing</strong></td>
<td>Sawn timber, plywood, beverages (malts and soft drinks), motorcycle and mototaxi assembly, canned hearts of palm and oil by-products are the main items produced by this activity, representing 12.3% of the regional GVA.</td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td>The contribution of this activity accounts for 8.4%, and is made up of the hydrographic transport network, a small land-based system, and air transport. River transport is the most widely used system in the region, as rivers are navigable, better connected, and it is the most economic option. Ground transportation is significantly underdeveloped, with a lack of interprovincial highways. This type of transport is limited to the capital of Iquitos and its nearby localities. Port infrastructure includes facilities at Iquitos and Yurimaguas, the alternate port of Masusa and other private ones. Concerning telecommunications, there are 57,207 fixed telephone lines and 317,213 mobile telephony ones, with a density of 5.5 / 42.2 lines per 100 inhabitants, respectively.</td>
</tr>
<tr>
<td><strong>Financial services</strong></td>
<td>The Loreto region has seen a trend towards financial deepening. Loreto's credit ratio/GVA stood at 17.7% in 2012. In addition, its number of financial institutions grew 2.9 times from 2003 to 2013.</td>
</tr>
</tbody>
</table>

*Source: Central Reserve Bank of Peru.*

In relation to **exports**, the region of Loreto mainly exports forest products (lumber, plywood, paper), which in 2012 represented 60.6% of the total. This reality raises a number of issues to address with regards to environmental pressure and the need to undertake other, more sustainable activities. The export of oil and its by-products accounted for a significant percentage of the region's exports in 2012. However, although nationally the Loreto region ranks high in the production of corn, banana and yuca, this production is aimed at domestic consumption, as agricultural exports stand at just slightly above 4% of the total.
### Structure of exports, by type of product 2012

<table>
<thead>
<tr>
<th>Type</th>
<th>Structure % 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export of traditional products (Crude oil and by-products) (*)</td>
<td>13.4</td>
</tr>
<tr>
<td>Export of traditional products</td>
<td>75.3</td>
</tr>
<tr>
<td>Agriculture and livestock</td>
<td>4.2</td>
</tr>
<tr>
<td>Fishing</td>
<td>6.6</td>
</tr>
<tr>
<td>Wood and paper</td>
<td>60.6</td>
</tr>
<tr>
<td>Other non-traditional products</td>
<td>3.9</td>
</tr>
<tr>
<td>Other exports1</td>
<td>11.4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Central Reserve Bank of Peru.

(*) Includes the repair of capital goods, oil equipment and systems, and spare parts for helicopters.

---

### 1.2/ Socioeconomic Diagnosis of the Region of San Martín

#### 1.2.1/ Social Aspects

The Department of San Martín is located in the northeastern part of Peru, in the high jungle, and borders on the departments of Loreto, Amazonas, Huánuco, and La Libertad. San Martín covers an area of 51,253 km².

The population of the region comes to some 830,000 people⁵, which represents about 3% of the total population of Peru.

With regards to the educational level in San Martín, there is currently a high rate of school attendance of children at the primary and secondary levels. However, less than 40% of the general population has primary and secondary education and far fewer possess higher education. In light of this data, and in line with the impressions received during interviews in the region, certain limitations arise when considering future growth based on knowledge and innovation, as the education and training of human resources is an important factor for knowledge-based economies.

In 2012 the region of San Martín ranked 13th on Peru's Human Development Index chart, a significant improvement over 2003, when it ranked 19th.

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⁵ INEI estimates for 2014
1.2.2/ Labour Market

Just as in the region of Loreto, San Martín's labour market is characterised by a significant informal economy, such that the official data does not always reflect reality. According to the INEI, in 2012 9,500 people (just over 1% of the population) were unemployed.

Agriculture, fishing and mining are the industries with the highest number of employees: 186,479 people (45% of the total employed population). Manufacturing, meanwhile, employed just 1.1% of the population.6

1.2.3/ Economic Structure

In 2012 the Gross Value Added in the region of San Martín stood at 2,756,097 (thousands of 1994 nuevos soles), placing the economic weight of the region of San Martín at 1.288 of Peru's total, well below its population weight (3%).

The main economic sectors in the region, according to their contribution to the GVA, as shown in the following table, are Agriculture, Hunting and Forestry (27.3%); Services (26.3%, including government services); Trade (12.7%) and Manufacturing (13.3%).

<table>
<thead>
<tr>
<th>Activities</th>
<th>GVA</th>
<th>Structure %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, hunting and forestry</td>
<td>752,227</td>
<td>27.3</td>
</tr>
<tr>
<td>Fishing</td>
<td>1,282</td>
<td>0</td>
</tr>
<tr>
<td>Mining</td>
<td>78</td>
<td>0</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>366,715</td>
<td>13.3</td>
</tr>
<tr>
<td>Electricity and water</td>
<td>16,231</td>
<td>0.6</td>
</tr>
<tr>
<td>Construction</td>
<td>238,221</td>
<td>8.6</td>
</tr>
<tr>
<td>Trade</td>
<td>350,823</td>
<td>12.7</td>
</tr>
<tr>
<td>Transport</td>
<td>165,487</td>
<td>6</td>
</tr>
<tr>
<td>Restaurants and hotels</td>
<td>138,478</td>
<td>5</td>
</tr>
<tr>
<td>Public services</td>
<td>320,232</td>
<td>11.6</td>
</tr>
<tr>
<td>Other services</td>
<td>406,323</td>
<td>14.7</td>
</tr>
<tr>
<td><strong>Gross Value Added</strong></td>
<td>2,756,097</td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Central Reserve Bank of Peru.
* Values at constant prices 1994

6 INEI data from 2010 (agriculture, fishing and mining) and from 2012 for manufacturing.
7 Information obtained from the Central Reserve Bank of Peru report, with data from the INEI (National Bureau of National Accounts) for 2012, at constant prices.
8 Compiled internally based on INEI data
The following table presents the structure of the productive activity in relation to its contribution to GVA.

<table>
<thead>
<tr>
<th>Agriculture, hunting and forestry</th>
<th><strong>Rice</strong></th>
<th>San Martín was the second largest rice producer in 2012, with an output of 558 thousand tonnes, representing 18.6% of the national total.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coffee</strong></td>
<td>The region came in third place with regards to production, at 17.8% of national output and 54,000 tonnes.</td>
<td></td>
</tr>
<tr>
<td><strong>Bananas</strong></td>
<td>San Martín is the leading region in Peru with reference to banana production, with 17.2% of the country’s total.</td>
<td></td>
</tr>
<tr>
<td><strong>Hard yellow corn</strong></td>
<td>As regards this product, in 2012 the region stood at fourth place nationally, with 9% of production and turning out 126,000 tonnes.</td>
<td></td>
</tr>
<tr>
<td>Fishing</td>
<td>Fishing has a minor impact on the regional GVA and does not make a major contribution to formal employment in the region, especially compared to other regions, such as Loreto. However, it is an important sector when it comes to informal employment and production for self-consumption.</td>
<td></td>
</tr>
<tr>
<td>With reference to aquaculture it also stands out amongst Peru’s Amazonian regions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>Manufacturing accounts for 13.3% of the GVA, which makes it the third most important sector in the region. Among the main products within this sector are palm oil and butter, palm soap, canned palm hearts, chocolates, cheeses, soft drinks, cigars for export, cement, lumber, sawn timber, sacha inchi oil, rice and yellow corn.</td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td>This is the fourth largest sector in the region of San Martín, responsible for 12.7% of GVA.</td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>This sector’s contribution to the regional GVA is 6%. The main means of transport in the region are by land and air. In 2012 San Martín had a road network of 4,619 kilometres, of which only 17% were paved. In relation to air transport, Tarapoto Airport is the main facility, although there are airports in other provinces of the region: Rioja, Moyobamba, Juanjui and Tocache. With reference to telecommunications, in 2012 the region had nearly 30,000 landlines in service, and 435,300 mobile lines.</td>
<td></td>
</tr>
<tr>
<td>Financial Services</td>
<td>This has been an important sector for the region, which recorded a financial deepening of 32.7% in 2012. Also, the number of financial offices increased 3.1 times in the 2003-2013 period.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Central Reserve Bank of Peru. Description of the Department of San Martin.

In relation to exports, traditional export products are most important to the economy of San Martín, particularly coffee exports, which in 2012 accounted for 76.6% of the total. The export of agricultural products is also important to the region, representing 19.3% of the total, while fishing and wood account for a much smaller percentage.

Despite being small in terms of exports, as it is mainly used for domestic consumption, fishing boasts great potential. In fact, there is a small number of initiatives in the aquaculture sector based on a recognition of the latent opportunity for export and its exploitation in the short term.
2/ THE STATE OF AMAZONAS (BRAZIL)

21/ Socioeconomic Diagnosis

2.1.1/ Social Aspects

The State of Amazonas is located in northwestern Brazil, bordering on Venezuela and Colombia, the regions of Loreto and Ucayali in Peru, and the Brazilian states of Roraima, Pará, Mato Grosso, Rondonia and Acre.

Amazonas is the state with the largest surface area in Brazil: 1,559,159.1 km². However, it features a very low population density (2.23 inhabitants / km²). Its estimated population in 2013 was 3,807,921. Manaus is the state capital, with a population of nearly 2,000,0009 and standing as the economic and cultural centre of northern Brazil.

The population structure of the State of Amazonas is characterised by a pyramid dominated by a predominantly young population (29 and under).

As for education, the data provided by the IBGE (Brazilian Institute of Geography and Statistics) on the characteristics of education in the State of Amazonas indicate that a high percentage of the population age 17 and under does not attend any kind of educational facility (30.74%).

Regarding transport infrastructure, Manaus is a major port for deep draft vessels, although overland transport development is limited and of poor quality. In fact, the problem of transport logistics one of the main hurdles to the area's economic and territorial development, particularly with regards to advancing aquaculture, as proposed. This is not, in this regard, an isolated problem, but one shared by the three regions.

9 The data are estimates for 2013 issued by the Brazilian Institute of Geography and Statistics (IBGE).
10 The data provided by the IBGE correspond to the 2006 national survey of households (latest data available).
With a population of nearly two million people, the capital of the State of Amazonas, Manaus, accounts for two-thirds of the State’s population and features most of its economic activity, where manufacturing is the most important sector. The situation is quite different from that in the three municipalities in the border area with Peru, where aquaculture\(^{11}\) is an activity with potential (Atalaia do Norte, Benjamin Constant and Tabatinga). In these three municipalities the main socio-economic indicators are as follows:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Atalaia</th>
<th>Benjamin Constant</th>
<th>Tabatinga</th>
</tr>
</thead>
<tbody>
<tr>
<td>Territory (km(^2))</td>
<td>76,351,667</td>
<td>8,793,417</td>
<td>3,224,875</td>
</tr>
<tr>
<td>Estimated population 2013</td>
<td>17,174</td>
<td>37,564</td>
<td>58,314</td>
</tr>
<tr>
<td>Population density (inhab./km(^2))</td>
<td>0.20</td>
<td>3.80</td>
<td>16.21</td>
</tr>
<tr>
<td>Basic Education enrolment (2012)</td>
<td>3,731</td>
<td>8,692</td>
<td>13,174</td>
</tr>
<tr>
<td>No. of companies (2011)</td>
<td>25 units</td>
<td>154 units</td>
<td>258 units</td>
</tr>
<tr>
<td>Salaried employees (2011)</td>
<td>775 people</td>
<td>1,702 people</td>
<td>2,334 people</td>
</tr>
<tr>
<td>Total employees (2011)</td>
<td>791 people</td>
<td>1,839 people</td>
<td>2,613 people</td>
</tr>
<tr>
<td>MHD1 (2010)</td>
<td>450</td>
<td>0.574</td>
<td>0.616</td>
</tr>
<tr>
<td>2011 GDP (current prices)</td>
<td>1.37 million reales</td>
<td>1.76 million reales</td>
<td>2.63 million reales</td>
</tr>
<tr>
<td>2011 per capita GDP</td>
<td>4,784.63 reales</td>
<td>5,142.22 reales</td>
<td>4,935.53 reales</td>
</tr>
<tr>
<td>2011 Agricultural GVA</td>
<td>9.58 million reales</td>
<td>3.33 million reales</td>
<td>1.96 million reales</td>
</tr>
<tr>
<td>2011 Industrial GVA</td>
<td>7.64 million reales</td>
<td>1.84 million reales</td>
<td>3.25 million reales</td>
</tr>
<tr>
<td>2011 Services GVA</td>
<td>5.57 million reales</td>
<td>1.20 million reales</td>
<td>1.99 million reales</td>
</tr>
</tbody>
</table>

Source: Brazilian Institute of Geography and Statistics - IBGE

2.1.2/ Labour Market

The percentage of those age 16 or older formally employed in jobs is 41.6%, while the effect of the underground economy means that labour market indicators are imprecise. Meanwhile, the unemployment rate was gauged at 8%. By age group, young people ages 16 to 24 had the biggest problem finding work, with an unemployment rate of 16.2%. Those 50 or older had the lowest unemployment rate: 2.3%.\(^{12}\)

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\(^{11}\) As noted below, aquaculture is an activity of growing interest in the two Peruvian regions and in the Brazilian municipalities in the border area being analysed in this study. In addition, focusing actions on a particular activity can help to boost cross-border cooperation within the framework of the project.

\(^{12}\) IBGE data for 2013
2.1.3/ Economic Structure

The **regional economic activity** in the State of Amazonas is quite different from that in the Peruvian regions, largely due to its status as a free trade zone.

By **activity sector**, "processing industries" were those with the highest percentage of employed people, at (20.6%); public administration, defence and social security employed 19% of workers; followed by trade, motor vehicle and motorcycle repair, with 16.7% of the total.

In the case of processing industries, although this is the activity with the highest percentage of workers, they are concentrated in just 6.79% of the business units, 48% of which are dedicated to "trade and motor vehicle/motorcycle repair."

Importantly, in recent years a system of federal investments and tax incentives have turned the region into a major industrial centre, attracting electronics and mobile phone companies (Nokia, Sagem, Gradiente, Siemens, Sony, LG and BenQ) and motorcycle manufacturers (Honda, Harley Davidson and Jialing).

**The Manaus Free Trade Zone**

| In 1957 Law No. 3173 established the Manaus Free Trade Zone. The future prospects for this free trade zone are based on synergies between the consolidation of the Manaus Industrial Hub and the attraction of investment for the economic exploitation of regional potential (economic tourism, agribusiness, bio-industry, gas and oil) |

Source: Manaus Free Trade Zone Development Model
Number of units, total number of salaried employees, by sector of activity (2011)

<table>
<thead>
<tr>
<th>Sector of activity</th>
<th>Units</th>
<th>Total no. of employees</th>
<th>Salaried employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative activities and complementary services</td>
<td>2,067</td>
<td>54,320</td>
<td>51,782</td>
</tr>
<tr>
<td>Financial, insurance and related services</td>
<td>485</td>
<td>5,567</td>
<td>5,231</td>
</tr>
<tr>
<td>Real estate activities</td>
<td>145</td>
<td>875</td>
<td>622</td>
</tr>
<tr>
<td>Professional, scientific and technical activities</td>
<td>1,394</td>
<td>8,390</td>
<td>6,391</td>
</tr>
<tr>
<td>Public administration, defence, and social security</td>
<td>311</td>
<td>120,983</td>
<td>120,980</td>
</tr>
<tr>
<td>Agriculture, livestock, forestry, fishing and aquaculture</td>
<td>201</td>
<td>1,303</td>
<td>1,059</td>
</tr>
<tr>
<td>Water, sewerage, waste management and decontamination activities</td>
<td>113</td>
<td>4,118</td>
<td>4,010</td>
</tr>
<tr>
<td>Housing and food</td>
<td>1,761</td>
<td>19,596</td>
<td>17,558</td>
</tr>
<tr>
<td>Arts, culture, sports and recreation</td>
<td>320</td>
<td>1,465</td>
<td>1,159</td>
</tr>
<tr>
<td>Trade, motor vehicle/motorcycle repair</td>
<td>17,636</td>
<td>105,481</td>
<td>85,819</td>
</tr>
<tr>
<td>Construction</td>
<td>1,793</td>
<td>36,008</td>
<td>33,565</td>
</tr>
<tr>
<td>Education</td>
<td>826</td>
<td>57,434</td>
<td>56,658</td>
</tr>
<tr>
<td>Electricity and gas</td>
<td>109</td>
<td>2,722</td>
<td>2,703</td>
</tr>
<tr>
<td>Processing industries</td>
<td>2,488</td>
<td>130,094</td>
<td>126,916</td>
</tr>
<tr>
<td>Mining</td>
<td>72</td>
<td>3,546</td>
<td>3,474</td>
</tr>
<tr>
<td>Information and communications</td>
<td>518</td>
<td>6,209</td>
<td>5,572</td>
</tr>
<tr>
<td>Other service activities</td>
<td>3,661</td>
<td>15,394</td>
<td>11,723</td>
</tr>
<tr>
<td>Health and social services</td>
<td>929</td>
<td>23,115</td>
<td>21,570</td>
</tr>
<tr>
<td>Transport, storage and postal services</td>
<td>1,770</td>
<td>35,075</td>
<td>33,031</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>36,599</strong></td>
<td><strong>631,695</strong></td>
<td><strong>589,823</strong></td>
</tr>
</tbody>
</table>

Source: IBGE - Statistics from the National Registry of Companies (2011)

With respect to exports, of note are rubber, Brazil nuts, and timber. In the case of timber exports, there have been conflicts with indigenous populations due to the deforestation of the Amazon. This is an element that can be considered an incentive to facilitate the furthering of other emerging activities, such as aquaculture, in addition to optional activities for the area's sustainable development.
3/ R&D STRUCTURE

3.1/ R&D structure of the regions of Loreto and San Martín (Peru)

The R&D in the regions of Loreto and San Martín is not developed or cohesive enough. There are institutions, such as universities and research centres, but there is no coordination of a Regional Innovation System. When existing, it is an informal and sporadic manner, and in no case facilitated by a regulatory or formal framework. Based on the interviews of agents in the two regions, it can be deduced that there is little connection between the various R&D institutions located in the regions of Loreto and San Martín, and with the business community.13

Compared to the Peruvian regions, the R&D system in the State of Amazonas is relatively well established, although there is still significant room for improvement, as is clear from the interviews. In particular, the relationships between agents must be strengthened. At the national level there is also a significant R&D support structure, which is also reflected in the State of Amazonas.

Example 2: Revitalisation and territorial development of the Drava-Danube river ecosystem area (HU-HR)

The authorities of the Duna-Drava National Park (Hungary) and the water management authority in Croatia carried out this project from 2007 to 2013 to protect the natural habitats by the Vuka and Drava rivers in order to restore the original hydrographic situation and create a space suitable for protected and rare aquatic species in the region. The restoration of these unique areas, devastated by previous interventions, yielded a new hydric ecosystem and a more sustainable natural space, and one more valuable to improving production and attracting ecotourism to the region.

Source: KEEP Database

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13 The institutions existing in the three regions are described below.
4/ COMMON DIAGNOSIS

The Amazon River joins the regions of Loreto, in Peru, and the Brazilian municipalities of Atalaia, Benjamin Constant and Tabatinga, while the region of San Martin is crossed by the Huallaga River. Both basins (Amazon and Huallaga) are the basis for the development of aquaculture, a sector to be promoted in order to nurture cross-border cooperation, due to its high growth potential and capacity to generate sustainable development.

Aquaculture

In interviews carried out in the region by European experts, a number of areas for collaboration (shipbuilding, agriculture, timber, tourism, logistics) were identified. But the need was also detected to focus efforts on a specific area in order to further the CBC, prioritizing resources in the short and medium term. In this regard, the aquaculture/fishing industry was considered to have great potential and to constitute one upon which more profound CBC could be implemented, aimed at contributing to the regional development of the three regions.

There are several factors pointing to the opportunity to build on aquaculture as a force driving territorial development, namely:

- Mechanisms to help limit activities that put pressure on the environment, such as crops (soil degradation), forestry (deforestation), etc.
- The regions' strategic reflections on the sector suggest that it will be able to facilitate the undertaking of cross-border cooperation through this activity.
- There are experiences in some regions (e.g. in San Martín) of collective reflections at thematic round tables (on aquaculture) that could also facilitate actions along this line.
- Aquaculture's interrelation and productive compatibility with other activities that could form part of an extended value chain (agriculture, forestry, tourism, agro-processing, logistics, etc.).
- There seems to be mutual interest in the field of aquaculture and related activities that would facilitate a shared willingness to cooperate and commitment to cross-border collaboration between the participating regions.
- Aquaculture and fisheries, in general, are a good example of activities to be carried out through cross-border cooperation, as the material (fish) shares cycles encompassing different areas and related to different spaces.
Through the interviews a number of aspects have already identified that characterize aquaculture in the Peru-Brazil area, which could be summarized as follows:

- There is a clear challenge when it comes to entering (and covering) large foreign markets with much more sophisticated and demanding consumers.
- A destructuring of the value chain shared by the three regions, between producers of seeds, and of food, and those engaged in breeding and fattening, processing (practically non-existent) and distribution and marketing.
- There is potential for the incorporation of technology that would allow for a significant increase in productivity. By areas, in Peru traditional technology is already exploited, but there is room to introduce and adapt more modern technology that is used in Brazil through, for example, cross-border collaboration formulas for innovation and R&D.

Source: field interviews with local stakeholders.

These territories share a number of similarities at the socioeconomic level, such as low population density, the people's remoteness and isolation from decision-making centres, the limited qualifications of the human resources available, the high percentage of indigenous persons, the informality of economy, and the limited presence and development of any R&D.

The low schooling rate is a major handicap for the area's socioeconomic development in the medium and long term, as at the educational level is a highly relevant factor when it comes to promoting actions targeting growth based on innovation and knowledge. In this regard the regions share the need to increase the qualifications of their social capital linked to the aquaculture sector. This is an aspect to carefully consider given the importance of the introduction of and adaptation to technology to enable the sector to make a qualitative leap forward, and turn it into an element driving the economy.14

Also, employment indicators show that the labour market in the three regions analysed is characterized by a high rate of informality, and that it is one based on low-skill employment, mainly in the primary sector (agriculture and livestock), which is the main one linking the project's border areas. The informality of a large part of the economic activity has important implications, generating significant market failures: a lack of information, uncertainty, the difficulty of forming associations, enhancing social capital, the restructuring of the value chain, a lack of a shared vision and critical mass, etc.

Finally, amongst the major problems found in the three regions, of special importance is the lack of a business culture; poor infrastructure with regards to transport and travel (especially poorly-paved roads) and telecommunications (no fibre optics); and the inefficient energy system, which is also a key resource that impacts the costs and productive capacities of the remaining economic activities. Also worthy of note is the lack of a support or an R&D system consolidated and aimed at the needs (technology and training) of the business community, and the limited technological development, which would make it possible to meet the challenges in other areas, such as transport, logistics and energy.

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14 This analysis is the result of interviews carried out in the field with various entities and people involved in the sector, from the private, public and academic spheres.
5/ THE AQUACULTURE SECTOR IN CROSS-BORDER REGIONS

The degree of informality is higher in these regions than in Europe, but some degree of informality is something that transcends every border in the world. It also turns out to be a sector with great prospects for development in the area, especially for cross-border cooperation. Besides being an **incipient activity in the territory**, it is also an activity of great importance for the **alleviation of poverty** (as 90% of world production is by developing countries and small family farms) through **direct job creation**. It also increases the number of jobs in ancillary activities, such as elaboration, packaging, marketing and distribution, and it generates more **foreign revenue** and **food security**. This activity, in addition, may have an important repercussions on the development of certain resources (according to the possibilities of each region) linked to the territory, food, health, etc. According to FAO (UN) data, aquaculture production has been increasing in recent years, going from 47.3 million tonnes in 2006 to 63.6 million in 2011, as can be seen in the following table, which shows the international aquaculture production trend.

**International aquaculture production trend (millions of tonnes)**

<table>
<thead>
<tr>
<th>Production</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continental</td>
<td>31.3</td>
<td>33</td>
<td>36</td>
<td>38.1</td>
<td>41.7</td>
<td>44.3</td>
</tr>
<tr>
<td>Maritime</td>
<td>16</td>
<td>16.6</td>
<td>16.9</td>
<td>17.6</td>
<td>18.1</td>
<td>19.3</td>
</tr>
<tr>
<td><strong>Total aquaculture</strong></td>
<td><strong>47.3</strong></td>
<td><strong>49.9</strong></td>
<td><strong>52.9</strong></td>
<td><strong>55.7</strong></td>
<td><strong>59.9</strong></td>
<td><strong>63.6</strong></td>
</tr>
</tbody>
</table>

Source: FAO 2012

With regard to South America, aquaculture has grown in recent years, including in Brazil and Peru, according to the FAO report.

**Major aquaculture producers in the Americas 2010**

<table>
<thead>
<tr>
<th>Country</th>
<th>Tonnes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile</td>
<td>701,062</td>
<td>27.1%</td>
</tr>
<tr>
<td>United States</td>
<td>495,499</td>
<td>19.23%</td>
</tr>
<tr>
<td><strong>Brazil</strong></td>
<td><strong>479,399</strong></td>
<td><strong>18.61%</strong></td>
</tr>
<tr>
<td>Ecuador</td>
<td>271,919</td>
<td>10.55%</td>
</tr>
<tr>
<td>Canada</td>
<td>160,924</td>
<td>6.25%</td>
</tr>
<tr>
<td>Mexico</td>
<td>126,240</td>
<td>4.90%</td>
</tr>
<tr>
<td><strong>Peru</strong></td>
<td><strong>89,021</strong></td>
<td><strong>3.46%</strong></td>
</tr>
<tr>
<td>Colombia</td>
<td>80,367</td>
<td>3.12%</td>
</tr>
<tr>
<td>Cuba</td>
<td>31,422</td>
<td>1.22%</td>
</tr>
<tr>
<td>Honduras</td>
<td>27,509</td>
<td>1.07%</td>
</tr>
<tr>
<td>Others</td>
<td>113,067</td>
<td>4.39%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,576,428</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>


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15 However, according to FAO data on employment growth in the sector from 2000-2010, it came in at 2.6%, hardly a significant figure.


17 FAO, 2012 (op. cit.) stated that "in North America aquaculture has been growing in recent years, but in South America it has featured strong and continuous growth, particularly in Brazil and Peru".
The countries of South America, especially Brazil and Peru, have made significant strides to become farmed fish producers, with Brazil positioning itself as the third largest in the Americas. In any case, the data from Brazil and Peru (and their relative positions) should be seen in relative terms, and accounting for their size compared to other countries in the Americas.

Aquaculture represents a field for the development of R&D, an aspect of great relevance to the selected territories, as only incipient progress has been made in this regard to date in it. In Europe progress in R&D has led to significant improvements in the efficiency of production systems and the quality of products, at the same time mitigating environmental impact, which is one of the main problems arising from aquaculture farms.

Examples of R&D Applied to Aquaculture

- Underwater surveillance to manage feeding and biomass (particularly waste)
- Improving recirculation systems
- Creating cages and nets for places with more energy and new designs for cages (wider, submersible, sturdier, etc.)
- Development of Integrated Multitrophic Aquaculture (IMTA) production systems
- New technologies to reduce water consumption
- Continuous flow systems for the exploitation of thermal energy.
- The use of farmed species in other sectors, such as pharmaceuticals
- Genetic development to improve species, growth, conversion factors.

Example 3: Renaturation of the Lake Constance Fish Population (AT-DE-CH-LI)

The Institute for Lake Research, Langenargen (Germany) carried out this project from 2000 to 2006 in order to renature the lake for the proper settlement of the fish species and to ensure their quality. The sediment studies helped to identify the growth and size potential of the fish there, prospectively for 3-5 years, despite the heterogeneous substrate. The transfer of the experience and knowledge gained to other inland waters, within the Action Programme for coastal and shallow waters backed by the International Commission for the Protection of Lake Constance, made it possible for the results of this project to be taken advantage of, adding value to other lake protection measures at other levels.

Example 4: Identification, preservation and rehabilitation of the native trout populations in the Aosta Valley and the Haute-Savoie (IT-FR)

The Regional Consortium for the practice of fishing (IT) and the Haute-Savoie Federation for Fisheries and Protection of the Aquatic Environment (FR) undertook this project from 2000 to 2006 to carry out more in-depth studies and research on native trout populations, for their identification, preservation and rehabilitation. Biological, ecological and genetic research was carried out on these populations, along with measures to disseminate the results and training activities.
5.1/ Aquaculture in the Peru/Brazil border area

As already mentioned, aquaculture is an economic activity with great developmental potential in the three regions selected for this project, and is also being promoted by their regional governments.

In fact, in Peru the “National Aquaculture Development Plan 2010-2021” establishes that each region is to formulate its own Regional Aquaculture Plan to promote the sector’s development and to contribute to the meeting of national aquaculture development objectives. The goal of this national plan is “To promote the generation of the relevant human, material, technological, and financial resources, as well as the adequate technical services and institutional conditions to facilitate investment in aquaculture production and the commercialization of aquaculture products on the international market.”

In the region of San Martin (Peru) the document “Strategic Framework for Aquaculture in the Region of San Martin” prepared by the Regional Government in 2013, presents the region, indicating important conditions for the development of aquaculture in tropical waters, though its potential is not properly exploited. Therefore, a strategy has been

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Example 5: Lake Constance Trout: Measures for Identification and Spawning Security (DE-AT-CH-LI)

The governments of Bavaria (DE), Liechtenstein, Austria and Switzerland carried out this project from 2007 to 2013 in order to protect and increase production from Lake Constance, especially with regards to trout. We studied the population in the tributaries and spawning grounds, logging and mapping them. We also reviewed the associated vegetation and its influence on spawning and survival rates, in order to develop an independent reproduction system allowing for the sustainable exploitation of this resource, in addition to respectful use of the environment.

Source: KEEP Database

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Example 6: Enningdalsälven (NW-SE)

The authorities in Västra Götland (Sweden), the Norwegian Institute for Nature Research (NINA) and the Museum of Natural History and Archaeology in Trondheim (NO) carried out this project from 2007 to 2013 on the lakes and rivers of the Enningdalsälven basin, which is of great biological and recreational value. Acid rain has done great harm to the area, causing some species of fish to disappear. To counteract the effects of acidification, studies were conducted on both sides of the border, observing that current flows were altered to facilitate white-water rafting, as well as the activities of mills and hydroelectric stations, preventing the migration of fish. The project developed a joint plan for hydric resources and fishery conservation, bringing together multiple classification systems, as there is no coordination between fishing in Norway and Sweden.

Source: KEEP Database
designed to provide guidance and support to develop the sector in the region in a sustainable manner. Likewise, the "Joint Departmental Development Plan 2015-2021 " sets out three priorities related to aquaculture:

1. **Social Hub**: Food security
2. **Economic Hub** Aquaculture (Paiche, Gamitana, Tilapia, Pacu, Black prochilidus and Shrimp)
3. **Environmental axis**: Sustainability of resources

In San Martin, in addition, the ICI international cooperation project19 is helping to develop the sector through research with fry, organizational enhancement, capacity building, and risk management plans for aquaculture species.

Among the Regional Government's proposals to boost aquaculture is promoting the production of native species (carachama, acarahué, black prochilidus, etc.) fry, the development of local aquaculture technology with the native species (fish farming, floating cages, diets, etc.), the aquaculture program in conservation areas and native communities, and a restocking programme with native species in aquatic environments.

In the region of **Loreto**, aquaculture was begun with a with a view to food security and improving the lives of those who informally engaged in this activity. Over time aquaculture has taken on greater importance in the region20 and now benefits from support in the form of research, technology transfer, extension and promotion activities by various governmental and non-governmental entities, such as the IIAP, FONDEPES, FONCODES, GOREL, AECID, TERRA NUOVA, SIUC, CARITAS and the CESVI.21

There are also experiences bridging Peru and Colombia involving joint activities aimed at promoting aquaculture in border regions and, in particular, the rivers along the borders between the two countries, such as the project defined in 2012 by two different entities in both countries of the elaboration of the "Binational Plan for the Organisation and Development of Fisheries and Aquaculture in the Area Shared by Peru and Colombia on the Putumayo River," or the regional project carried out in 2004 within the FAO's support framework: "The Organisation of Fishery Management on the Putumayo River."

Brazil, meanwhile, ranks second in South America in aquaculture production, and in recent years the Government has focused on strengthening the institutional support provided the fishing and aquaculture sector. Government policies centre on the criteria of sustainability, social inclusion, an adequate production chain structure, bolstering the internal market, a territorial approach to management, development programmes, and increasing competitiveness.22

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19 ICI Project - Capacity building for the development of aquaculture with *Arapaima gigas* and other species in the region of San Martin, Peru.
20 The annual report (2013) from the Region of Loreto aquaculture study states that aquaculture in Iquito is currently worth from 5 to 8 million nuevos soles in the sale of fry, fish meat and balanced fish feed.
In the northern region of Brazil (State of Amazonas) aquaculture is still a nascent activity, and focuses on the cultivation of freshwater fish. However, it boasts major potential for development, given the characteristics of the region, with abundant water resources, a favourable climate and a diversity of species that can be cultivated. However, these natural characteristics of the area and government support for this economic activity may not be sufficient for aquaculture to take off in the territories along the Brazilian Amazon border with Peru because of its remoteness from the capital and its regional isolation. Added to this is the problem of the acquisition of fry, and the lack of information and personnel technically qualified in the field of aquaculture.

A very promising initiative that is taking place in the border regions with Peru is "Rota do Pescado do Alto Solimões". This initiative is supported and funded by the Ministry of National Integration, and its main objective is "to promote regional development and socio-economic inclusion through a productive structure and the economic integration of the country’s least-developed regions into national and international markets for production, consumption and investment." The efforts undertaken along the route share a set of technologies, ranging from raw materials, to production and processing technologies, through to the commercialisation stage. This project focuses on two main Hubs, one of which is formed by the towns of Tabatinga, Benjamin Constant and Atalaia do Norte, in line with the work involved in the Brazil-Peru cross-border project.

In the State of Acre there is also a noteworthy aquaculture effort. This is the "Fish Farming Development Programme for the State of Acre," backed by the government there. While this is not, in theory, a territory selected within the framework of the project, it is a border region with Peru and also served as an example and a showcase of good practices for the work done as part on the Brazil-Peru cross-border cooperation project. This programme aims to modify the State's primary production economic structure. The State of Acre's goal is to become the leading aquacultural region, defined by high production, limited environmental impact, and quality.

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24 The distance between the sites of production and consumption is seen as a handicap for the development of aquaculture (Wurts 2000).
25 Resumo sobre a Rota do Pescado no Alto Solimões – AM, Document sent by the Ministry of National Integration's Secretary of Regional Development.
26 Governo do Estado do Acre, Programa de Desenvolvimento da Piscicultura no Estado do Acre.
6/ FRAMEWORK OF THE CUSTER'S STRATEGIC PLAN

6.1/ Map of the Peru/Brazil Aquaculture Cluster

For the identification and mapping of the aquaculture activity in the project's regions, taken as a reference was the aquaculture product's value chain, differentiating the cultivation steps (precultivation-laboratory and the cultivation itself), the product's process, and its placement on the market. Also considered were the support institutions (the role of public and private R&D entities, education, training, etc.) as well as other more general supporting economic agents (for example, Chambers of Commerce, services to businesses, etc.).

Additionally, given the importance of the territorial dimension, through the consideration of (at least) three regions within this value chain, a zone-based distribution was applied, taking into account the nature of the stakeholders (private parties and entrepreneurs; public-private research and education entities; public regional and national authorities) and their location (San Martín, Loreto, Amazon border of Brazil and Colombia).

Thus, as seen on the following map, at least 4 areas appear to be key when mapping the Amazon Aquaculture Cluster, namely:

- a) The border vertex between Brazil, Peru and Colombia, with the towns of Leticia, Tabatinga and Benjamin Constant.
- b) The border between Colombia and Peru, of the Putumayo strip, with Loreto located to the north, the province of Ramón Castilla and its main municipality, Caballococha.
- c) The Region of Loreto, mainly the area of the Iquitos-Nauta highway
- d) The Region of San Martín.

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27 Although the project has focused on work in the regions of San Martin and Loreto in Peru, and the State of Amazonas in Brazil, as has been evident from the fieldwork, the Amazon aquaculture value chain is much broader, encompassing other regions, and not only in Peru, but countries like Colombia too.
The apex of the borderland trapezoid between Peru, Colombia and Brazil including the territory of Ramon Castilla (and the municipality of Caballococha) (Area A) is a strategic point for the confluence of institutions focusing on aquaculture, and due to the location of processing, transport and distribution infrastructures.

The Luzon region (zones B and C) is one of Peru’s most important aquaculture centres, mainly the Iquitos-Nauta corridor, with 806.7 Ha. A large proportion is dedication to the production of paiche (706 ponds, 295.16 hectares and 109 companies). Unevenly concentrated production, with a significant presence in Mynas, followed by the Upper Amazon. There are many producers and some initiatives to form associations, far from dynamics similar to a cluster association model. The border area in northern Loreto and southern Colombia (Zone B) is the site of the Comprehensive Putumayo River Basin Development Programme (PEDICP), with more than 350 ponds (88.25 ha), and production of 176.5 Mt, mainly of gamitana (90%).

The San Martin region (Zone D) ranks as Peru’s third largest aquaculture centre, with a total of 1,455 farms (of which 57% are informal) and a total production area that exceeds 560 Ha. Most of these production units are located in the province of San Martin. This region features a significant number of producers and some associative initiatives that could constitute an embryonic cluster.

Paiche production in Loreto is based largely on the farming of fry and, to a lesser extent, meat (this has which has been up and down, as visible in the 2010 data, with 58 tonnes, 2011: 421, 2012: 319 and 2013: 32). However, the potential is still very great. According to the diagnosis of paiche aquaculture production chain (Directorate General of Production, 2014) "if only 25% of the fish distributed by IIAP on the Iquitos-Nauta road reached adulthood, Loreto would have the capacity to produce between 100,000 and 150,000 fry each year, which would sustain a production of 1,000 to 1,500 tons of paiche alone". Given the approximate value of a kilogram of paiche on the market (20 soles), its potential as a key, driving activity is evident.
In a way similar to what we find in San Martin, Loreto's aquaculture production is unevenly concentrated, with a significant presence in Mynas, followed by the Upper Amazon. This region has a significant number of producers and some associative initiatives that, unlike other locations, seem to function - though they are still far from featuring dynamics similar to those of an association cluster. The definition process featured participation by a representative number of producers located on the Iquitos-Nauta road, along the paiche segment, also with a view to formalizing a cluster structure for the region of Loreto.

In this respect an important element to consider is the border area of in northern Loreto and southern Colombia (Zone B on the map), currently subject to the Putumayo River Basin (PEDICP) Special Comprehensive Development Programme. This initiative featured a total of 353 ponds, between 2013 and 2014, with an approximate total area of 88.25 Ha., and estimated production of 176.5 tons of fish, mainly gamitana (90%).

In terms of the vertex of the borderland trapezoid between Perú, Colombia y Brazil, including the territory of Ramón Castilla (and the town of Caballococha) (Zone A), this is a strategic point, above all due to the existence of institutions centering on aquaculture, as well as the location of transformation, transport and distribution infrastructures. Brazil has different private and public/private entities of producers (identified by the Regional Government) with the following being of note:

- Fórum de Desenvolvimento Sustentável do Alto Solimões
- Colônia de Pescadores Z-47 de Atalaia do Norte
- Colônia de Pescadores Z-24 de Tabatinga
- Sindicato de Pescadores de Tabatinga
- Associação de Piscicultores de Benjamin Constant

Example 8: Ocean Forum, Portugal – Association for the Economy of the Sea
This organization brings together different public, private and academic institutions in Portugal, dedicated to the study of the sea's potential for the territories' development, in addition to that of inland waters, in some cases.

The cornerstones of its work are
a) Entrepreneurship and business development.
b) Innovation and modernization in these sectors.
c) Internationalisation.
d) Strategic information and tracking.

For example, in aquaculture they carry out R&D activities in the following areas:
- The development of technology to manage feeding, waste and biomass, and water quality
- Offshore technology (the creation and new designs of cages and nets for places with strong waves).
- The development of new foods through the use of new raw materials.
- The use of farmed species in other sectors, such as pharmaceuticals and cosmetics.
- The development of Integrated Multitrophic Aquaculture (IMTA) production systems.
- The improvement of processing, labelling, traceability and certification.

With regards to knowledge-generating institutions, the Amazon Aquaculture Cluster Amazon features, essentially, the agents included in the following two pages, located on both sides of the Peru/Brazil border:
This is an institution for scientific research and technological development, specialising in the sustainable use of biodiversity in the Amazon region, that carries out its activities in a decentralized manner, promoting the participation of public, private and civil society institutions. The entity's main objective is to "generate and incorporate knowledge, innovative technologies and ancestral knowledge for the benefit of Amazon societies and ecosystems."

The IIAP's activities are spread throughout the geographical area of Peru's Amazon basin, in the departments of Amazonas, San Martin, Loreto, Ucayali, Huanuco, Madre de Dios, and areas of the high jungle and Amazonian lowlands in the other departments. The IIAP research system is based on six programs that contribute to sustainable management and the conservation of biodiversity:

- Amazon Biodiversity Research Program (PIBA)
- Research program for the use and conservation of water and its resources (AQUAREC)
- Research program for comprehensive forest and environmental services management (PROBOSQUES)
- Research program on climate change, territorial development and the environment (PROTERRA)
- Research program for cultural diversity and the Amazon economy (SOCIODIVERSITY)
- Research program for Amazon biodiversity information (BIOINFO)

The UNAP was created in 1961 in order to furnish the region of Loreto with a higher education institution. At first 3 advanced schools were created (chemical/industrial engineering, agronomy and mechanics and electricity), in addition to the intermediate technical institute, and training centres for workers. It also featured the Natural Resources Research Institute and an Anthropological Institute.

There are currently 14 academic departments: Agronomy (FA), Biological Sciences (FCB), Educational Sciences and Humanities (FCEH) Economics and Business (Facen), Forestry Sciences, (FCF), Law and Political Science (FDCP ), Nursing (FE), Pharmacy and Biochemistry (FFB), Food Industries (FIA), Systems Engineering and Computer Science (FISI), Chemical Engineering (FIQ), Human Medicine (FMH), Dentistry (FO), based in Iquitos; and Animal Husbandry (FZ) in Yurimaguas.

The UNSM was created in 1979 in Tarapoto, initiating its academic activities in 1982 with courses in Agronomy, Agro-industrial Engineering, Civil Engineering and Obstetrics. In 1995 the departments of Education and Humanities (based in the city of Rioja), Ecology (in Moyobamba), Systems Engineering and Computer Science, Economics and Tourism (in Lamas) were created.

The University has an R&D office (OID) that aims to "promote the development of research, training and extension." It provides support for the development of science with a view to the development of technologies that are economical, ecological and socially acceptable." The projects carried out by the OID include:

- Capacity building for the enhanced visibility of scientific-technological production at the USM-T
- Research quality system
- Undergraduate thesis competition.

The INPA, based in Manaus, was created in 1952 with the objective of generating and disseminating knowledge and technologies to train human resources for the development of the Amazon. Its work centres on coordinating various action areas:

- Biodiversity (CBIO)
- Environmental and health companies (CSAS)
- Environmental dynamics (CDAM)
- Innovation and technology (COTI)
The Amazon Federal Institute of Education, Science and Technology (IFAM) aims to promote excellence in education, science and technology for the development of the Amazon. It seeks to stand a national leader in Brazil in its respective fields. The Institute is currently comprised of ten campuses: Central Manaus, Manaus Industrial District, Manaus East, Coari, São Gabriel da Cascada, President Figueiredo, Maués, Parintins, Lábrea and Tabatinga. The Amazon Federal Institute is a member of the Federal Education Network, having administrative autonomy, and attached to the Ministry of Education, supervised by the Department of Vocational and Technological Education (SETEC).

The SINCHI is a high-level scientific and technological research institute committed to the generation of knowledge, innovation, technology transfer and the dissemination of information on the biological, social and ecological reality of the Jurisdiction, meeting the needs and expectations of the communities in the region, to which it applies committed human talent. The mission of the Amazon Institute of Scientific Research "is the realization, coordination and dissemination of high-level scientific studies research related to the biological, social and ecological realities in the Amazon region."

With regards to government and other notable institutions, the following regional (Loreto, San Martin and State of Amazonas) and national (Peru and Brazil) entities are of note:

**PERU**
- Ministry of Foreign Affairs
- Technological Production Institute (ITP)
- Directorate General of Production (San Martin)
- Directorate General of Production (Loreto)
- Caballococha Municipality (Ramón Castilla Province in Loreto)
- Special Project for the Comprehensive Development of the Putumayo River Basin (PEDICP)

**BRAZIL**
- SEPLAN - Secretaria de Estado de Planejamento e Desenvolvimento
- SDS - Secretaria de Estado do Meio Ambiente e Desenvolvimento Sustentável
- SEBRAE – Brazilian Service for Support to Micro and Small Businesses
- Instituto de Desenvolvimento Agropecuário e Florestal Sustentável do Estado do Amazonas – IDAM
- Agência de Desenvolvimento Sustentável do Estado do Amazonas – ADS
- Ministry of National Integration - MIN
- Ministério de Desenvolvimento Agrário – MDA
6.2/ SWOT Analysis

The area features a significant number of weaknesses, mainly related to human resources training and education, R&D, business capacity, governance, and social capital (business culture, joint vision, institutions and type of relationships, etc.).

The opportunities, nevertheless, are significant, having to do with natural and aquaculture's potential in terms of its capacity to contribute to territorial development, progressively introduce technology, create synergies between the three regions, through their value chain, and the bases (still incipient) for more efficient governance aligned with a strategic vision of the borderland area's territorial development.

The strengths and threats feature fewer noteworthy aspects, mainly related to the optimal nature of the territory (in the first case) and market failures and their consequences (in the second).

To a large extent, the aspects included in this analysis are also expandable to the entire economic situation encompassing the project's three regions. Thus, the SWOT of the Amazon's aquaculture cluster is a good reflection of what the SWOT analysis of San Martin, Loreto and the State of Amazonas would yield on the border of the two countries.

Below we include the SWOT breakdown for the aquaculture cluster in the Peru-Brazil cross-border area forming the object of the project.

Example 9: Ecolorimed (BE-FR-LU)

The Walloon Agricultural Research Centre (BE) and other such facilities in Belgium, France and Luxembourg carried out this project from 2007 to 2013 in order to:

- Provide species resistant to endemic diseases for their renaturation in inland waters.
- Prevent damage from inorganic contaminants that build up in the water, on beds and along banks, through phytoremediation.
- Explore the possibilities of use of the reforestation of the banks for the production of wood and biomass.

Source: KEEP Database
**STRENGTHS**

1. The importance of biodiversity and species with high potential in the different commercialisation modes (seeds, meat, ornamental).
2. The sustainable nature of aquaculture vs. the overexploitation of natural sources (wild fisheries).
3. The availability of natural resources at farms to make them self-sufficient and sustainable (comprehensive production cycle) in terms of raw materials and energy use.
4. Currently established productive activity in the sector. The existence of a core of established companies and (small) producers considering the exportation of a significant portion of their production in the short and medium term.
5. High domestic demand (unmet), and potentially very high abroad.
6. The existence of comprehensive technological packages for production with minimal need for adaptation by the fish farmer.
7. The existence of a national policy and legislation governing the field of aquaculture.
8. The availability of a certain number of support instruments provided by the Government.
9. The availability of support institutions for the sector.
10. The availability of training / educational institutions on both sides of the border.

**OPPORTUNITIES**

1. The need to move towards a sustainable production model as a result of environmental pressures.
2. Aquaculture as an opportunity for territorial development in terms of environmental sustainability.
3. Aquaculture as a profitable option to avoid the seasonal nature of traditional fishing operations or other activities existing in the area.
4. High production potential based on the conversion of agricultural land to aquaculture, as well as the potential introduction of low technology (investment) on existing farms.
5. The existence of a small group of producers committed to the activity (cluster) and to the cluster business vision in the middle/long term.
6. Great interest and commitment from different stakeholders to turn the sector into an engine driving territorial development.
7. Opportunity for the attraction of investment in the processing industry.
8. Great capacity to positively impact other related sectors (agriculture, raw materials, tourism, etc.).
9. Preliminary work by certain institutions (laboratories) for the provision of quality seeds to farmers.
10. Preliminary work by certain institutions in technology for its subsequent transfer.
11. The possibility of education/training the heirs to aquaculture farms for their progressive improvement and the introduction of technology.
12. Differences in the characteristics of each region that make cross-border collaboration, through a cluster and a macro border region, complementary and worthy of consideration.
13. The prior existence of commercial cooperation between the different segments of the value chain and between different regions (the municipalities closest to the border), which may facilitate progress towards other forms of cooperation (such as technological-knowledge).
14. The prior existence of scientific and technological collaboration initiatives in the field between institutions and regions (IIAP, INPA, IFAM, IDAM, etc.) (Informal cooperation).
15. The existence of previous experiences with transnational and interregional training/education by institutions in the different regions.
16. The gradual emergence of formal and non-formal education linked to the sector by leading universities and research institutes in order to train human resources.
**WEAKNESSES**

1. The low technological level of the farms and the activity in general.
2. Excessive traditionalism in aquaculture (rejection of change, improvements, etc.).
3. Little or no corporate culture (most of the farms are for subsistence or based on natural extraction).
4. Little or no professionalisation of aquaculture farms.
5. Seriously deficient technical expertise with regards to aquaculture farms and a lack of qualified staff/workforce.
6. Great fragmentation of the aquaculture value chain.
7. Most economic activity lying outside the legal sphere (ignorance and lack of information).
8. Problems related to the availability and quality of raw materials in various segments of the value chain.
9. The low quality and lack of product certification and standardisation.
10. Lack of common criteria (approval, certification, standardization, branding, etc.) for production and marketing, and the lack of a public certifying institution.
11. The limited use of a credit amongst culture producers.
12. The lack of critical mass for international markets, as well as a comprehensive approach to marketing.
13. The lack of a common brand image for the region/value chain (there is no distribution model).
15. Legislation not adapted to SMEs and micro SMEs (activities related to subsistence).
16. Public Administration with rapidly shifting policies; vulnerability to policy changes (political cycles).
17. The problem of a multi-level political decision-making apparatus, and the lack of a formal cross-border collaboration framework between countries.
18. A low degree of collaboration between producers, knowledge generators and the productive sector.
19. A serious lack of information at all levels (farms, technology foresight, and market analysis).

**THREATS**

1. Irregularity/seasonality of the farms/activities, and a lack of consistency in the provisioning of products from the natural environment.
2. Market failures arising from a lack of information and market power between the different segments.
3. High food supply costs for fattening (70% of costs).
4. Unavailability of financing (public support frameworks) by the Government.
5. Funding opportunities not adapted to the needs and characteristics of the aquaculture activity/product.
6. Difficulty obtaining financing for certain sections and types of investment.
7. The individualism of producers, resulting in the lack of common vision of the sector (cluster) and the consequent difficulties in generating a unique value proposition (competitive advantage of the cluster-territory).
8. The lack of qualified labour for the activity.
9. The lack of training / education courses in productive chains.
10. Significant bottlenecking in the area of logistics, especially due to problems in maintenance of the cold chain, as well as energy as a cost element on the farms.
11. The reduction in the availability of usable water due to the contamination of natural bodies of water, pollution, urban expansion, etc.
13. A potential demographic problem at aquaculture sites due to migration to urban centres.
7/ CLUSTER STRATEGY AND ACTIONS

7.1 / Strategy

With a view to advancing in this analysis to produce a proposal so that the regions can define a policy and actions for the Peru-Brazil cross-border area with regards to aquaculture, we propose first addressing the internal aspects (weaknesses and strengths of the territory and activity) in order to take advantage of opportunities.

Thus, structuring the various items in the SWOT, and integrated around six aspects, an assessment has been carried out in terms of relative positioning, as shown in the following chart:

Relative positioning in SWOT terms of the six aspects for Brazil/Peru cross-border cooperative strategic action

As the graph shows, each one of the different strategic aspects features a different positioning in SWOT terms, which will determine the differentiation of the strategy to be followed for the cross-border area in question.
RESOURCES-TECHNOLOGY In this strategic aspect, the elements included in the SWOT point to a very low starting point in terms of availability of technology on the farms (and regions, in general). There are research institutions that are carrying out technology projects in the field, but their work is not taken advantage of (transfer difficulties). In most cases technology cannot be implemented at the fish farms due to the lack of qualified personnel.

The technological aspect is, however, definitely one of the greatest opportunities (along with education and training), as it could boost the productivity of the farms in the sector and, consequently, their profitability. This would make it possible to multiply the scope of the sector in terms of its contribution to the generation of employment and wealth, and the territorial development of the areas concerned.

In technological terms, in addition to the enhancement of the business network, and technologies aimed at increasing productivity, also essential would be those capable of responding to two common challenges (or bottlenecks): the product's distribution and logistics (particularly cold chain technology), and energy consumption (technologies capable of rendering the farms self-sufficient by exploiting the agricultural and forest resources already available).

While a strength is the existence of research institutions that are already working on the issue, in collaboration with international entities in this area (with Europe, where packages of integrated technology are now available), it could mean, in the short term, a major breakthrough in the sector and the beginning, in the medium term, of effects in terms of its contribution to regional growth.

RESOURCES-FINANCING: Financing is one of the aspects that in both the diagnosis and the visits surfaced as a manifest weakness and, above all, a threat to the development of the aquaculture sector and its contribution to regional development.

While there are some providers of financing with some resources available, and although the Government could provide some funds and commitments, the reality is that the funding is not always adapted to the specific needs of the product, to the aquaculture business model, and the reality (and situations) of the producers (their credit culture) themselves, which strangles financing and significantly limits its impact.

It is, in any case, a threat to the future of the sector, especially due to the fact that, even with financing, the use of it could fail to have effects on the actual transformation of the aquaculture farms and the industry as a whole, generating a pernicious effect of uncertainty for investors (both public and private) that limits, or even eliminates, funding.
RESOURCES-NATURAL SURROUNDINGS: The natural elements in the project's different regions, and the aquaculture sector as a whole, clearly represent the most obvious strength, in accordance with the SWOT analysis.

The natural surroundings in question, in terms of the nature of the land and the great availability of water, as well as forest resources (agricultural and forest), constitute the differentiating factor and the competitive advantage of the value chain in this cross-border area. In fact, it not only entails a number of features that are virtually impossible to replicate, but also positively affects production costs and the production process, etc. This natural "wealth," therefore, is an opportunity, if strategically utilized. To do this it will be necessary to take into consideration the remaining aspects (the use of technology, financial resources and training levels, social capital and appropriate governance).

Biodiversity and this natural "wealth" are also evident with reference to the different possibilities involved in the exploitation of fishing: extractive, aquaculture and ornamental. Each of these methods is linked to a specific exploitation model, with the opportunities and threats that each entails. Aquaculture represents, in this regard, a clear opportunity to overcome the limitations that laws and seasonal restrictions place on extractive (traditional) fishing.

Wealth and biodiversity are also evident with regards to the range of species that can be exploited, for a range of uses: tilapia, shrimp, gamitana, paco, black prochilidus, paiche, etc.

We should not forget, in any case, that the area's natural assets exist in a balance that must be preserved, as otherwise their associated strengths could become threats in the medium and long term. In this regard water pollution, land degradation and / or misuse, deforestation, the depletion of fry for breeding, etc. could pose problems. Thus, it is important to ensure sustainability through the intelligent combination of technological resources and a strong governance system.

Moreover, with regards to the environment, it should be noted that one of the most important threats / weaknesses for the development and consolidation of the aquaculture sector (and for the whole set of economic activities in these regions) has to do with the difficulties of logistics and transport. This is one of the major bottlenecks for the sector, due to the difficulties involved in getting products to their final markets.

Along this line, reference should also be made to the importance of energy input, whose high costs and limited availability make it an important element in the industry's cost structure (and for the entire economy of these regions in terms of their potential for development).
EDUCATION / TRAINING and SKILLS: One aspect most frequently identified as key to facilitating change and the advancement of aquaculture as a viable project for territorial development is the need to improve the training, education and skills of those involved in the value chain.

The technical level of the producers, as well as potential employees throughout the value chain, is relatively low, in general. They are mostly engaged in subsistence farming, outside the legally regulated sphere (informal). This weakness stands as a major threat also because it stifles the capacity to introduce technology, but also due to the fact that people are reluctant to accept (and desire) a change from the status quo.

This also limits the opportunity to export production, largely due to the lack of an entrepreneurial culture on many subsistence farms. There exists a small number of producers with a more commercial vision and view to business development that, after a period of consolidation, are currently in the preparation phase for export, but require integrated demand (from the three regions) to provide sufficient supply for the markets that could be served (United States, Europe, Japan, etc.).

Nor does it seem that the actions undertaken by the Government and research institutions have contributed to improving this aspect, indicating a certain methodological and instrumental inability to do so. This is a known difficulty in the three regions, but one that has been impossible to rectify for quite some time.

Nevertheless, there is an opportunity, given the increased awareness of this issue, interest in addressing it at every level, and by all the stakeholders, and the existence of training and research institutions that can (with the necessary stimulation and awareness) make a difference. It should be emphasized, however, that the changes will not, in any case, yield short-term results.

CAPACITIES-SOCIAL CAPITAL Along with the lack of education and training, there appears a second handicap that affects not only the field of aquaculture, but the whole economic structure of these regions and, more specifically, the border area.

There is a marked lack of any perception or feeling (awareness) of belonging to a value chain that is conscious of itself and reflects a product to be produced and marketed. The reasons for this are largely traceable to the lack of training, education and skill building, as previously indicated. Its consequences are evident in the clear disorganization of the production system, which generates productive "chaos" throughout the different segments of the value chain, in which there are gaps, uncertainty, and other market failures that ultimately result in a sector that is informal, unspecialised, and unable to provide an adequate response to demand, both domestic and, especially, foreign.

In this regard, and related to the training and educational needs of employers, it would be necessary to increase awareness of the business in order to make the leap and be aware, at the sector level, of the potential that exists in exportation, where margins would be substantially greater. This would require an analysis of the potential demand, regionally, nationally and internationally (on which there are already figures, due to the incipient actions of some producers), of the requirements of the new markets (certification issues
and legal-sanitary requirements), and existing capacities with regards to supply (which need to be comprehensive across the three regions).

A "professionalised" and specialised value chain tends to be linked to the existence of a cluster, which is developed and consolidated to the extent that several elements are in place, and there exists social capital amongst its members. This capital makes it possible, in addition to involving the parties in a more intense and committed manner, to voluntarily direct efforts towards joint rather than individual improvements (which is what fragments efforts and diminishes the overall result). Social capital should allow the joint action along the value chain to be greater than the sum of its individual actions, such that the positive results generated by the process are enjoyed by each and every one of the parties involved.

In the area there is currently an opportunity linked to the existence of a set of aquaculture owners and entrepreneurs committed to this vision, and a certain degree of social capital, which could be extended to other actors in the field of R&D, agents with a capacity for financing and, of course, the Government.

In the regions of Peru (San Martin and Loreto) these groups of entrepreneurs and farmers could average 20 or 30 per region, according to the authorities' estimates. Some of the markets they are interested in targeting include the United States, Europe and Japan (plus Southeast Asia). In the case of the State of Amazonas there could be farm operations with similar characteristics in border municipalities (Atalaia do Norte, Benjamin Constant, Tabatinga). In fact, the Government could lead a cluster "sowing" process, drawing upon this committed group of agents to get started.

There certainly seem to be the ingredients necessary so that this emerging cluster initiative, with the necessary support and assistance, could set things in motion, generating a snowball effect impacting other producers, encouraging them to share this joint work dynamic for the benefit of the sector and the rest of the agents making it up, and the whole territory.

CAPACITIES-GOVERNANCE: Finally, governance, as an element linked directly to social capital, represents an aspect on which work must be done to efficiently exploit the aforementioned resources (technology, finance and the environment).

In the case of the regions involved in the project, governance stands at a nascent stage of development. It is generally characterised by isolated operations amongst the agents involved that, when arising, consist of spontaneous and informal relationships.

With regards to the governance of the system as a whole, there are regulations and strategic approaches undertaken by the Government aimed at formalising and regulating the system, but there is still work left to be done: improving support tools, more strategic approaches, reducing the seasonal nature of the political cycle, greater availability of information, etc.

In this regard, there are certain problems of instability in the cross-border relations / arrangements, and with regard to Customs matters between the two countries that directly or indirectly affect cooperation between the regions along the Brazil-Peru border area. These difficulties, however, are really only solvable at the supra-regional level.

With regards to governance of the R&D system there is a significant gap between knowledge generators (universities and research institutes, among others) and producers.
This gap occurs both in relation to language and the different parties’ objectives and priorities, and includes cultural differences between the two groups.

Finally, with regards to the governance of the productive value chain itself, and related directly to the elements indicated in the case of social capital, there is a disconnect between the various segments, where in some cases there is commercial collaboration (generally without a global vision of the value chain/cluster), but not technological and more strategic forms of it (e.g. for improving aspects related to marketing, logistics or processing), which could be carried out through basic association formulas.

In order to define actions that promote strengths and opportunities, and address weaknesses and threats, all the elements included in the analysis have been structured into 6 large groups. Used as a basis were the resources that would allow for progress towards territorial development within the framework of a joint strategy.

In this way a strategic plan for the Amazon Aquaculture Cluster is presented that serves as a short and medium term (a period of 5 to 6 years) guide for a potential formal structure that progressively integrates the different agents and makes it possible to systematize collaborative dynamics between them in order to respond to the challenges of each of the six areas considered strategic.

The Amazon Aquaculture Strategic Plan features a core consisting of the cluster’s vision and mission, the strategic objectives pursued, and a series of strategic lines designed to achieve the objectives set in the short- and medium-term.

Some projects are included that have emerged during the guidance work with the different agents forming the value chain and that, foreseeably, could benefit the Cluster’s formal structure. These projects, along with the strategic lines, are specified in milestones and indicators for the period.

Finally, included is a governance proposal for the formal structure of the Aquaculture Cluster through non-profit private or public/private instruments.
RESOURCES to consider:

key elements for the territorial development of the cross-border area

**TECHNOLOGY**

- **W.1.** The low technological level of the farms and the activity in general.
- **W.5.** A major lack of technical expertise at the aquaculture farms and a lack of qualified personnel/labour capable of modernising (incorporating and adapting technologies) them.
- **W.14.** Infrastructure that is not adequate for aquacultural production.
- **0.10.** Preliminary work by certain institutions on technology for its subsequent application to the production network.
- **S.6.** The existence of comprehensive technological packages for production, with a minimal need for adaptation by the aquacultural producer.
- **S.10.** The availability of educational/training institutions on both sides of the border

**FINANCING**

- **W.11.** The lack of a credit culture amongst aquacultural producers.
- **T.4.** The lack of available funding (public support frameworks) from the Government.
- **T.5.** Possibilities of funding not adapted to the needs or characteristics of the aquaculture activity/product.
- **T.6.** Difficulty accessing financing for certain sections and types of investment.
- **0.3.** Aquaculture as a profitable option to avoid the seasonal nature of traditional, extractive fishing, or other types of activities existing in the area
- **0.4.** The high profitability of the activity compared to other production options in the area
- **0.7.** The opportunity to attract investments in the activity, on the side of the processing industry.

**NATURAL SURROUNDINGS**

- **T.1.** Irregularity/seasonal nature of the farms/activities, and lack of consistency in the provisioning of the product supply by the natural surroundings.
- **T.10.** Major bottleneck in the area of Logistics.
- **T.11.** The reduction of available water due to the contamination of natural bodies of water, pollution, urban expansion, etc.
- **0.1.** The need to advance towards a sustainable production model as a consequence of environmental pressure on the area.
- **0.2.** Aquaculture as an opportunity for territorial development in terms of environmental sustainability through the development of self-sufficient and self-sustainable farms.
- **0.4.** Potential major increase in production based on the conversion of agricultural areas over to aquaculture, as well as the potential introduction of low technology (investment) on current farms.
- **0.8.** A major capacity to impact other related sectors (Agriculture, Raw Materials, Tourism-Gastronomy as a form of diversification).
- **0.9.** Differences in the characteristics of each region that render cross-border collaboration through a macrocluster and a cross-border macroregion complementary and attractive.
- **S.1.** The importance of biodiversity and species with great potential in the different commercialisation modes (seed, meat, ornamental)
- **S.2.** The sustainable nature of the aquacultural activity in contrast to the overexploitation of natural sources.
- **S.3.** The availability of natural resources at the farm to make them self-sufficient and sustainable (comprehensive production cycle)
- **S.5.** High internal demand (not met), potentially very high abroad.
- **W.4.** A major capacity to impact other related sectors (Agriculture, Raw Materials, Tourism-Gastronomy as a form of diversification)
- **W.6.** Great fragmentation of the aquaculture value chain
- **W.7.** The existence of gaps in the value chain (there are no processing plants for the product).
- **W.8.** Problems related to the availability and quality of the raw material in diverse segments of the aquaculture value chain (quality seeds, food for fattening, etc.)
- **W.12.** The absence of the critical mass to access international markets
CAPABILITIES to consider:

key elements for the development of the cross-border territory

GOVERNANCE

W.10. The lack of common criteria for production and commercialisation (homologation, certification, standardisation, brand image, etc.) and the absence of a certifying public institution
W.15. Legislation not adapted to SMEs and micro SMEs (subsistence-related activities)
W.16. Public Administration with frequently-shifting policies in response to political cycles
W.17. Multi-level political decision-making problems (priorities between countries and regions on both sides of the border)
W.18. The lack of formal cross-border collaboration between countries
W.21. A major lack of information at all levels (maps of farms, possible technology, and analysis of markets)
O.6. Interest and commitment by the different agents involved in converting the sector into an engine driving territorial development
O.9. Preliminary work by certain institutions (laboratories) for the provisioning of quality seeds to producers
S.7. The existence of a national policy and legal regulation in the field of aquaculture.
S.8. The availability of a certain number of support instruments, provided by the Government.
S.9. The availability of sector support institutions

TRAINING/EDUCATION/CULTURE

W.2. Excessive traditionalism in aquacultural activities.
W.3. Scarce or non-existent business culture (most farms are for subsistence or natural extraction)
W.16. The lack of educational/training courses in production chains.
W.18. The lack of qualified labour for the activity
O.11. The possibility of education/training for the inheritors of aquacultural farms for their progressive improvement and the introduction of technology.
O.14. Previous informal collaboration in the technological/scientific sphere between institutions and regions
O.15. The existence of previous interregional and transnational educational experiences through training/educational institutions in the different regions
O.16. The progressive appearance of formal and informal education linked to the sector at leading universities and research institutes to train human resources
S.10. The availability of educational/training institutions on both sides of the border
T.2. Market failures due to the lack of information and market power amongst the different segments, which generates inefficiency, reduces profitability, and limits economies of scale.

SOCIAL CAPITAL

W.7. Most economic activity outside the legal spheres (ignorance and lack of information)
W.9. Low levels of quality and the lack of product certification and standardisation
W.10. The lack of common criteria (homologation, certification, standardisation, brand image) for production and commercialisation
W.13. The lack of a region/value chain brand image (no distribution model)
W.20. Low collaborative level between producers, knowledge generators and the production network
O.5. The existence of a small group of producers committed to the activity (cluster) and with a cluster-oriented vision
O.13. Previous commercial collaboration as a way to facilitate progress towards other forms of collaboration (technological)
T.7. The individualism of producers, which results in a lack of a shared vision of the sector (cluster) and difficulties offering a unique value proposition (competitive advantage of the cluster/territory)
T.12. Conflicts arising from water use in rural communities
7.1.1/ Mission and Vision of the Cluster

The Amazon Aquaculture Cluster seeks to serve as a landmark project and to represent the entirety of the aquaculture sector and its related activities in the area on the Peruvian and Brazilian border (extending to Colombian territory) through the systematisation of stable, on-going collaboration dynamics between its members. In short, the opportunity offered by collaboration aims to contribute to the competitiveness of the aquaculture industry as a whole and, more generally, progress in the border territory, generating wealth, jobs and a higher quality of life for its inhabitants.

In this regard, taking into account the initial diagnosis, and the identification of the challenges and priorities of the different regional stakeholders, the Amazon Aquaculture Cluster shall be governed in accordance with the following principle:

THE CLUSTER'S MISSION

To act as a representative forum for the sector, contributing to the competitive improvement of aquaculture and related activities through innovation, sharing good practices carrying out collaborative projects and acting in a coordinated and aligned manner in the pursuit of a more favourable competitive framework.

In addition, the Amazon Aquaculture Cluster harbours an ultimate, long-term goal for the entire aquaculture sector, in the area along the border between Peru and Brazil (extending into the area of Colombia), specified by its vision, it being the following:

THE CLUSTER'S VISION

To position the aquaculture sector in the border area of the Amazon as an international reference point, establishing it as a forum for improved competitiveness, contributing to raising the economic and social level and preserving the area along the Peruvian and Brazilian border in the context of a global economy based on value, differentiation and innovation.
7.1.2/ Strategic objectives

Below are included the strategic objectives which, based on a SWOT analysis, will seek to respond to the challenges identified facing the Amazon Aquaculture Cluster in the broader socio-economic framework of the three regions (San Martin, Loreto and the State of Amazonas):

**OBJECTIVE 1**

Promoting **GROWTH** and **COMPETITIVENESS** throughout the value chain of aquaculture and directly related economic sectors. Specifically:
- *(Public and private) agents actively involved in its structure.*
- *The border territory as a whole, contributing to the generation of wealth and employment based on the opportunity that aquaculture represents.*

**OBJECTIVE 2**

Securing the progressive involvement of different (public and private) agents making up the aquaculture cluster through dynamics of **COOPERATION** that contribute to developing shared group identity, increase mutual knowledge, **SOCIAL CAPITAL** and confidence for the systematization of formal relationships over time.

**OBJECTIVE 3**

Forging a strong aquaculture business network that can compete in all kinds of markets (domestic and international), promoting its development through activities like **INNOVATION, R&D, and TRAINING AND ENTREPRENEURSHIP** in aspects key to the aquaculture sector.

**OBJECTIVE 4**

Stimulating and boosting the aquaculture sector in the border regions of Peru and Brazil (expandable into Colombia) to establish a **BENCHMARK PLATFORM**, trinational and even global, in the area of aquaculture competitiveness and innovation.

**OBJECTIVE 5**

Endeavouring to achieve the full **INTERNATIONALISATION** of the Amazon Aquaculture Cluster, and the various agents operating in it, by positioning it in forums and on networks, and through internationally strategic projects and actions.
### Strategic lines

To achieve the strategic objectives set, the plans calls for work on a number of aspects located along the following strategic lines, their results being manifested in concrete actions and projects (next section).

<table>
<thead>
<tr>
<th>LINE</th>
<th>Strategic line</th>
<th>Key issues for the action identified in the diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COOPERATION to achieve economies of scale, a shared image, and exploit synergies and benefits yielded by collaboration.</td>
<td>GOVERNANCE, SOCIAL CAPITAL</td>
</tr>
<tr>
<td>2</td>
<td>INNOVATION to become a landmark project by differentiating value in unique and exclusive niches on the international markets</td>
<td>TECHNOLOGY, EDUCATION AND TRAINING</td>
</tr>
<tr>
<td>3</td>
<td>GROWING to achieve critical mass, sufficient representation and a predominant position relative to third parties worldwide</td>
<td>NATURAL SURROUNDINGS, FINANCING</td>
</tr>
<tr>
<td>4</td>
<td>INTERNATIONALISING to reach new, larger, more sophisticated markets, and take advantage of opportunities of globalization</td>
<td>ENCOMPASSING the different aspects</td>
</tr>
</tbody>
</table>

**Example 10: Gaia Project. The Cluster Experience. Quadruple Helix, Innovation and International Excellence**

[Diagram: A NEW CLUSTER MODEL]

Source: INFYDE
Cooperation is a key aspect for the consolidation of the cluster by progressively fostering a sense of identity in the group, amongst its members vis-à-vis third parties, and the alignment of its efforts towards a set of shared needs.

The diagnosis carried out, verified and enhanced by in-depth exploration in the field with the different stakeholders involved in the aquaculture value chain of the three regions, indicated two critical aspects related to their capabilities that could be addressed through dynamics strengthening cooperation: social capital and governance.

Cooperation and social capital

With regards to SOCIAL CAPITAL, there exists along the entire value chain a marked lack of perception and feeling (awareness) of belonging to the specific field of aquaculture production, this having important implications for the system's current lack of structure, which generates production-related "chaos" along different segments of the value chain, gaps in it, uncertainty and other market failures. All this makes aquaculture in the three regions an informal sector featuring low levels of skill and specialisation, and incapacity to deliver supply adequate to meet demands internally, and especially abroad, where relevant.

Working towards the strengthening of social capital will make it possible, in addition, to engage the parties in a more intense and committed manner, to voluntarily direct efforts towards joint rather than individual improvements (which is what fragments efforts and diminishes the overall result).

Moreover, in the three regions there seems to be an opportunity due to the existence of a set of aquaculture owners and entrepreneurs committed to this vision, with social capital that could be extended to other stakeholders in the field of R&D, agents with financing capacity and, of course, with the Government:

- In the case of the regions in Peru (San Martin and Loreto) there could be some 20 to 30 of these groups of entrepreneurs and farms per region, according to the authorities' estimates. Some of the markets they intend to supply with their production include the United States, Europe and Japan (plus Southeast Asia).
- In the case of the State of Amazonas there could be farm operations with similar characteristics in border municipalities (Atalaia do Norte, Benjamin Constant, Tabatinga).

In the short term, an element that could contribute to strengthening social capital would be sensitization and a shared, identity-generating vision of the business, to make not just a quantitative leap, but also in terms of existing potential for export, where margins would be substantially greater. This calls for an analysis of the potential demand (regionally, nationally and internationally), of which there are already indications, due to the incipient action of various producers; the requirements of new markets (in aspects related to certification and sanitary/legal regulations); and the real capacities of the supply (which must be comprehensive, across the three regions).
Cooperation and governance

As for GOVERNANCE, in the three regions there exists a nascent stage of development. It is usually characterized by a single operation of the agents and, if given, relationships are spontaneous and informal.

Currently there are regulatory and strategic approaches from the Administration seeking to formalise and regulate the system, but there are still aspects that work for which the cluster can be a channel and permanent forum: improved support tools, more strategic approaches, reduction seasonality of the political cycle, greater availability of information, etc.

The cluster as a regular forum for consultation and proposed actions must work to reduce instability in relationships and cross-border agreements, for example, with regards to Customs matters between the two countries which directly and indirectly affect cooperation between the regions of the Brazil-Peru border area.

With regards to governance of the R&D, there is a significant gap between knowledge generators (universities and research institutes among others) and producers. The Cluster can also work to reduce the gap that occurs due to language, and the objectives and priorities between R&D generators and businesspeople, including cultural differences between the two groups.

COOPERATION: What to work on in the short and medium term

The line of cooperation to within the framework of the Cluster should seek to strengthen ties (systematisation of relations, formal collaboration, etc.) between the different members and enrich the social capital (trust, etc.) along the entire aquaculture value chain in the Amazon. Progress can be made in three key areas for the Cluster:

a) Facilitating mutual understanding between Cluster members and promoting cooperation with other Clusters, increasing available information on joint opportunities, reducing uncertainty and increasing confidence, among other aspects of interest.

b) Working to reduce instability in cross-border relationships and agreements and to systematize relationships that informally already exist between the various (public and private) agents and productive areas of knowledge.

c) Developing an ability to influence enough to pose challenges, needs and actions to the institutions and bodies that are crucial in shaping and configuring an environment favouring the Cluster.
LINE 2 INNOVATING to become a leader

Currently innovation is the cornerstone of any competitive advantage. It is the process by which products and services are created and improved, making it possible for organisations to stand out and become leaders.

The diagnosis made, verified and enhanced through in-depth work in the field with the different stakeholders in the three regions indicated two critical aspects related to their capabilities that could be addressed by improving innovation throughout the aquaculture value chain: education/ training, and technology.

Personnel innovation and training

As for the need for EDUCATION / TRAINING this appeared as one of the most basic and necessary aspects to facilitate change and progress in the aquaculture sector. Thus, the diagnosis revealed that the technical level of producers, as well as potential employees, is relatively low in most cases, confined to subsistence farms and lying outside the legally regulated sphere (informal). This weakness constitutes a major threat because it stifles the capacity to introduce technology, but also due to the fact that people are reluctant to accept (and desire) a change from the status quo.

Therefore, one of the Cluster's key actions would be to promote and facilitate improved technical capabilities amongst producers and employees in the sector, and also to develop a business culture, which is currently one of the obstacles to shifting much of the informal activity along the border over to formalised, professionalised activity forming part of the legally-regulated economy.

The Cluster can, and should, secure support from the small number of producers who are already more sensitive to commercial concerns and business development and that, after a period of consolidation, are currently in a phase of preparation for export. Imitation dynamics should be generated to incorporate the bulk of informal/non-professionalised producers through the experiences and benefits already achieved by "leaders."

The Cluster must work with these "leading" producers in order to gradually structure and integrate a supply system at the regional level (across the three regions) that provides sufficient volume to provision the markets that could be targeted (United States, Europe, Japan, etc.).

In any case, the Cluster should support the different actions that have been launched by the Government and research institutions, but that, due to different difficulties or technical, methodological and instrumental incapacities, have not succeeded. The Cluster should complement and/or support existing actions, and avoid duplication.
Innovation and technological capabilities

With regards to **TECHNOLOGICAL CAPABILITIES**, the results of the SWOT point to a very low starting point in terms of the availability of technology on farms (and, in general, in the regions).

However, there are research institutions that are carrying out technological projects that may be considered international landmarks in the field, but they are not fully taken advantage of (transfer difficulties). In addition, in most cases the technology cannot be implemented at the fish farms due to the lack of qualified personnel.

Therefore, one of the Cluster's high-priority actions must be to take advantage of what is, by far, one of its greatest opportunities (along with education and training). In this regard the Cluster's work to **identify, pool, transfer and apply existing and available technology solutions in the short or medium term** to the critical mass of producers could mean, for the whole sector, an increase in the farms' productivity and, consequently, profitability. This would make it possible to multiply the scope of aquaculture in terms of its contribution to the generation of employment and wealth, the territorial development of the Amazon border between Peru and Brazil and, by extension, Colombia.

In technological terms, based on the enhancement of the business network (in addition to incorporating technologies aimed at increasing productivity), the Cluster should consider **technological actions aimed at** addressing two common problems (or bottlenecks): the **Product's distribution and logistics** (especially with regards to the cold chain) and **energy consumption** (technologies capable of making farms self-sufficient, taking advantage of the agricultural and forest resources available).

While one strength is the existence of research institutions that are already working on this issue, collaboration with international entities in this area (with Europe, where packages of integrated technology are now available), could mean, in the short term, a major breakthrough in the sector and the beginning, in the medium term, of effects in terms of its contribution to regional growth.
**INNOVATION: What to work on in the short and medium term**

For the entire Amazon Aquaculture Cluster innovation should be a crosscutting element impacting each and every action. It should become an objective for owners and entrepreneurs, as well as entities linked to aquaculture. This will allow the group and each of the participants to strive for excellence and to stand as an international leader. To this end, the Cluster should work on the development of three complementary aspects:

a) **Extending education and training** to a growing number of property owners, who may currently be producing in an informal manner.

b) Working towards **a better understanding of the technological capabilities of the stakeholders and entrepreneurs** through group dynamics and collaborative sessions.

c) Promoting and ensuring the resources to **identify, define and formalise collaborative innovation and competitiveness projects** between the different stakeholders making up the aquaculture value chain, both those formally participating in the Cluster and those in the sector lying outside of these dynamics.

d) Exploring the use of results-based **responsibility frameworks**, which are proving very useful in guiding all kinds of groups towards the achievement of their goals.

**LINE 3**

**GROWING** to achieve critical mass

Size is another key to progress towards the realisation of the cluster’s vision. The growth of the formal structure through the progressive incorporation of members (public and private) will make possible, among other things, the **enhanced representation of the activity** throughout the Amazon’s aquacultural operations, and, consequently, a greater capacity to influence third-party bodies (national and multilateral).

The diagnosis made, verified and explored in-depth with the different stakeholders, identified two critical issues in terms of the opportunities and resources Amazon Aquaculture Cluster agents would have: the **availability of financing** and the **natural assets in the area** (among them the sector’s critical mass).

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28 Like RBA (Results-Based Accountability), set forth by Mark Friedman in *Trying Hard Is Not Enough*, FPSI Publishing, 2005
Growth and financing

The issue of **FINANCING** is one of the aspects which was identified, through the diagnosis and visits by European experts to the area, as a manifest weakness and, above all, a threat to the development of the aquaculture sector and, as a result, its contribution to territorial development in the Amazon area.

Although there are financing entities with a certain capacity to issue resources, and though the Government may also be able to provide funding and make commitments, the reality is that **financing is not always adapted to the concrete needs of the product, the aquaculture business model, and the reality** (and situation) of the producers themselves (their credit culture), which stifles financing and considerably limits its impact.

The Cluster must work **to facilitate the channelling of resources available at the regional, national and international levels to producers and knowledge-generating institutions able to carry out production improvement projects** having an impact on the development of the aquaculture sector and the territory as a whole.

It is, in any case, a threat to the future of the sector, especially due to the fact that, even with financing, the use of it could fail to have effects on the actual transformation of the aquaculture farms and the industry as a whole, generating a pernicious effect of uncertainty for investors (both public and private) that limits, or even eliminates, funding.

Growth and environment

As for elements in the **NATURAL SURROUNDINGS** at the disposal of the regions and the aquaculture sector as a whole, they clearly represent the most obvious **strength**, according to the SWOT analysis, and may be the foundation upon which to build the Cluster's competitive advantage at the international level.

Thus, the Cluster must **foster an appreciation of the territory's natural assets**, the characteristics of the soil and hydric resources available, the Amazon's resources (agricultural and forest-related), and all the different elements making up the value chain's competitive advantage in the cross-border area. These characteristics are not only virtually impossible to replicate, but also positively affect production costs, the production process, etc.

Biodiversity and natural "wealth" can be appreciated in the case of the different possibilities for the exploitation of fishing: extractive, aquaculture and ornamental. The Cluster must work **to grow not only quantitatively, but also qualitatively; for example, through the diversification of production and the marketing of fish products**. The range of species that are exploited in terms of extractive fishing and aquaculture, including for ornamental species, includes tilapia, shrimp, gamitana, paco, black prochilodus, paiche, etc.

We should not forget, in any case, that the area's natural assets exist in a balance that must be preserved, as otherwise their associated strengths could become threats in the medium and long term. In this regard water pollution, land degradation and/or misuse, deforestation, the depletion of fry (for breeding, etc. could pose problems. To achieve this, a clever combination of technological resources with a good system of governance can help.
Since each of these fishery products is linked to a specific model of exploitation, with the opportunities and threats that each implies, the Cluster must **work to professionalise and extend different models of exploitation in a sustainable and balanced** manner, with the natural resources that sustain them, with aquaculture constituting a clear opportunity to overcome the limitations that legislation and seasonal limitations place on extractive (traditional) fishing.

**GROWTH: What to work on in the short and medium term.**

The growth pursued by the Amazon Aquaculture Culture should not be merely **quantitative** (gauged by the number of agents participating and collaborating in the Cluster), but also **qualitative** (a diversity of entities, niche activity within the value chain, types of aquaculture products, markets, etc.). To this end, the Cluster should work on the development of the following complementary aspects:

a) Promoting the execution of innovation and competitiveness projects among entrepreneurs and other Cluster stakeholders through **the pursuit of financing and its presentation** to the relevant agencies (public and / or private) at the various levels (regional and national governments in Peru and Brazil, multilateral American and/or European organizations, etc.).

b) **Expanding the base of members who actively and systematically collaborate** in the different regions in terms of the number and nature of entities forming the aquaculture value chain, to achieve, in the medium term, a higher degree of representativeness of the producers and entities in the aquaculture sector overall.

c) Promoting **the diversification of the activity** currently represented by producers and institutions likely to collaborate in the Cluster through actions that depend upon:

- **Radical innovations**, which may lead, for example, to new activities that can be implemented by the producers themselves: aquaculture varieties, gastronomic exploitation of the resource, tourism, related agricultural products, etc.

- The incorporation of **new participants** from segments related to aquaculture but not yet represented in the Cluster, in such a way that, in the medium and long term, the Cluster is representative of the whole value chain affecting aquaculture production (considering, for example, agricultural and ranching activities, the processing industry, etc.).
INTERNACIONALISATION for new horizons

Globalisation is a phenomenon that has shaped the way to compete in markets, regardless of the nature of the economic activity in question. In the case of primary economic activities (production and processing for food), both volumes and prices are largely determined by the behaviour of the major international markets, where trends favour differentiated and value-adding products, as opposed to commodities as way to maintain competitiveness.

When generating major innovations that affect the activity in an international context, both aquaculture producers and entities related to the activity must be increasingly integrated into the overall plan in order to remain up-to-date and competitive, and to be participants and generators of significant improvements that can make possible product differentiation.

In this regard the Cluster should bank on a model of open innovation or, in other words, collaborative operation, not only internally, but in an increasingly open manner, with other producers, investors and knowledge-generating institutions in the international arena that can contribute aspects not provided by existing assets in the Amazon. Moreover, this cooperation should be understood broadly, not only with reference to innovation, but also to elements such as access to markets, the identification of best practices, alliances, financing, etc.

However, the line of internationalisation seeks to position aquaculture, and the Cluster's different participants, in the international context in such a way that the different actions proposed in the other lines can be carried out in a manner consistent with the decisive trends in technology and international markets.

INTERNATIONALISATION: What to work on in the short and medium term.

In order to advance towards a global Cluster model based on the concept of open innovation, the Cluster should work on different areas, the most relevant, in the short and medium, being the following:

a) Identifying public and/or private entities at the international level, and especially European, of interest for the establishment of agreements, alliances and bidirectional collaboration relationships with the participants in the Cluster.

b) Carrying out promotional and dissemination work for the Amazon aquaculture value chain, with a common image represented by the Cluster at the different levels (at the national level in each country, and internationally).

c) Positioning on aquaculture networks and platforms key at the international level for members of the Cluster.

d) Identifying projects of an "international" nature to contribute to the strategies mentioned above. Analysing, in particular, the possibilities offered by Horizon 2020 to fund collaborative R&D projects.
7.2/ Cluster Projects

As a complement to the actions described in the previous section, and especially for their specification in terms of scheduling and resources, this section presents projects for collaboration between the different stakeholders (public and private producers and knowledge generators) that will centre more on addressing the specific technical and technological component in each case.

In this regard, we would like to emphasise the importance that the different stakeholders have assigned to collaborative pooling and mutual knowledge, including the market, in order to better identify a larger series of projects that feature, above all, all the possibilities of cross-border collaboration. Also, in several cases European partners have already been identified capable of decreasing the time needed for solutions to reach local producers.

In this regard, below we indicate some of the projects that have been identified initially and also that will also make possible (after their launch) the progressive identification of new ones, due to the component of mutual knowledge and information they feature. While the potential participants in the Amazon value chain are specified, potential international collaborators have not been in each case (as opportunities must still be identified with specific international agents and regions).

1. Study of international demand for the Amazon Aquaculture Cluster.
2. Innovation Hub of the Amazon cross-border cluster in the province of Mariscal Ramón Castilla.
3. Improving the fishing and aquaculture value chain in Ramón Castilla and Yavarí, in the region of Loreto, Peru

Below we provide descriptive factsheets of these collaborative projects, validated by some of the agents worked with during the Plan definition process:
### AMAZON AQUACULTURE CLUSTER STRATEGIC PLAN

#### Project Summary

<table>
<thead>
<tr>
<th>A</th>
<th>Name of the partner supporting the project</th>
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<tbody>
<tr>
<td></td>
<td>Ministry of Foreign Affairs (MRE-Perú) and Ministério da Integração Nacional (MI – Brasil)</td>
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<table>
<thead>
<tr>
<th>B</th>
<th>Project Title</th>
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<tr>
<td></td>
<td>Preparation of a study of the international demand for the production and diversification of Amazon aquaculture</td>
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<tr>
<th>C</th>
<th>Description of the project and its innovative character</th>
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<tbody>
<tr>
<td></td>
<td>One of the critical aspects in order to make progress on the organisation of the Amazon aquaculture Cluster will be the availability of information on the commercial potential of the activity itself, particularly beyond the borders of each region. It is precisely at the international level where the formation of a Cluster and collaboration amongst its members makes sense and is worthwhile, due to the scale of the projects and investments required.</td>
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<td>In this regard, and due to uncertainty regarding the precise marketing potential of the Amazon Cluster's niche products, the stakeholders deemed it critical to have a marketing study on the different species and potential demand for them, in addition to an analysis of their marketing channels, technological needs for production and distribution levels, etc.</td>
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<tr>
<td></td>
<td>With this information, in fact, it will be possible to specify areas for collaboration, technological applicability requirements, and resource needs to address, and the different agents in the Cluster that could resolve them.</td>
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<td></td>
<td>The tasks that will be launched in order to carry out the marketing study are:</td>
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<tr>
<td></td>
<td>1. Identification of production capacities in the three regions (border area) in quantitative terms (number of tons, for example) and qualitative (quality levels, technical characteristics, etc.)</td>
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<td></td>
<td>2. The identification of potential markets for the sale of production: local, national and international markets; and the identification of the necessary technical and quality specifications for the product at the different commercial levels, considered by geographic region</td>
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<tr>
<td></td>
<td>3. Developing a Feasibility Plan, in the short and medium term, for the progressive delivery of the quantities potentially demanded by the markets.</td>
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<td></td>
<td>4. The specification of technology solutions and investments/actions to be undertaken by regional producers and other agents to deliver the quantities and meet the quality standards demanded by the market.</td>
</tr>
<tr>
<td></td>
<td>5. Mapping the distribution and marketing channels of aquaculture products.</td>
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<td></td>
<td>6. Identifying sources of funding and third-party investment to adapt to production requirements.</td>
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<tr>
<td></td>
<td>The RESULT of the tasks for the completion of the Amazon Aquaculture Cluster marketing study will be a list of target markets (quantified and with access requirements identified), as well as a range of actions that will be necessary to satisfy demand, in terms of both quantity and quality.</td>
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</table>

#### Participants

<table>
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<tr>
<th>1</th>
<th>Region of Loreto (Peru)</th>
<th>4</th>
<th>IIAP (Peru)</th>
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<tbody>
<tr>
<td>2</td>
<td>Region of San Martin (Peru)</td>
<td>5</td>
<td>IFAM (Brazil)</td>
</tr>
<tr>
<td>3</td>
<td>State of Amazonas (Brazil)</td>
<td>6</td>
<td>Aquaculture producers</td>
</tr>
</tbody>
</table>
AMAZON AQUACULTURE CLUSTER STRATEGIC PLAN

Project Summary

A Name of the partner supporting the project
Ministry of Foreign Affairs (MRE - Peru)

B Project Title
The development of an innovation Hub in the area of Ramón Castilla as an element bolstering the Amazon Cross-Border Cluster

C Description of the project and its innovative character
The Cluster seeks to transform the aquaculture / fish farming and all its related economic activities, as a cornerstone for the Amazon area’s economic development.
This Hub would arise from public-private collaboration, based on assistance from leading research entities from Peru, Brazil and Colombia in the area, as well as support from local authorities (Ramón Castilla) and businesspeople. This Hub would stand as an international leader, a landmark in the field, comprehensively covering the entire value chain (with regards to research, and economically and socially), making it possible to apply the solutions and benefits to the three countries’ entire cross-border area.
The tasks to be undertaken are:
7. The completion of a specific diagnosis for the Hub in the area of Ramón Castilla based on a general assessment of the Cross-Border area (EU-Peru-Brazil CBRIS Project).
8. Analysis of infrastructure to be included in the Hub (Hub design)
9. Definition the Hub’s governance: strategic decision-making and management structures + Technical Office
10. The definition of the Hub’s objectives and strategic lines for a time frame of 5-7 years
11. Defining the portfolio of services of the Hub’s Technical Office
12. Short-term roadmap (including its launch and development for a period of 3-4 years)
13. Hub follow-up / monitoring system
14. The Hub’s financial plan (estimated investments, operating costs, search plan for funding/investors) + Viability Plan of investments in economic and social terms
15. Hub communications plan (promotion in the area, international promotion + new member recruitment strategy)
The RESULT of the tasks involved in the development of the Hub Strategy will be its implementation with a formal strategic structure, but also an operational one (technical team assigned to management of the Hub), in which there is a minimum number of infrastructures and a physical representation of the members working on the location.

Participants

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<th></th>
<th>Ministry of Foreign Affairs (MRE - Peru)</th>
<th>IIAP (Peru)</th>
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<tr>
<td>1</td>
<td>Region of Loreto (Peru)</td>
<td>SINCHI (Colombia)</td>
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<tr>
<td>2</td>
<td>Municipality of Ramón Castilla (Peru)</td>
<td>Private producers</td>
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<tr>
<td>3</td>
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</tbody>
</table>
AMAZON AQUACULTURE CLUSTER STRATEGIC PLAN
Project Summary

A Name of the partner supporting the project
Research Institute of the Peruvian Amazon - IIAP

B Project Title
Improving the fishing and aquaculture value chain in Ramón Castilla and Yavari, Mariscal Ramón Castilla province, the region of Loreto, Peru (CAVAPEPIS)

C Description of the project and its innovative character
This project aims to contribute to the competitive development of fisheries and aquaculture to improve the quality of life of the rural population in the districts of Ramón Castilla and Yavari, Mariscal Ramón Castilla province.

The project's direct beneficiaries will be the members of associations of fishermen and fish farmers, and small producers in the native communities and the rural population of Ramón Castilla and Yavari.

The indirect beneficiaries will be the students and teachers at educational institutions in the area, as well as family members of the direct beneficiaries.

The project seeks to improve the population's food security by promoting the consumption of fish and fishery products, as well as to raise the levels of competitiveness in the fishery and aquaculture value chain, which is included among the fishing sector's national objectives.

Technical assistance will be provided to improve the fish production processes in controlled environments and the management of populations of the major fish species in the wild, increasing the producers' level of knowledge with regards to business and commercial management, organizing them and linking them to the market through a chain of fish production, incorporating stakeholders such as universities, improving the levels of investment in research and development, and strengthening currently existing comparative advantages. For this purpose the following actions are established:

- Bolstering the transfer of fishery and aquaculture technology, with special attention to gender and cultural identity.
- Boosting the production of balanced feed, concentrates and fry of native species for human consumption.
- Promoting guidelines for the proper management of the main fish species extracted from the wild.
- Generating research, innovation and technological development capacities in the fish-farming sector.
- Organisational, association and business fortification.

Participants

<table>
<thead>
<tr>
<th></th>
<th>Peruvian Amazon Research Institute - IIAP (Peru)</th>
<th>Special Binational Project for the Comprehensive Development of the Putumayo River Basin (Peru)</th>
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<tbody>
<tr>
<td>1</td>
<td>National University of the Peruvian Amazon - UNAP</td>
<td>SINCHI (Colombia)</td>
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7.3/ Cluster Structure

The Amazon Aquaculture Cluster should constitute a **formal structure** of an indefinite, private, non-profit and voluntary nature, made up of aquaculture businesspeople and companies, and those related thereto, as well as public and/or private R&D bodies that directly or indirectly related to the sector.

The objective of this formal structure is to help implement the strategic lines adopted for the entire Cluster, organise and present cooperative projects to enhance the competitiveness of the Cluster's different players, and to contribute to the strengthening of the sector in the three regions.

Given the initial complexity involved in this configuration, which is interregional and encompasses two countries (Peru and Brazil, with the possibility, in the short and medium term, of expansion into Colombia), the proposed structure for the Amazon Aquaculture Cluster is rooted in a vision of it as a **Cluster of Clusters**:

- A **regional level** where a **formal Cluster structure will be established**, in Loreto, San Martin and the State of Amazonas.
- A **transnational level**, where the regional Cluster structures participate, along with governments and entities of a national nature, on a **Cross-Border Steering Committee** to align and represent the whole Cluster, regardless of borders and administrative specifications.

A structure for each regional cluster is planned in Loreto, San Martin and the State of Amazonas, of an approximate type, taking into account the existing collaborative initiatives and each country's legal and administrative peculiarities.
The functions of each body of each regional cluster structure are as follows:

**GENERAL ASSEMBLY (For each Regional Aquaculture Cluster)**

The General Assembly is the supreme governing body of each cluster at the regional level, through which the partners (members) express their collective will on the matters within its scope of authority, it being made up of all the partners and presided over by the Chairman of the Board or, in his absence, the Vice-chairman.

The decisions will always be made by a simple majority, with one vote for each member. In the event of a tie, the Chairman shall cast the deciding vote.

**BOARD OF DIRECTORS (For each Regional Aquaculture Cluster)**

The Board of Directors is the body that meets in ordinary, periodic sessions to monitor the management and representation of the Cluster's formal structure, as well as the body responsible for implementing the decisions made by the Assembly. It is composed of the Chairman and the Vice-chairman, who will replace the President in the exercise of his functions should this prove necessary and duly justified.

**TECHNICAL TEAM (For each Regional Aquaculture Cluster)**

The technical team is made up of a variable number of people, depending upon the resources and needs of each cluster structure (either a Cluster Manager, with several technicians, or only a Manager) dedicated to implementing the actions and/or services that the Cluster includes in its Strategic Plan.

**STEERING COMMITTEE (Common for all regional cluster structures)**

The Steering Committee is the common and supranational body whose function is to represent, coordinate and align the activities that are launched by each regional cluster (Loreto, San Martin and the State of Amazonas). Specifically, its functions are as follows:

- Ensuring coordination between the different formal cluster structures at the regional level (Loreto, San Martin and the State of Amazonas).
- Generating work spaces between the technical teams of the three clusters to identify and launch cross-border actions of common interest.
- Identifying strategic projects whose scope encompasses the entire Amazon basin.
- Serving as a representative body for the Amazon Cluster before supranational entities (for example, multilateral investment agencies).
- Identifying and fostering collaboration amongst the different stakeholders (public and private, producers, knowledge generators and authorities).
## 7.4/ Actions Timeline

The following table presents the timeline for these actions.

<table>
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<tr>
<th>Actions</th>
<th>Calendar</th>
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<tr>
<td></td>
<td>2015</td>
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<tr>
<td><strong>L1</strong> <strong>COOPERATING</strong> to achieve economies of scale, a shared image, and synergies</td>
<td></td>
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<tr>
<td>1. Creating spaces for encounters and knowledge sharing</td>
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<td>2. Reducing instability in relationships and generating new ones</td>
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<td>3. Augmenting the capacity to influence</td>
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<tr>
<td><strong>PROJECT: Improving the value chain</strong></td>
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<tr>
<td><strong>L2</strong> <strong>INNOVATING</strong> to become a leader</td>
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<tr>
<td>4. Expanding education and training</td>
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<tr>
<td>5. Learning about the agents’ technological capabilities</td>
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<tr>
<td>6. Identify, defining and formalising R&amp;D projects</td>
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<tr>
<td>7. Securing funding and presenting projects</td>
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<tr>
<td><strong>PROJECT: Innovation Hub</strong></td>
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<tr>
<td><strong>L3</strong> <strong>GROWING</strong> to achieve critical mass</td>
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<tr>
<td>8. Securing funding and facilitating access to it</td>
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<tr>
<td>9. Broadening the base of members who collaborate on the Cluster</td>
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<tr>
<td>10. Supporting the diversification of activity</td>
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<tr>
<td><strong>L4</strong> <strong>INTERNATIONALISATION</strong> for new horizons</td>
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<tr>
<td>11. Identifying international partners</td>
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<tr>
<td><strong>PROJECT: International demand study</strong></td>
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<tr>
<td>12. Conducting promotional and dissemination work</td>
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<tr>
<td>13. Positioning on international networks and platforms</td>
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<tr>
<td>14. The identification of “international” projects</td>
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</tbody>
</table>
BIBLIOGRAFÍA

- Banco Central de Reservas del Perú, Caracterización del Departamento de Loreto, 2013.
- Banco Central de Reservas del Perú, Caracterización del Departamento de San Martín, 2013.
- Banco Central de Reservas, San Martín: Síntesis de Actividad Económica, Diciembre 2013.
- CONFAP, http://confap.org.br
- CONSECTI, www.consecti.org.br
- DIREPRO, La acuicultura en la Región de Loreto,
- FAO, El Estado Mundial de la Pesca y la Acuicultura, 2012.
- FINCYT, www.fincyt.gob.pe/
- Gobierno Regional de San Martín, Ministerio de la Producción, Marco Estratégico para la acuicultura de la Región de San Martín, 2013.
- Governo do Estado do Acre, Programa de Desenvolvimento da Piscicultura no Estado do Acre.
- IBGE - Instituto Brasileño de Geografía y Estadística
- IBICT, www.ibict.br
- IDSM-Instituto de desarrollo sustentable Marirauá, http://mamiraua.org.br
- IIAP- Instituto de Investigación de la Amazonia Peruana, www.iiap.org.pe/
- INEI – Instituto Nacional de Estadística e Informática de Perú.
- INPA, www.inpa.gov.br
- Proyecto ICI - Creación de capacidades para el desarrollo de la acuicultura del Arapaima gigas y otras especies acuícolas en la región de San Martín-Perú
- Resumo sobre a Rota do Pescado no Alto Solimões – AM, 2014
- UNAP-Universidad Nacional de la Amazonía, www.unapiquitos.edu.pe
- Universidad Federal del Amazonas, www.ufam.edu.br
- Universidad Privada Científica del Perú, www.cientifica.edu.pe
- UNSAM-Universidad Nacional de San Martín, www.unsm.edu.pe
- Universidad Nacional de San Martín, Plan Operativo 2014.
European Commission

EULAC-EUREGIO (CBRIS):
EU-Latin American Cooperation on Cross-Border (BR-PE) Regional Innovation Systems in the framework of the Regional Policy

Luxembourg: Publications Office of the European Union
2016 — 56 pp. — 21 x 29.7 cm

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<td>• via one of the sales agents of the Publications Office of the European Union (<a href="http://publications.europa.eu/others/agents/index_en.htm">http://publications.europa.eu/others/agents/index_en.htm</a>).</td>
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