SIPPO
Swiss Import Promotion Programme

Product Strategy for Camu Camu.

State of affairs, product strategy and interventions for market entry in Europe.
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About SIPPO SIPPO, the Swiss Import Promotion Programme, is a mandate of the State Secretariat for Economic Affairs, SECO, within the framework of its economic development cooperation. It is carried out by Osec, the official Swiss foreign trade promotion agency.

The programme helps SMEs in developing and transition countries to gain access to the Swiss and European markets by providing information, training courses and other matchmaking services. SIPPO also assists importers from Switzerland and the European Union with finding suitable partners and high-quality products from selected developing and transition countries. The programme has five main goals:

- To inform the Swiss and European import economy about new market sources
- To strengthen trade institutions and business sector associations in the trade promotion process
- To increase the competitiveness of SMEs in selected partner countries
- To develop the manufacturing and exporting skills of SMEs in selected partner countries
- To establish qualified trade contacts between SMEs from emerging markets and markets in transition and the Swiss and European import economy

Report Content Within the scope of the project Perubiodiverso, an initiative supported by the State Secretariat for Economic Affairs (SECO) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (german cooperation), in convention with the Ministry of Foreign Trade and Tourism (MINCETUR), the Peru Export and Tourism Promotion Board (Promperu) and the Ministry of the Environment (MINAM), SIPPO is mandated to support Peruvian companies in accessing the European market. In this context, SIPPO compiled product strategies for: Maca (*Lepidium ssp*.), Sacha inchi (*Plukenetia volubilis linneo*), Tara (*Caesalpinia spinosa*), Aguaymanto (*Physalis peruvianna*), Algarrobo (*Prosopis ssp*.), Camu Camu *(Myrciaria dubia)* and Native cacao (*Theobroma cacao*).

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List of abbreviations

API	Active pharmaceutical ingredient
APOs	Asociaciones de Productores Organizados
CIP	International Potato Center, Lima, Peru
DIGESA	Dirección General de Salud Ambiental, Peru
EOI	Expression of Interest
EU	European Union
FAO	Food and Agriculture Organization
FLO	Fairtrade Labelling Organization
GACP	Good Agricultural and Collection Practice
GHS	Globally Harmonized System
GIB	Biotrade Research Group (Grupo de investigación en Biocomercio – GIB)
GIZ	Gesellschaft für Internationale Zusammenarbeit, Eschborn, Germany
GMP	Good Manufacturing Practice
HACCP	Hazard Analysis and Critical Control Points., See Codex Alimentarius and ISO 22000
HR	Human Resources
IIAP	Peruvian Amazon Research Institute (Instituto de Investigaciones de la Amazonía Peruana, Iquitos), Loreto, Peru
INRENA	Instituto Nacional de Recursos Naturales, Peru
LDL	Low Density Lipoproteins
INDECOPI	National Institute for the Defense of Competition and Protection of Intellectual Property, Peru
IPPN	Instituto Peruano de Productos Naturales (Business association, Lima, Peru)
IU	International Unit, measures biological activity in pharmacology
R&D	Research and Development
MRL	Maximum Residue Level
MSDS	Material Safety Data Sheet
PBD	Perúbiodiverso (Phase I, Phase II)
R&D	Research and Development
REACH	Chemical legislation in European Union (Registration, Evaluation, Authorization and Restriction of Chemicals); European Community Regulation: Regulation (EC) No 1907/2006
SECO	Staatssekretariat für Wirtschaft SECO in Bern, Switzerland
SIPPO	Swiss Import Promotion Programme (under Osec)
SOP	Standard Operating Procedures
SMEs	Small and Medium-size Enterprises
SNV	SNV Netherlands Development Organization
SWOT	Analysis of Strength, Weaknesses, Opportunities and Strength
TDS	Technical Data Sheet
UN	United Nations
USP	Unique Selling Proposition
WHO	World Health Organization
WIN	Work Instructions

1. Product relevance.

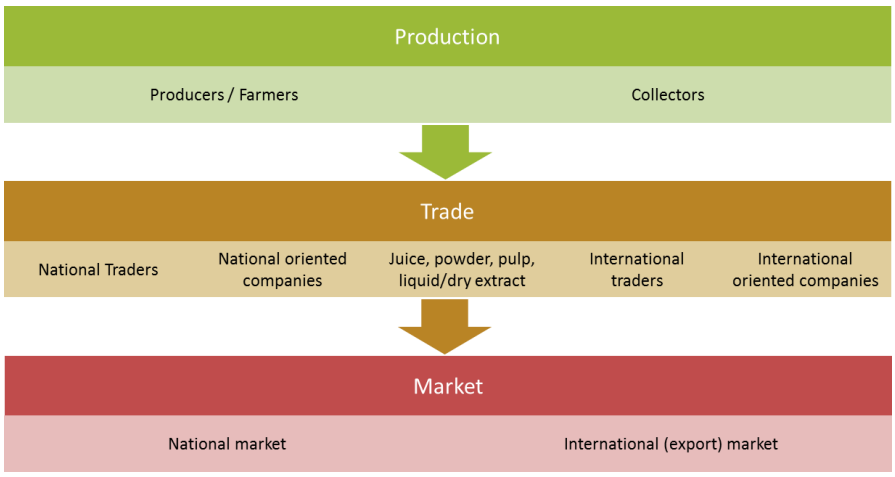
Camu camu is an important part of the ecosystem and the incredible biodiversity in the Amazonian region. The perennial bushy tree grows mainly in swampy and flooded areas of the Amazon rainforest. Moreover, camu camu is an endemic species, meaning it is a native plant species that is exclusive to the Amazonian regions of Colombia, Ecuador, Peru and Brazil.

Camu camu, also known as rumberry or under the botanical name **Myrciaria dubia** belongs to the family of **Myrtaceae**. Camu camu appears in a wide genetic range, but its highest diversity is found in the Peruvian Amazon rainforest. About 65 species of Myrciaria exist in Latin America among which the best known is Myrciaria dubia H.B.K. McVaugh (Dostert 2009), or common camu camu.

Camu camu bears orange/red coloured fruits in the size of cherries or even lemons, which contain an outstanding amount of Vitamin C. This fruit has potential for national and international trade and can become an important source of income for the rural population of this region.

Ethnobotanist Mark Plotkin notes in his book Tales of a Shaman's Apprentice, that "a forest stand of camu camu is worth twice the amount to be gained from cutting down the forest and replacing it with cattle," and he believes that camu camu cultivation holds real economic promise for local economies. Usually, camu camu fruit is wild-harvested in the rainforest in canoes because the fruits mature in the high water or flooding seasons in the Amazon.

Figure 1. Sector map of Camu Camu.



2. Product status.

Introduction to the market
Camu camu is mainly used as a commercial product in the food, pharmaceutical and cosmetic sector. Camu camu is largely pre-processed as pulp, powder or extract in Peru. Further processing is done in the certain importing country.

In the food sector the pulp is processed and used as additive for juices, drinks, yoghurt or jam. Due to the very high Vitamin C content, camu camu is also used as dietary supplement in form of capsules, as active principle for the pharmaceutical sector. However, camu camu falls in the Novel Food Regulation, which is evaluated in the following subchapter.
In the cosmetic sector camu camu can be found in shampoos and skin care products. The main producers of skin care products are Japanese companies, whereas French and Brazilian companies produce shampoo.

Japan is one the major purchasers (1.600 tonnes between 2006 and 2011) of camu camu, and is followed by the Netherlands (372 tonnes), the United States (82 tonnes) and Canada (8.6 tonnes). Obviously the European countries have yet not recognized the potential of camu camu. Although, promoting camu camu as the new “superfruit” offers and opens new markets in the near future.
Camu camu is mainly exported as pulp, powder and juice (depending on the application) to the mentioned countries.

Concerning organic camu camu, the United States are by far its main purchasers. France and Australia and the United Kingdom together account for one-fifth of the total for the United States markets. However, organic juice is not exported, but pulp, powder and extracts.

Although the market is of small scale European demand for camu camu is stable and with high quality standards and value adding certification, such as organic and fair-trade, the fruits are expected to face good opportunities on the market.

However, the main obstacle - further than the Novel Food barrier - is the inconsistency of available camu camu quantities and quality each year. Also detailed documentation and analysis of active principles is mostly missing. This leads to insecure trade conditions as purchasers and prices.

The annex provides more information on trade figures and characteristics of camu camu.

Constraints and opportunities
Constraints are determined by the production and regulatory environments, funds, business acumen, labour rights and ethics and market opportunities. The history of price setting in Peru is mainly determined by buyers and not based on cost calculation. This has led to loss of interest for sustainable procurement of raw materials.

The following SWOT analysis (Table 1) articulates specifically the core needs for export marketing and market entry in Europe. At the same time the analysis is pointing to specific bottlenecks in product documentation and implementation of market access requirements based on national and international legislation.

Table 1.SWOT Analysis (Biotrade 2005, reviewed by K. Duerbeck 2011).

Strengths	Weaknesses
• Peru is recognized worldwide as a major supplying country. • Active sector association (IPPN). • Appropriate legislation governing conservation and sustainable use. • Native communities have ancestral knowledge about the utilization of plants. • High acceptability by population of natural ingredients. • Wild collection, domestication & cultivation.	• Apparent insufficient supply of seed. • Wild collection not sustainable. • Lack of standardized scientific information. • Lack of company and product information. • Lack of a comprehensive research on the production, use and validation. • Difficulties in domestication leading to insufficient and heterogeneous national agricultural production. • Few specialized and accredited laboratories of chemical analysis. • Missing product data for Novel Food. • Camu camu market in EU only as food supplements (other food uses have to be authorised pursuant to Novel Food Regulation) • Inactive Camu camu Technical Board of Loreto.
Opportunities	**Threats**
• Widespread worldwide trend towards innovative natural ingredients. • Application for food, cosmetics and health. • Sector and company strategies for sustainable production and marketing. • Institutional support to companies. • International cooperation for toxicological studies for application in food, cosmetics. • Income generation for rural areas for the increase of sustainable production. • Sustainable resource management.	• Growing competition from other countries, e.g. Ecuador, Colombia, and Brazil. • The presence of opportunistic exporters. • The presence of product adulteration. • Loss of markets for not complying with the international quality standards and buyer requirements like hygiene and quality. • Missing data for consumer safety • Unclear status regarding Novel Food. • Service providers for companies not established

Even though camu camu has convincing qualities due to the extraordinary high Vitamin C content, missing information about traditional use as well as information about toxicant and safety is not available. Moreover, the wild collection of camu camu does not provide consistency in rural income generation, neither in quantity nor in quality.
Thus, with every extinguished root problem, as mentioned, opportunities and strength of camu camu will lead to increasing potential on the international market.

Additionally, due to the newfound interest in tropical “Superfruits” and alternative medicines camu camu is slowly gaining, which creates a new opportunity.
As a further opportunity, agroforestry with camu camu has become an alternative form of floodplain agriculture, returning tree cultivation to intensively cropped lands. These changes in the biophysical environment have beneficial impacts on the diversity and habitat in this region.

The following constraints (see table 2) and the opportunities emerging need to be acknowledged before considering opportunities and pathways to improve responses to environmental and natural resource issues.

Table 2. Constraints, opportunities and objectives.

Constraints	Opportunities	Objectives
Resource management and control mechanisms	Resource assessment, Resource management, Domestication and cultivation: Best practices	Strengthen natural resource management for wild collection, domestication, and cultivation
Enabling environment Socio-economic	Product quality/description Market information Access to markets	Organize access to product/market information Increase transparency in chain
Enabling environment Policy	Access rights/land tenure policy, Policy Framework conditions Access to credits, subsidies	Support stakeholder involvement and representation; market control and facilitation
Enabling environment Institutional	HR development/management Access to rural extension	Capacity development in management skills
Enabling environment Production and processing	Access to information and applied R & D	Facilitate access to communication and services

The most important objective is the evaluation of the Novel Food status for camu camu and its ingredients. Once the need for the Novel Food application it is established preparations for Novel Food Application have the following requirements, costs and timelines:

Table 3. Requirements, costs and timelines for Novel Food Applications.

Requirements	Costs	Timelines
Toxicological tests:		
Minimum requirements	- 100.000€	9 months
Full box package	- 1.2 million €	24 – 36 months
Pre-assessment meeting	6.000 – 9.000 € + 5.000€	3 months
Compilation of dossier	30.000 – 50.000€	3 months
Initial evaluation of national authority	0 – 25.000€	6 – 12 months, even longer
Final opinion by The EU Commission		6 – 36 months
Total	136.000 – 1.3 Mio. €	27 – 90 months

Source: Armbruster, a&r (2011), modified by K. Duerbeck 2011

Additional consultant costs may arise once additional data have to be presented in front of national authority and/or EU Commission.

Moreover, since camu camu has to compete with various other Vitamin C in different market segments, options for value addition are reaching out for certification, such as Biotrade Principles and Criteria, organic and/or fairtrade. Certifications as avalue adding tool are improving the competitive situation on the market. Besides, the demand for certified products with a 'history' is increasing significantly.

Risks and constraints

Articulating supply, process, demand, and control risks the above mentioned weaknesses and threats constitute constraints and need to be acknowledged before considering opportunities and pathways to improve responses to environmental and resource issues. The greater uncertainties in supply and demand, globalization of market, complex international supply network relationships resulted in higher exposure to risks in the supply chain, including chaos and decision risks. The risks in production include:

- Difficulties in assurance of raw material;
- Quality of raw material;
- Supply chain risk management process;
- Vulnerability (logistics, extent, elements at risk and why, people and their locations at risk);
- Degree of resilience in natural resource management and logistics;
- Lack of supply chain confidence;
- Lack of visibility;
- Lack of supply chain control.

Producers also face difficulties in approaching international market due to missing R&D and product documentation.

Specific risks emerge from the non-existing Novel Food application which makes the data production for decision making whether or not to apply for Novel Food registration.

Trade barriers

The requirements and specifications for the products and the company internal control systems in Europe are increasing constantly for the implementation of UN guidelines, including ISO Standards.

In the EU camu camu is in the Novel Food catalogue under the FS status to be used in food supplements. According to information available to Member States competent authorities this product was used only as or in food supplements before 15 May 1997. Any other food uses of this product have to be authorised pursuant to the Novel Food Regulation.

In Switzerland camu camu organic fruit pulp is imported since 2007. As extract it is has an established use in consumer products as food supplement and promoted for its high Vitamin C content. Preference is given to products with organic (and fairtrade) certification.

Exporting companies have no other option than to comply with regulations based on international guidelines provided by different UN-Organisations (WHO, Codex Alimentarius of WHO/FAO). An alternative option is to look for new markets which might be easier to penetrate for the time being outside Europe.

3. Product strategy.

The aim of the SIPPO product strategies is to achieve consistency of what Perubiodiverso II (PBD II) does with SIPPO's indicators: At the same time the objective is to develop a common platform for any other potential partners that SIPPO may work with so that they can develop separate interventions and still be consistent with this strategy.

Such a strategy may appeal to SECO and enable them to use this as a consolidated document per product selected. The bulk of data and analysis comes from the sub-sector analysis done by Biocomercio & Perubiodiverso in recent years.

The product strategies of products preselected by PBD II are meant to revisit the earlier recommendations in the context market entry in Europe using the following filters:

- market access,
- achievable target for March 2013, and
- work planning for 2013 and beyond.

On the basis of the SWOT analysis short-term and long-term strategies are identified to potentiate the true strengths and to neutralize the weaknesses, which are important disadvantages.

The short-term strategies should concentrate efforts of camu camu using the ancestral knowledge of the native communities, which constitutes an innovation source of new products. This should be accompanied by local and foreign investment with the purpose to implement sustainable wild collection, domestication and cultivation in Peru. This strategy should contemplate the rapid correction of the weaknesses about positioning products which are dietary supplements under the concept of "functional food".

Increasing the national consumption by establishing an efficient communications system is needed for each one of the actors of the productive chain. Doing intensive external promotion campaign to achieve an increase of global demand is important to justify the investment in product development and registration. These measures should also use the opportunities offering natural ingredients in line with the international regulation. (UNIDO 2006)
For long-term strategies the strengthening of the value chain can eliminate the structural weaknesses, which limit significantly the competitiveness. The principle weaknesses to be considered are limited research at national/international levels about resource management and use, claim validation, land properties and local culture, fiscal and sanitary requirements.

Given the constraints that are mentioned so far SIPPO sees four core elements of the product strategy to achieve this target:

- An increase in the collection and production of uniform camu camu raw material
- An increase in the value addition of exportable products by:
  - An increase in the % of products that are accompanied with appropriate verification and/or certifications
  - Moving up the value chain to extraction
- A reduction in the cost of production, also benchmarking wild collection against cultivation
- Developing a promotional strategy that supports these initiatives through:
  - Creating greater awareness, in products and strategic markets, and of the value proposition.

As seen from the above section, the industry is too new as extract industry in Peru and too small to compete with any economy of scale even when it expands to its full potential. Hence, the option for Peru is to utilise a focused strategy whether in terms of cost or differentiation. It seems that the Peru Government, the IPPN sector association and the Technical Board of Loreto are focusing on moving the industry towards the specialty (differentiation) route.

More companies operating in Peru are moving towards organic or are already organic certified. According to PromPeru, the share of organic camu camu exports increased from 4.5% to 22.6%, in the years 2009 to 2010.

At the same time and in the context with a fairtrade certificate the companies consider the costing and pricing or at least explain why they need the prices they are asking for in the international market. Special efforts are made to introduce the Vitamin C rich extract in the markets as verified according to Ethical Union of Biotrade Standard (wild collection and cultivation) and/or certified according to the FairWild Standard (wild collection only) for the implementation of Biotrade Principles and Criteria.

4. SIPPO Focus.

Guiding criteria

In this section it is explained where in the value chain SIPPO will focus its attention in order to make the maximum possible impact on the competitiveness and export orientation of the sector. As it stands SIPPO and its national expert play a pivotal role in trust building in Peru. The technical assistance through the SIPPO expert is for trust building and showing SIPPO competence and the promotion of guiding criteria to have the greatest impact on SIPPO's indicators.

The following three questions are examining the SIPPO guiding criteria:

- Is the desired change feasible for the selected target group?
- Can the project output be delivered in a sustainable way?
- Can this be done in the time frame and with the resources the project has?

It is from this rationale/logic that SIPPO establishes plausible attribution to what is going on in the sector – the SIPPO national expert will therefore focus on local governance, environmental education and awareness through institutional strengthening with and among resource owners and users.

Table 4. Assessment of market based solutions.

Type Value Chain Constraint/Opportunity	Identified potential market-based and commercially viable solutions
Product Development and Registration	• Organize training courses for personnel of companies in national quality standards, export requirements of niche markets. • Promote the science based product documentation
Service Providers	• Assisting sector service providers, such as consultancies, research institutions to improve service capacities • Support promotion of authentic ingredients and final products
Organization and Management	• Encourage companies to introduce business plans and management plans and to implement good practices • Organize trainings for producers that will cover issues of data collection for resource assessment & management planning
Regulatory (Policy)	• Support national legislation development in accordance with UN guidelines and to enable its appliance on company level • Generally improving the business enabling environment
Finance	• Micro-finance schemes for collectors, farmers and companies • Identification of service providers for access to finance
Input Supply	• Support conservation of traditional knowledge and practices • Promote the science based domestication and cultivation • Promotion Best Practices in resource management
Infrastructure/Human Resources	• Collectors & farmers training in sustainable procurement • Value addition and logistics
Business Membership organisation	• Maintenance of permanent dialogue and cooperation among all stakeholders in the value chain as services to members • Strengthening the competent sector representation on a national, regional and international level

As a result of the assessment of market based solutions, the following should be identified:

a) Existing service providers. i.e. consulting firms, institutes.
b) Existing and potential users, including collectors, farmers, and companies.
c) Constraints to provision (by service provider type).
d) Potential providers of sustainable market based solutions.
e) Commercial feasibility of market based solutions (by service provider type).

To summarize the selection of market-based solutions through a priority listing for the two major targets: Potential increase value chain growth and competitiveness and number of SMEs in the target group that will benefit directly and indirectly (outreach).

Supply and strategy

The main areas of improvement required among Peruvian supplier companies were described earlier in the strategy, as follows:

- Upgrade from wild collection to forestry and agriculture practices
- Technological development for technical value addition
- Developing a better working and business environment
- Further development and implementation of legal framework
- Sector marketing.

Visibility and control can be achieved by documentation, transparency and open pro-active communication throughout the supply chain. Ultimately, such transparency will be visible in the consumer market. Established with a label or a verification framework, it will increase trust in the whole supply chain. In the long term, fair-trade certification and Biotrade verification/certification for these products applied in sourcing the products will contribute to addressing these risks.

Partners

The core partners in the implementation of the project's interventions are:

- Intervention: Increase of raw material procurement through sustainable wild collection and domestication based on national and international legislation and guidelines. For this intervention, the main partner is IIAP with offices in Iquitos, Pucallpa and Tarapoto, and currently one of the leaders of the (presently inactive) Camu camu Technical Board of Loreto (see homepage with publications on camu camu resource management). With this intervention, PDB's role will therefore turn to facilitation and linkage between service providers on the one side, and companies on the other.
- Intervention: Product documentation – Partners are GIB (the PBD Biotrade Research Group), and IIAP, which gathers product information from research projects and export- oriented companies, and provides support to the IPPN Association, and to companies to facilitate market entry.
- Other interventions: PBD will work on identifying other partners depending on the type of intervention, as for example regarding identifying national legislation partners among representatives of respective ministries.

5. Interventions.

The interventions considered in the context of this product study are primarily part of component II in Perúbiodiverso II. Component I will be included once the company and product documentation are available.

Ongoing interventions.
Identification of new companies: The purpose of identifying service providers and manufacturing companies is to increase the impact of the interventions to as many companies as possible. All good export-ready companies in Peru can profit from market access strategies.

Collaboration with sector associations, i.e., Camu camu Technical Board of Loreto at IIAP, IPPN, and PromPeru: The trade associations so far have always had difficulties because they were not able to build up trust and to get enough funding for their activities.

The Ministry of Agriculture and the Ministry of Foreign Trade and Industry have expressed their interest in supporting this sector and to include them in their rural development strategy provided they get organized. At the same time, Regional Governments are prioritizing the agricultural sector in their development plans. Subsidies and financial support are available under a special budget line for applications from clusters or associations.

Collaboration with INDECOPI: Four Peruvian Standards on Camu camu are already published including NTP 011.030:2007, NTP 011.031:2007, NTP 011.032:2009 and NTP 011.033:2010.

Types of interventions needed
The overall objective of this SIPPO Project PBD II is to enhance the export competitiveness of companies and thereby help to alleviate poverty. In order to measure these objectives, similar indicators should be used as for other SIPPO activities, namely increased sales or exports, revenues, employment, as well as more diversified markets, products and services, together with a larger number of participants at promotional events.

Sequencing of SIPPO interventions
After mapping the productive environment, human resources and miscellaneous basic infrastructure needs, and determining the categories of interventions, the context and the sequencing of activities, it will be required to identify access opportunities, available service providers, and leading firms. After the first intervention the number and expertise of the leading firms is expected to unfold and develop. The leading firms and the service providers may vary for the different interventions and their sequencing. Consistent with the temporary nature of the interventions, a clear exit strategy is needed and must be defined from the beginning.
Consistent with their temporary nature, the interventions need to define a clear exit strategy from the beginning.

Ranking and prioritization of issues.
Taking into account the results and lessons learned of PBD and the findings of the GAP analysis, the following priorities were established for potential market-based and commercially-viable solutions:

1. Increase raw material production based on strict cost calculation
2. Access to market, including product documentation
3. Assisting service providers
4. Organizing training courses
5. Creating an enabling environment (national and international)
6. Encourage business planning.

The expert's recommendations are based on the available background information and our own experience working with companies and institutions in Peru. Resource management together with company-specific product documentation are both high priorities as they provide the basis for implementing market development and access to markets.

Table 5. Priority matrix.

Interventions	Aim	Actor	Time	Lead by
		Producer performance		
Identification of R&D inputs, & exit strategy	Agricultural production, product development, claim substantiation for botany, chemistry, use	National research institutions, universities	April 2011 – March 2013	PBD
Elaboration of product parameters	MRL, HACCP, Codex Alimentarius requirements, audit, & certification/verification	National research institutions, universities, service providers	April 2011 – March 2013	PBD
Product documentation	TDS, MSDS, Novel Food, REACH, GACP, GMP	Companies, national service providers	June 2011 – June 2012	PBD
Resource management	Sustainable resource management and raw material procurement, including financial resources	Companies, national service providers	June 2011 – March 2013	PBD
		Market development		
Access to market	Market entry in Switzerland, and based on the regulatory status and requirements in EU	Companies, national service providers, PromPeru, SIPPO	May 2011 – March 2013	SIPPO

The detailed portfolio of PBD II services is available from the Estrategia del Proyecto Perúbiodiverso para Empresas y Asociaciones de Productores Organizados (APOs) as the implementation pathway at company/APO level.

Intervention pipeline

First Intervention: Resource management

The scaling up of raw material production has been identified as one of the main constraints at company level. Specifically bottlenecks were apparent in the identification of suitable areas for agricultural production and the build-up of agricultural extension services in identified areas determined by geographical studies (Chauca 2009), and resource management plans for wild collection (Sanchez 2006) and cultivation based on INDECOPI standard NTP 011.032:2009.

Table 6. Impact logic and indicators for impact logic for resource management.

Impact Logic		Indicators of Impact Logic
Activity	Identification	Potential growing regions, companies interested in supply chain and their requirements, products and parameters
Output	Documentation	Documentation of potential regions and the respective soil and climatic characteristics, potential supply chain partners, potential service providers, collectors/farmers interested Marketing strategy
Use of output	Contacts Offers	Appropriate areas identified for wild collection/cultivation Costing and pricing at different supply chain levels Supply chain partners identified
Outcome	Contracts, orders	Opportunities for value addition (certification, extraction) Development of product standards based on Codex Alimentarius guidelines Regional marketing activities Decentralized processing
Impact	Sales	Extension service available Increased rural incomes
Aggregated impact	Increase of employment	Increased employment

The Results Chain for this intervention with indicators at each level is as follows:

Table 7. Indicators and measurements used.

Indicators	Measurement used
New areas for wild collection/cultivation	Description of climatic and soil properties & participative cost calculation Evaluation and transparency for alternative option for farmers' income
Diversification of products and documentation	New products identified Specifications (TDS, MSDS) Manuals for cultivation, post-harvest, price calculation and logistics
Interest of companies	Promotion of supply chain and options for value addition
Preparation of companies	New products identified and developed Complete documentation Audits and certifications
Marketing strategy	Management documents Information for dissemination through brochures, posters, website Marketing support for companies as Peruvian biodiversity product

An intervention to ensure sustainable procurement in the context of sustainable resource management of raw material needs to be executed by components 2 and 3 of PBD II.

Second Intervention: Access to market

Product documentation has been identified as one of the main constraints for companies. Typically product documentation has not been identified as a main constraint for national, regional and international market access of camu camu products. Together with PromPeru, the sector's association IPPN, INDECOPI and DIGESA must develop product standards for camu camu. Safety Data Sheets are required for camu camu extracts following GHS guidelines.

Table 8. Impact logic and indicators for impact logic for access to market.

Impact Logic		Indicators of Impact Logic
Activity	Identification of market access requirements	National and international product parameters Sustainable sourcing
Output	Documentation and export marketing strategy	Documentation (companies and products, e.g. brochures, business contact sheets) Marketing strategy
Use of output	Contacts	Market research and intelligence Contact management, marketing activities
Outcome	Offers	Pre-fair: company/product documentation, tools for fair Fair presentation format, booth, HR, documentation, EoI Post-fair: contacts, EoI, trail orders, contracts
Impact	Contracts, orders	Increased turnover
Aggregated impact	Sales	Increased employment

The Results Chain for this intervention with indicators at each level is as follows:

Table 9. Indicators and measurements used.

Indicators	Measurement used
Preparation of companies	Complete documentation; samples preparation ; booth arrangements; marketing strategy
Documentation	TDS, MSDS, price calculation, business contact sheets
Marketing strategy	Brochures, posters, website, language, company visualisation
Market research	Number of new ideas gained and quality/ technology/ marketing improved
Contacts	Number of contacts established
Orders and contracts	Number of contracts signed and orders made
Increased sales and turn-over	Percent business growth
Increase of employment	Number of new workers hired after intervention

As a result of the first two interventions in the context of PBD II, a number of raw ideas will be tested and developed into valid ideas for new interventions. Sourcing and funding can be made available for new interventions from national interest groups, service providers or national government and donors.

A target group for each intervention is specified consisting of leading firms and the respective sourcing framework, and companies with interest in diversifying their present portfolio, as a result of outreach efforts.

For different products categories of camu camu the following lead firms were identified:

a. value addition through (organic/fair-trade) certification:
- Ecoandino, Inversiones 2A, Algarrobos Organicos, all based in Lima

b. extraction of active principles
- Zana, Lima, dry extract
- Liofilizadora del Pacifico, Lima, freeze dried extract
- Peruvian Nature, Lima, dry extract.

The leading firms are considered the main pillars of the PBD II in Peru blazing the trail for other sector companies within their business associations and in connection with national service providers in a more enabling business environment.

What is missing in the country portfolio of products from camu camu is the processing of freeze dried fruits. These should be an innovative starting product and ingredient for national health food markets. International demand for this product is already encouraging the development of new products that meet consumer preferences.

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7. Annex.

Camu camu - production and use
Camu camu is a precious, endemic native plant species from the Amazon region in Peru and Brazil.

Camu camu, also known as rumberry or by its botanical name **Myrciaria dubia** belongs to the **Myrtaceae** family. It grows up to three meters high as a bushy riverside tree mainly in the wild in the Amazon rainforest, in swampy and flooded areas. Camu camu bears orange-red coloured fruits in the size of cherries or even lemons, which contain an outstanding amount of Vitamin C.

Table 10: Nutritional Value of Camu camu.

Components	Average Content (for each 100g of edible part)
Water	94.4 g
Energetic Value	17.0 cal
Proteins	0.5 g
Carbohydrates	4.7 g
Fiber	0.6 g
Ash	0.2 g
Calcium	27.0 mg
Phosphorus	17.0 mg
Iron	0.5 mg
Thiamin	0.01 mg
Riboflavin	0.04 mg
Niacin	0.062 mg
Reduced Ascorbic Acid	2780.0 mg
Total Ascorbic Acid	2994.2 mg

Source: Biotrade programme. Promperu 2008

Camu camu is mostly collected in the wild. However, recently camu camu is increasingly becoming a cultivated fruit tree across the Peruvian Amazon floodplain. The nutritious fruit is sold as one of a multitude of non-timber forest products (NTFPs) extracted from the wild. Cultivation of camu camu started in the mid 1990s when government-funded reforestation projects were implemented for the export of camu camu to Japan. Additionally, it was promoted as flood-resistant, highly productive tree crop for agroforestry projects that could contribute in improving rural incomes and standards of living.

Until the 1960s the sour and bitter fruit camu camu was not extensively used as a food product, but as a traditional fishing lure and as firewood.

Today camu camu is mainly used as a commercial product in the food, pharmaceutical and cosmetic sectors. In the food sector the pulp is processed and used as an additive for juices, drinks, yoghurt or jams. Due to its very high Vitamin C content, camu camu is also used as a dietary supplement in capsules, pills or powder.

In the cosmetic sector, camu camu can be found in hair and skin care products. The main producers of skin care products are Japanese companies, with French and Brazilian companies focusing on hair care. To a low extent the seeds of camu camu are processed to vegetable oil or tea.

Camu camu's health benefits are derived from its content of nutrients such as calcium, Vitamin C, flavonols, particularly quercetin and ellagic acid, niacin B3, riboflavin B2, phosphorous, iron and amino acids, such as leucine, serine and valine.

Of special interest is the high concentration of Vitamin C with quercetin and ellagic acid, that is more than 50 times the content of Vitamin C found in oranges. The high content of Vitamin C makes camu camu a powerful prevention tool for different kinds of illnesses. Other benefits are:

- mood balance
- stronger immune system
- improved adrenalin function
- improved blood pressure
- heart and brain nutrition, and
- powerful antioxidizing properties

According to the Linus Pauling, from the Oregon State University Institute, explains antioxidants with a very high Vitamin C contents protect against viruses and, moreover, repair and support tissue growth. Additionally, in a study published in the Journal of Cardiology in 2009, Japanese researchers presented camu camu as a multiple heart protective, anti-inflammatory and antioxidant agent with more powerful properties than synthetic ascorbic acid (Vitamin C) alone.

Camu-camu has never been documented as a traditional herbal remedy for any application in the Amazon region. In fact, it was not widely eaten as a fruit by the indigenous people, due to its sour, acidic taste. In recent years, the fruits have become popular in Peru where they are made into drinks and ice creams. Moreover, camu camu is slowly gaining popularity due to the newfound interest in tropical "Superfruits" and alternative medicines.

The Superfruit

"Superfruits" have gained popularity in recent years. They combine exceptional nutrient properties, and antioxidant quality with an appealing taste. Moreover, superfruits possess particular potential as functional foods, and as ingredients for cosmetics and pharmaceuticals. Among berries, goji, cranberry and blueberry for instance have presumably achieved superfruit status.

As the new superfruit from the Amazonian rainforest of Peru, the camu camu berry is the number 1 source of Vitamin C, with 3% pure Vitamin C by weight.

The six ingredients of a superfruit's success are the following:

1. Sensory appeal

When marketing whole fresh fruits as potential superfruits to consumers, their sensory qualities –appearance, aroma, texture and taste – are very important.

2. Novelty

The idea of novelty – or its "newness to the consumer" - can have multiple interpretations. Novelty may be interpreted as:
- new fruit
- new colours, tastes, aroma
- new ways of consuming.

Novelty is one point of difference, but by itself it will create no sustainable value unless the strategy is designed to encompass the requirements of all the six elements.

3. Convenience

In some markets fresh berries are experiencing 20% to 30% annual sales growth – due to their high convenience, in addition to their strong health image.

These small fruits need no peeling and are easy to eat. If other fruits can achieve the same level of convenience then they also might enjoy more popularity with time-starved but health-conscious consumers.

There is a wealth of benefits for everyone in the supply chain by focusing on processed fruit rather than fresh. Growth in superfruits and the real added value will always be overwhelming in juices.

4. Control of supply

One important way to maintain a point of difference is to retain control over the supply of the fruits.

5. Health benefit

The primary purpose of science in relation to creating and marketing a superfruit is to generate health-benefit substantiation so that the company can make convincing claims. This is the key to developing a trustworthy and sustainable health position in the mind of the consumer. There is a positive relationship between the number of scientific studies that have been published about a fruit's health benefits and its superfruit status.

Cranberry, blueberry and pomegranate all have a large number of studies behind them, particularly in proportion to the percentage of the world's fresh fruit production they account for.

6. Marketing

No matter how strong the basis for the benefit, the science will be of no value, unless the marketing strategy is able to communicate the benefit in a credible way to an appropriate target group of consumers. The centrality to success of effective market positioning and marketing communications can be seen persistently on the superfruit market.

Global berries market

An overview of the berries market is a good source of references when it comes to featuring the best opportunities for camu camu. This market is versatile, since it involves not only fresh soft fruits, but also dried products, extracts, juices and beverages, oils and other highly specialized ingredients. Along with the growing trends of convenience, naturalness and intrinsic health, the role of berries is increasingly important and a major source of widespread growth.

The most striking feature of the berry market is its polarization between fresh berries and processed berries. Their value creation chains and market rules are quite different and at times, it seems that the companies work in quite different industries even though they are working with the same raw materials. Fresh berry companies are more one-dimensional and focus on serving the retail industry with fresh products. They concentrate on better consistency, improved flavour and year-round availability of berries. These companies are typically large-scale, operate internationally and source berries from all over the world during the best local berry season. Companies working with processed berries vary depending on their line of business. Their customers may be food processors, and dietary supplement, cosmetic and/or ingredient manufacturers. They may have developed different strategies for their berries: beverage strategies, ingredient strategies, etc.

Another major emerging challenge for the berry industry is the issue of environmental impact. Production-wise, irrigation and pesticides, and transport and logistics are the major burdens. Packaging is a central environmental concern. In particular, retail is demanding less use of packaging. Major producers are looking at new schemes to reduce the cost and impact of logistics from field to supermarket, improve shelf-life of products, optimize packaging process and increasingly use recyclable or biodegradable materials and also enforce strict hygienic standards for fruits and vegetables.

Trade

As mentioned before Japan is one of the major buyers of camu camu. This fact is also presented in the table below. Japan is followed by the United States, Canada, Guatemala and Hong Kong. Obviously the European countries have yet not recognized the potential of camu camu. Although, promoting camu camu as the new superfruit offers and opens new markets in the near future. Camu camu is mainly exported as pulp, juice and powder to the mentioned countries.

Table 11. Camu camu exports to various countries in 2006, 2010 and total.

	Camu Camu					
Countries	**2006**		**2010**		**Total 2006-2011***	
Exports from Peru to	FOB value US$	Net weight Kg	FOB value US$	Net weight Kg	FOB value US$	Net weight Kg
Guatemala	9,120	1,446			10,320	1,466
Italy	882	15	3,860	103	7,442	166
Portugal					3,828	84
Chile	6	2	2,424	332	2,506	411
Japan	1,626,881	268,057	111,815	29,662	6,731,124	1,578,252
Spain	142	12	366	28	508	40
France	10	10	19,003	521	41,023	971
Germany	1,004	68	3,939	98	12,062	333
Austria	2,100	50			3,800	75
Canada	21,785	394	97,277	2,501	296,760	8,617
United States	254,155	12,638	254,481	30,391	1,337,372	81,611
Hong Kong	23,085	400			65,785	1,010
United Kingdom	7,315	482	41,403	680	110,055	2,566
Switzerland	4,595	79	990	20	9,713	183
Australia			31,000	500	74,418	1,210
Czech Republic			3,010	453	4,839	502
The Netherlands	87,636	32,498	4,050	75	1,432,453	372,732
Taiwan	1,599	540			1,604	540
Total	2,040,315	316,691	573,618	65,364	10,145,612	2,050,769

Source: PromPeru, *Data 2011: to April

Amounts for organic camu camu differ significantly. The United States are the main purchasers of organic camu camu although that accounts only for 4% of total organic camu camu imports into the United States. France and Australia and the United Kingdom together account for one-fifth of the United States's imports. Organic camu camu juice is not exported, but only pulp, powder and extracts.

Table 12. Total organic camu camu exports from 2006 to 2011.

ORGANIC Camu Camu	Total 2006-2011*	
Exports to	FOB value US$	Net weight Kg
South Africa	10,620	180
Portugal	2,740	50
United States	130,337	5,153
Germany	807	14
France	34,500	690
Australia	24,000	400
Canada	0	0
The Netherlands	4,050	75
Poland	1,180	20
United Kingdom	16,481	275
Sweden	1,550	25
Japan	2	5
Total	226,267	6,888

Source: PromPeru, *Data 2011: to April

Trends and perspective

The spread of cultivation of camu camu in Peru was initiated through a top-down, rapidly imposed government programme. The success of the programme is largely attributable to local experienced flood-plain farmers, who contributed local agricultural practices to the governmental notes to make it work. Agroforestry with camu camu has become an alternative form of floodplain agriculture, returning tree cultivation to intensively cropped lands. These changes in the biophysical environment had beneficial impacts on the diversity and habitat in this region.

About 95% of Peruvian camu camu production is intended for export, mostly without significant processing owing to still deficient technology. As a consequence, a high fraction of the value chain is realized outside of Peru.

To capture the main bulk of the value chain the following issues need to be developed:
Construction and development of the social (capacity, know how, cooperation) and technical (communication, transport, etc.) infrastructure. Further, building plantations is necessary to avoid inconsistency due to environmental risk, and to tap the genetic diversity of camu camu through new breeding techniques. To ensure stable yields, enhanced economic, management and ecological conditions are essential. Finally, the Novel Foods approval opens new doors in Europe for endemic products like camu camu and offers opportunities for Amazon region farmers.

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