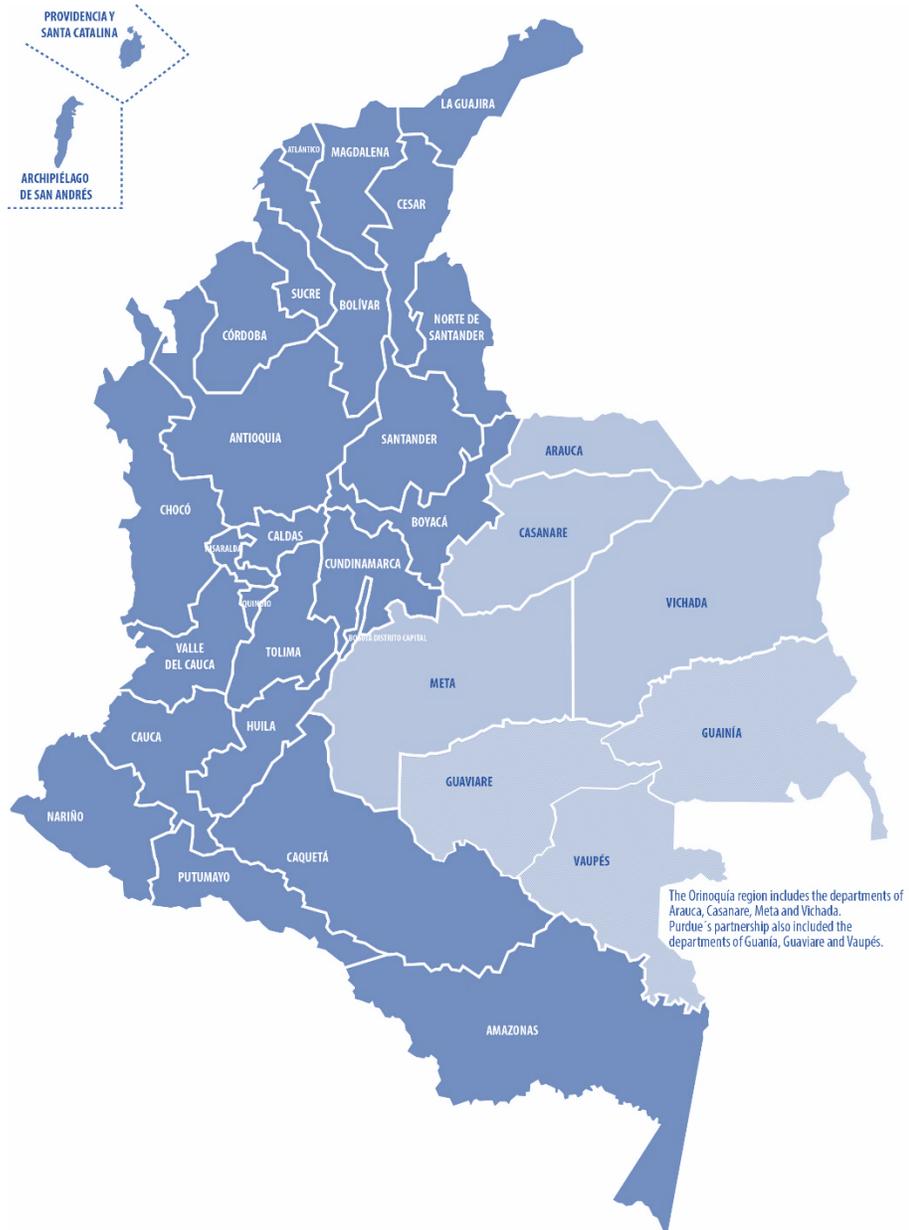


The Orinoquía Initiative



A Science-Driven Approach to Sustainable Development of Colombia's Orinoquía Region.

Our collective vision: an Orinoquía with a prosperous, environmentally sustainable, market-oriented agriculture with ample areas for distinctive ecological and cultural tourism activities.

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SUMMARY

A Science-Driven Approach to Sustainable Development of Colombia's Orinoquía Region.

Our collective vision: an Orinoquía with a prosperous, environmentally sustainable, market-oriented agriculture with ample areas for distinctive ecological and cultural tourism activities.

Background

Purdue University and the Escuela Superior de Administración Pública (ESAP) signed a special cooperative agreement in which Purdue developed cutting-edge analytical research tools that support the decision-making process and promote understanding of the economic opportunities for agriculture and tourism in the region.

Purdue researchers led the Orinoquía Initiative in collaboration with ESAP, Universidad de los Llanos (UNILLANOS), Universidad de los Andes (UNIANDES), Universidad Nacional de Colombia (UNAL), Agrosavia (formerly Corporación Colombiana de Investigación Agropecuaria, CORPOICA), Colombia's Departamento Nacional de Planeación (DNP), the Ministerio de Agricultura y Desarrollo Rural and the Viceministerio de Turismo, along with not-for-profit organizations and departmental and municipal governments.

The Orinoquía Initiative focused on the following departments (states) in the Orinoquía: Arauca, Casanare, Meta, Vichada, as well as the neighboring departments of Guaviare, Guainía and Vaupés.

Opportunities and Challenges

The extensive biodiversity in Colombia represents an opportunity for economic development of tourism, scientific inquiry, and ecosystem services. To address finding a sustainable balance requires baseline studies and regional land-use models that describe the consequences of alternative courses of development.

Economic development in the Orinoquía region could provide opportunities for Colombians all along the entire socio-economic ladder. Modern infrastructure, Extension services, education, and growth of the formal business sector and farmers' associations would help improve labor and productivity in the region and contribute to the country's overall development.

Data Collection, Model Development and Training

The Orinoquía Initiative team used data collected from tourism associations, farmers and farmers' associations in the development of analytical models and model frameworks. These tools and models can be used to inform decisions related to project evaluation, business planning, agricultural land-use and answer various "what-if" questions related to resource constraints (land, labor, capital, etc.), new crops and crop systems, alternative technologies, business structures and commodity market values.

The linear programming models represent a practical method for farm management and for training extension personnel in assisting farmers with decision-making. University and Extension personnel can use the models to explore the viability of specific recommendations for potential changes in the economic and technical production parameters as they occur within a region.

Training workshops for policymakers and university researchers addressed how to tailor the models to different regions as reflected by different levels of productivity, alternative resource availability, different pricing for products and inputs, alternative enterprises and government policies. The data embedded in the existing models serve as the initial values that can be added to in order to reflect local variations.

Agriculture Case Study Summaries

The focus of the case studies and modeling activities was to gather information on farming opportunities and management practices combined with market opportunities, marketing and finance research for the Orinoquía region.

For example, a promising portfolio of enterprises for a medium/large farm in the Piedemonte included citrus, oil palm, farmed fish, mangostino, and fattening of beef cattle. The fattening of beef cattle also included silage operation.

Since much of the finishing or fattening of cattle from the entire Orinoquía is done in the Piedemonte, it is important to identify technology for this sector. We expect silage production from various crops to be an increasingly important activity for high-production dairy producers and fattening operations, as well as for both small- and medium-sized farm activities.

In the Altillanura, there is high potential for combining annual crops with beef or pork production. Altillanura annual grain and forage crops were studied including rice, maize and soybeans. Perennial crop-data collection focused on oil palm, cacao, cacay nut, cashew and rubber.

Observations from the Case studies

Health concerns resulting from excessive chemical use by the Ariari fruit producers and the dangers to human health need to be addressed with the use of improved biological controls and pest management practices.

Market Economics need to be considered in developing future initiatives such as providing timely information to farmers concerning demand and supply indicators in order to temper the oversupply phenomenon and lead to more stable prices. The classic economic issue of few buyers and many sellers when selling a homogeneous product to the wholesale outlet in Bogotá is a concern, which results in the perception that price fixing is a problem in these cases. Combatting price fixing could include farmers to both collectively market and find alternative markets.

Silage and Pasture Renewal in the Piedemonte and Altillanura is another critical input for dairy and cattle fattening operations in the Piedemonte. The production of silage could be a viable input to improve the nutrition and productivity of dairy cows and to prevent or moderate the weight loss during the dry season (December-March).

Agriculture Pilot Projects

Based on the case study analyses, five economically promising agricultural pilot projects were identified. The agricultural pilot projects will demonstrate practical applications of the analysis tools developed,

extend knowledge to develop additional decision tools, and evaluate alternative courses of action and their probable consequences. They are intended as a guide for potential future investments in knowledge and capacity for the Orinoquía region.

Fruit Production in the Piedemonte and Casanare Foothills

- The small and medium farmers who are predominant in the foothills of Meta and Casanare need to specialize in order to market high quality and quantity to the Bogotá market. They also need to prepare for the continuing price declines over time by acquiring technical and marketing knowledge about the next fruit crop for market.
- Value-added alternatives for fruits should be explored. For instance, juice from the latest high-priority crop, such as passion fruit. In addition, fishpond production is a highly profitable activity and expanding rapidly in the Piedemonte.
- Technical training in marketing and business methods is needed. A long-term objective could be a master's degree program in agricultural economics.

Beef Production and Ecotourism in the Flooded Savannahs

- Many of the current agricultural production practices appear to be unsustainable due to challenges posed by landforms in the flooded savannah, including water availability during dry periods, soil quality and a general lack of sustainable water-management planning.
- Sustainable land- and water-management strategies are critical to achieve agricultural and economic development, mitigate risks associated with future climate change and variability, and maintain biodiversity in the region.
- Simulation and modeling tools would inform decision-makers on the best projects that demonstrate how beef production can be integrated with production of agricultural crops, while maintaining the rich biodiversity in the region and utilizing the integrated systems to promote ecotourism.

Integration of Pork and Grain Production in the Altillanura

- Key concerns facing integrated pork and grain production in the Altillanura are related to local farmer opposition to contract production mechanisms and concerns about environmental degradation from intensive crop production and fertilization.
- Purdue University could support ongoing rural education efforts that include a management tool in the form of a mathematical programming model, and workshops focused on the use of the programming model and the alternatives and consequences of vertical coordination would be included in the deliverables.

Transportation and Options in Vichada

- A preliminary analysis of Vichada's agricultural opportunities suggests that cashew may be a good option. Processed cashew is a relatively high-value product that may be profitable even with high transportation costs.
- Various forestry products and some tropical fruits are also options in Vichada. However, the transportation costs are an issue.
- Using amended versions of the linear program could create new case studies to better understand how these various alternatives fit together.

Food Supply for Agriculture Workers

- There is an opportunity to add value to farmers' products, reduce costs and potentially increase quality for agriculture workers by organizing the local supply of fresh fruits and vegetables delivered directly from farms to agriculture workers and/or processing facilities.
- This activity as a model could be extended to other sites of small-population concentration.

In brief, the linear programming models developed by Purdue play an integral role in product selection and production efficiencies and in understanding access to global and domestic markets. With the promotion and adoption of the analytical tools as well as continued training on them, Colombian university and Extension personnel will be prepared to play an essential role in facilitating and educating farmers to take advantage of the analytical modeling tools that are essential to the success of the farmers.

It is our vision that the adoption of the analytical tools would improve efficiencies, increase market understanding, and positively impact Colombia's agriculture for the future.

Purdue Sustainable Tourism Fieldwork

There is considerable enthusiasm for tourism in the Orinoquía and evidence of consumer demand for the region. However, these positive outcomes require deliberate action by a variety of actors within the destination system.

Opportunities in destination and select niche markets, such as heritage celebrations for the Los Llanos area, birdwatching, and cultural tourism were explored in a series of meetings with tourism industry members from organizations in Yopal, nearby San Juan de Palenque and in Meta.

Orinoquía Sustainable Tourism Development Model and Knowledge Resources

The Orinoquía Sustainable Tourism Development Model has been modified for local needs and is based on the Global Sustainable Tourism Criteria (GSTC).

The model incorporates a systems approach to guarantee sustainable tourism. From the perspective of the destination, tourism takes place in a series of integrated systems: tourists, companies, cluster destinations and the broader social/economic/political system. To maximize the benefits of tourism, each of these systems must perform key tasks that maximize the benefits of tourism and/or reduce tourism costs. To have optimal performance, each level of the system must function effectively and support the others. This model addresses the tasks and functions at each level of the tourism system required to achieve sustainable tourism.

Applications of the Orinoquía Sustainable Tourism Development Model are expected to increase significantly in coming years. The tourism model provides a useful framework for analysis of the issues facing the region and contributes to the implementation of sustainable tourism practices.

A portfolio of resources for members of the destination systems in the Orinoquía includes self-assessment tools, "tip" sheets, case studies and white papers.

Sustainable Tourism Pilot Projects

Three pilot projects for sustainable tourism activities are centered on the destination incubators and sector-based or niche-market clusters as well as the design integration of supply chains.

Foundational activities for developing Yopal and nearby municipalities as a tourism destination

- Foundational activities will examine the integrated systems involved in tourism activities. The Orinoquía Sustainable Tourism Development Model will be employed to address the tasks and functions at each level of the tourism system that are required to achieve sustainable tourism for all stakeholders in Yopal and nearby municipalities.

Market framework for developing the Llanos (Meta, Casanare and Arauca) as a tourism destination

- Market framework for developing the Llanos (Meta, Casanare and Arauca) as a tourism destination builds on the foundational work and would be customized to the specific needs of the destination, and discovery from the projects would be transferable to other destinations and locations.
- Possible destinations for the pilot “incubator” projects include Lejanías, San Juan de Arama, La Macarena/Caño Cristales, Puerto Carreño/Tuparro, and Yopal.
- Possible sectors include agrotourism, birdwatching, and sports fishing. Development of these market sectors could integrate with possible agricultural opportunities in Meta, Casanare and Arauca identified in the agricultural pilot programs.
- Both the destination and sector-based clusters pilot projects would include the following support and management advice: collaborative cluster process support, technical support of both destination marketing operations and operators, including marketing and product development support; and project monitoring systems and performance management advice.

Developing the tourism supply chain

- The inclusion of small and micro-enterprises is a key strategy in maximizing economic benefits of tourism and providing authentic cultural experiences. The project focuses on three inter-related issues: business planning and business development; product and experience development; and marketing.
- The project supports the development of highly differentiated destinations providing authentic, unique experiences and builds on the established practices of several destinations providing important supplemental work of the NGOs and Ministerio de Comercio, Industria y Turismo de Colombia (MinCIT) in these regions.

Findings from the Orinoquía Initiative

Colombia would benefit from a mix of large, medium and small farms and businesses in the Orinoquía region. Medium- and small-scale businesses are already competing in many domains and could compete more effectively with a modest level of applied research-Extension investment.

Need for an Extension Service – The Orinoquía desperately needs an Extension Service system that benefits from the synergies among education, research and the Extension services.

Optimal Scale – Although the economically optimal scale varies by activity, in general, there are no inherent economic advantages for large-scale agricultural and tourism businesses over medium- and small-scale alternatives in the Orinoquía.

Tourism development must recognize not only economic but also social and environmental goals to optimize benefits for the region in terms of optimal scale.

Supply Chain Relationships – Making the most of Orinoquía agricultural opportunities requires development of supply chains that respond to the needs of every link in the chain.

Similarly, engaging micro-enterprises like artisans and local food producers in the value chain for tourism is critical to share the benefit from these activities through the destination communities.

Importance of Market Development Activities – Preliminary market development activities are key to the successful creation of new farms and businesses, especially in tourism. These include research on consumer markets, development of distribution relationships, and foundational marketing activities. Market and product/destination development must happen at the same time and are mutually reinforcing.

Environmental Sustainability – Issues of social and environmental sustainability should remain an ongoing discussion as enterprises and activities develop in the Orinoquía. Protecting the environment should be a crosscutting objective for future activities.

Attracting/Developing Labor and Expertise – Development of medium- and small-scale agricultural and tourism businesses is a key opportunity for attracting labor and expertise to a region.

International Collaboration as Catalyst – The Orinoquía Initiative led by Purdue University and the associated Technical Committee comprised of the UNILLANOS, UNIANDES, UNAL, DNP, ESAP, Agrosavia, Ministerio de Agricultura y Desarrollo Rural and the Viceministerio de Turismo shows the potential for an international collaboration to connect Colombian stakeholders for the future development of the region.

Next Steps

Based on discussions with Colombian stakeholders, next steps include the following:

- Implement the agriculture and tourism pilot project proposals to reinforce agricultural and tourism planning capacity in the region.
- Promote the adoption and use of the analytical modeling tools developed by Purdue. Continue modeling activities for specific regions and incorporating policy analysis.
- Develop an Engaged University model for Colombia based on the U.S. land-grant university concept to enhance rural higher education that will communicate applied research results to help local producers improve agricultural production.
- Reinforce agricultural and tourism planning capacity in the region through additional training for national, departmental and municipal planning staff, and through joint research and engagement projects with Agrosavia, UNILLANOS, UNIANDES, Unitrópico and other Colombian institutions.
- Strengthen the capacity of primary, secondary and tertiary educational institutions in the Orinoquía to respond to the urgent need for a trained workforce in the region.
- Increase water-management information in the area and develop land-use and water-management tools with stakeholder participation to resolve the development impasse in the Casanare and Arauca departments.



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