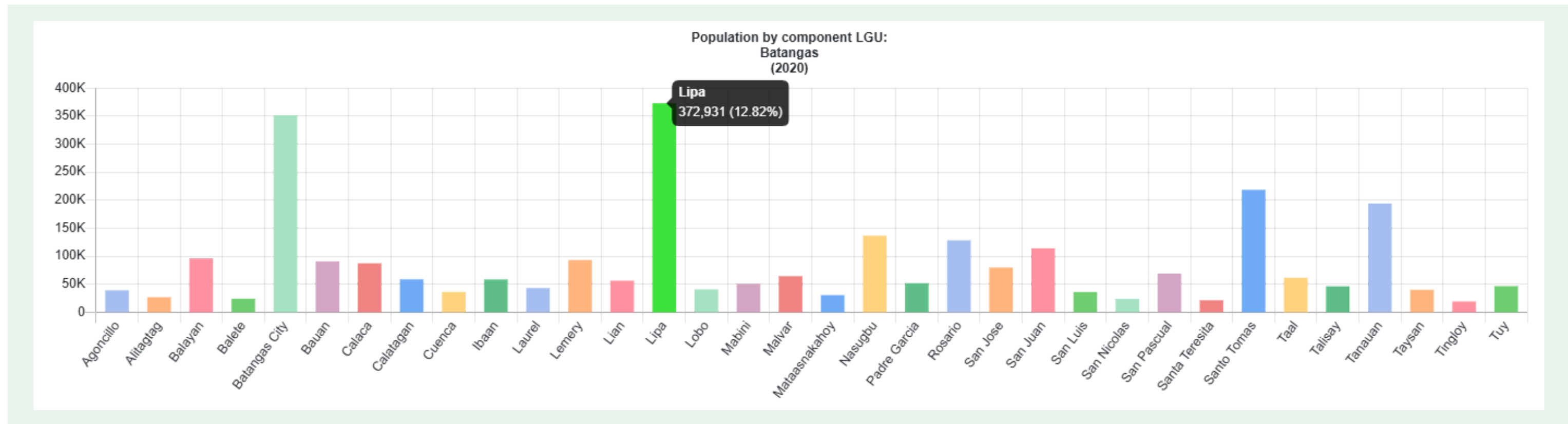
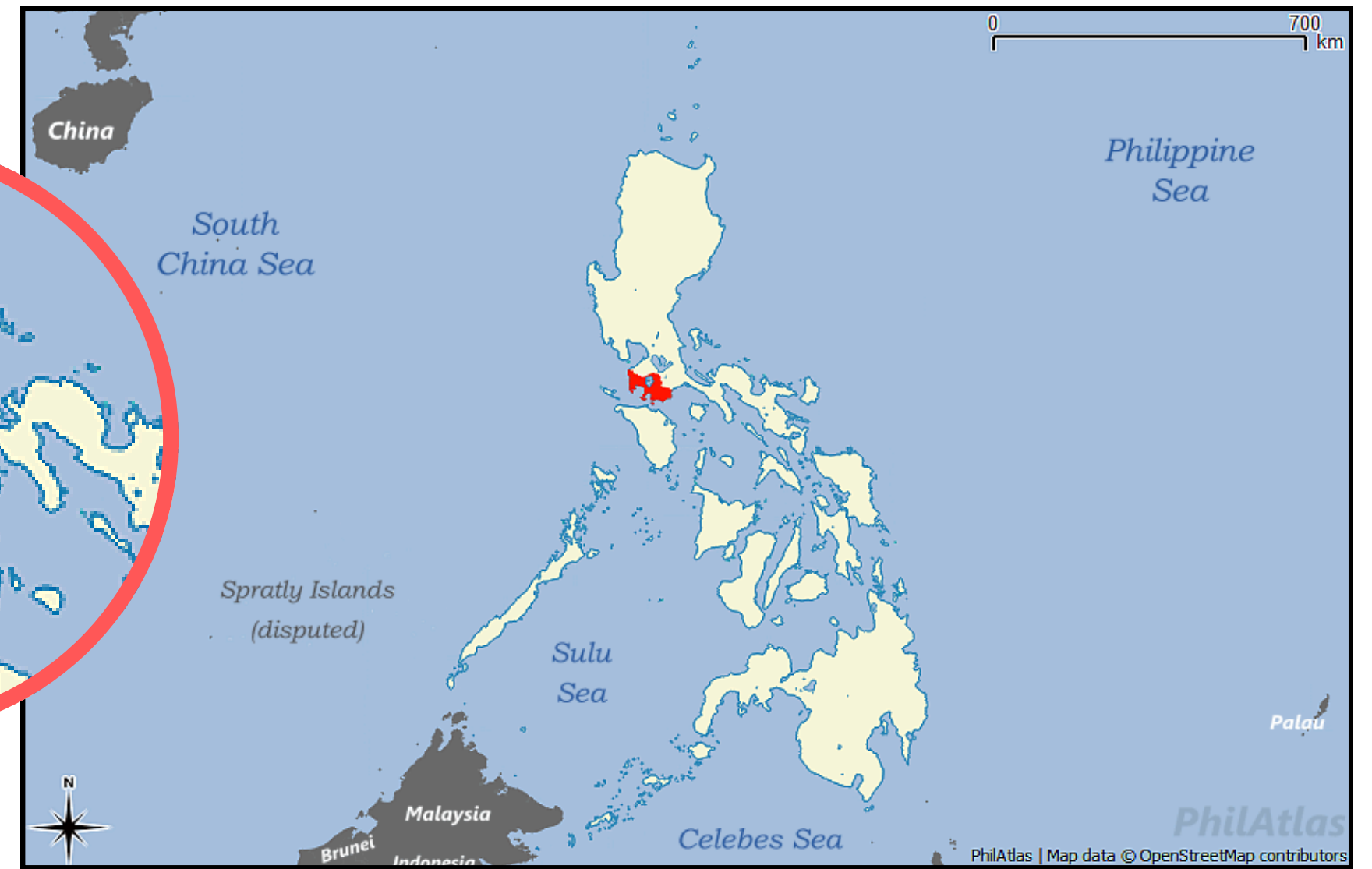




**FROM LAND SUITABILITY TO INVESTMENT SECURITY:
THE FUTURE OF BLACK PEPPER STARTS HERE.**



leila.tura@dls.edu.ph



CORE IDEA

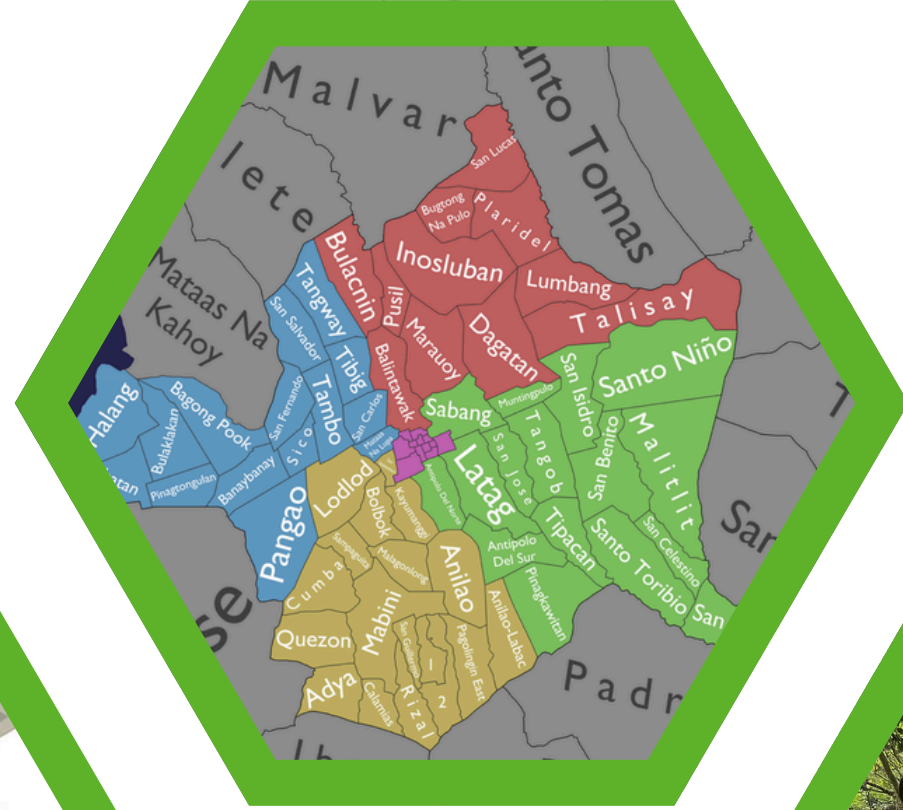
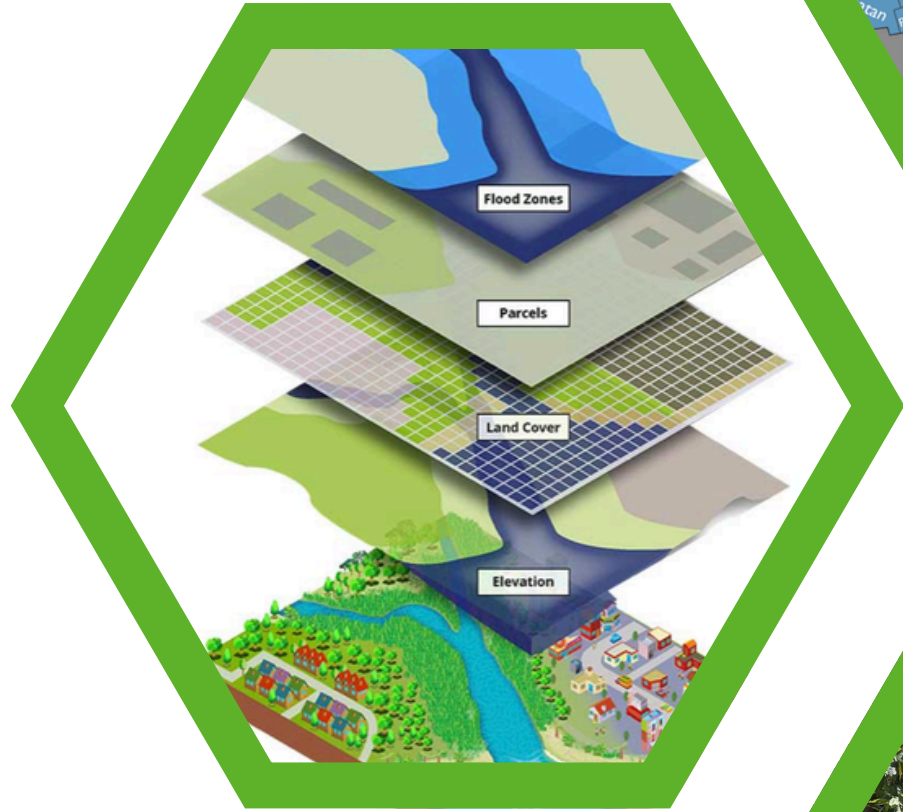
To apply GIS-based spatial modeling and predictive analytics to identify the current and future suitable areas for sustainable black pepper (*Piper nigrum* L.) cultivation in Lipa City, Batangas, supporting climate-smart agriculture, land-use optimization, and local agri-based green development.

KEY OBJECTIVES

- Map and characterize existing black pepper production zones using GIS
- Analyze relationships between pepper distribution and climate, soil, elevation, land use, and cultural practices
- Develop predictive distribution models under climate variability and land-use change scenarios
- Identify future high-suitability zones to guide sustainable expansion, conservation, and policy planning



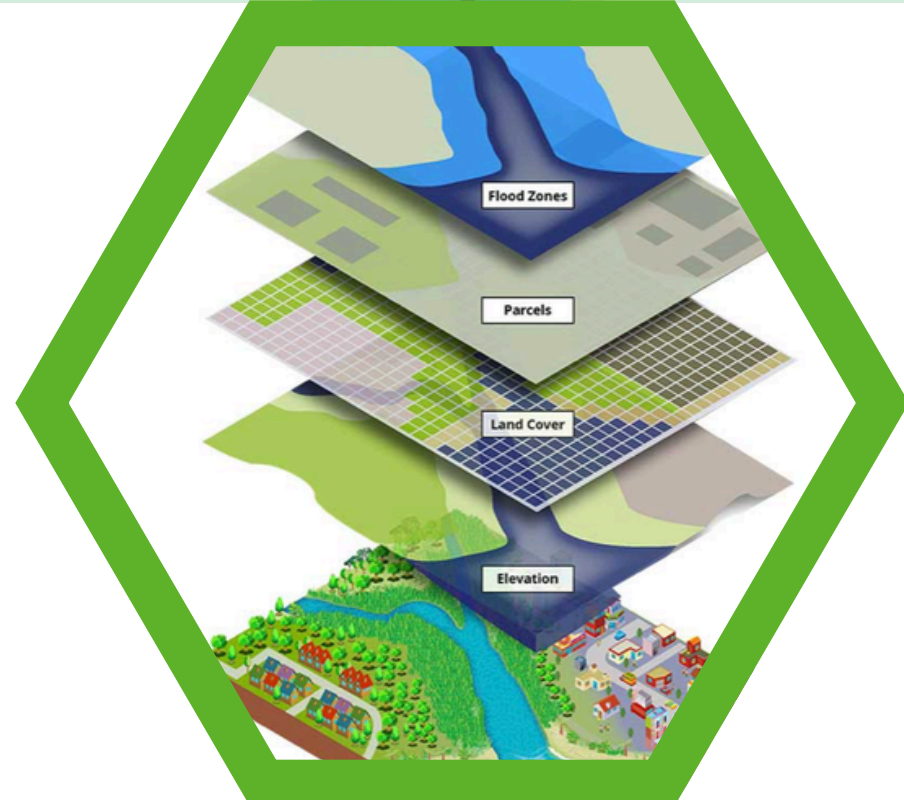
GIS STUDY FOR LAND SUITABILITY



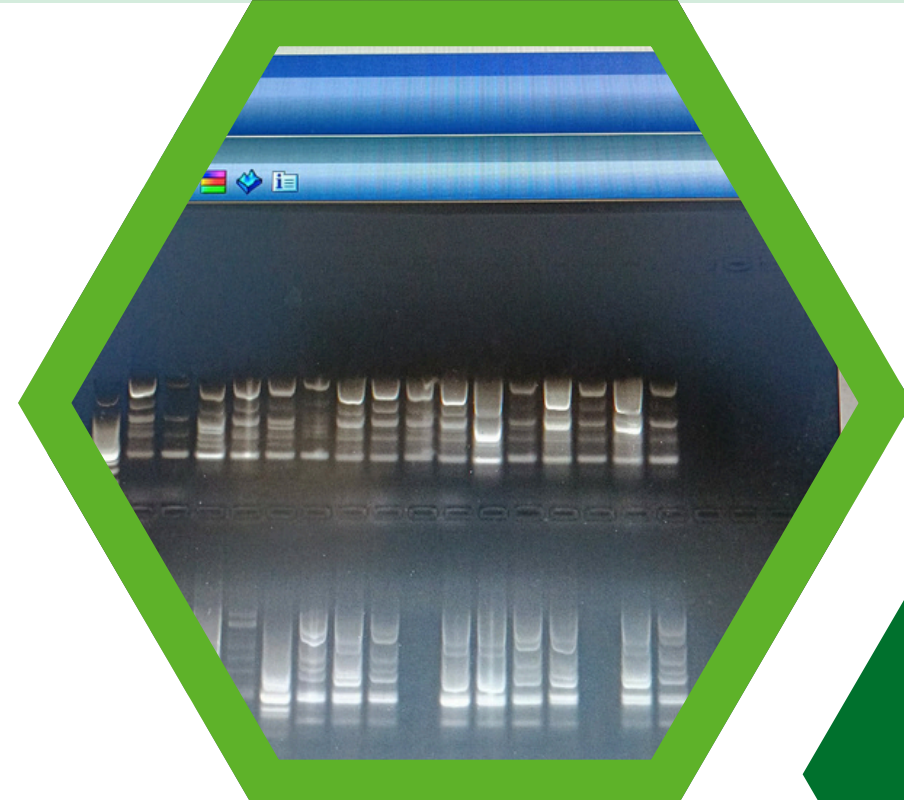
MARKET GAP AND OPPORTUNITY



MARKET GAP



GIS STUDY



DNA



MARKET OPPORTUNITY



BUSINESS MODEL CANVAS

Batangas Paminta Integrated GIS & Processing Hub

KEY PARTNERS

- Academic**
 - GIS & climate research institutions
 - Agroecology experts
 - Environmental engineering collaborators
- Government**
 - Lipa City LGU
 - Provincial Agriculture Office – Batangas
 - Department of Agriculture (DA)
 - Land-use planning agencies
- Community**
 - Farmer cooperatives
 - Local growers
 - Barangay agricultural units
- Industry**
 - Food manufacturers
 - Spice processors
 - Export traders
 - Agri-tech system developers

CUSTOMER RELATIONSHIPS

- Long-term supply contracts (restaurants & wholesalers)
- Contract growing agreements with farmers
- Strategic partnerships with LGUs
- Technical advisory & agronomic support
- Subscription access to spatial decision tools
- After-sales quality & traceability support

KEY ACTIVITIES

- Research & Intelligence**
 - Spatial modeling & climate forecasting
 - Land suitability mapping
 - Data validation & updating
- Production & Commercial**
 - Farmer coordination & contract growing
 - Pepper processing & grading
 - Packaging & branding (Batangas Paminta)
 - Market linkage & distribution
- Policy & Scaling**
 - LGU integration into land-use plans
 - Investment promotion
 - Expansion to other high-value crops

CHANNELS

- Processing & distribution hub (physical facility)
- Online selling platforms (B2B marketplace)
- Direct supply contracts
- LGU technical presentations
- Policy briefs & spatial reports
- Academic publications & conferences
- Investor pitch decks
- Digital GIS dashboard (future SaaS model)

REVENUE STREAMS

- Agricultural Revenue**
 - Sale of processed black pepper (bulk & retail packs)
 - Premium pricing for authenticated Batangas-origin pepper
 - Export contracts
- Service-Based Revenue**
 - GIS-based consultancy services
 - Land suitability assessment services
 - LGU-funded development studies
 - Subscription-based GIS decision-support tools

KEY RESOURCES

- GIS software & spatial datasets
- Climate, soil, land-use data layers
- Machine learning & MaxEnt modeling systems
- Processing & packaging facility
- Quality testing equipment
- Skilled research & technical team
- Farmer network in Lipa & nearby barangays
- Institutional backing (e.g., De La Salle Lipa)

CUSTOMER SEGMENTS

- Food manufacturers & spice brands
- Restaurants & food business sector
- Retailers & wholesalers of high-value crops
- Export traders (Southeast Asia market)
- Local Government Units (LGUs)
- Agricultural investors
- Farmer cooperatives
- Agri-tech & data service users

VALUE PROPOSITION

- For Government & Planners**
 - GIS-based crop zoning & predictive land suitability
 - Climate-smart agricultural expansion strategy
 - Evidence-based land-use planning tools
- For Farmers**
 - Identified high-yield planting zones
 - Reduced climate & investment risk
 - Contract growing opportunities
 - Intercropping & diversification guidance
- For Market Buyers**
 - Authenticated "Batangas Paminta"
 - Traceable geographic indicator (GI-supported positioning)
 - Stable supply through mapped expansion planning
 - Quality-assured processing & distribution hub

COST STRUCTURE

- Research & Technology Costs**
 - GIS software licenses
 - Satellite imagery acquisition
 - Data storage & cloud services
 - Personnel (researchers, GIS analysts)
- Operational Costs**
 - Processing equipment
 - Packaging materials
 - Utilities
 - Salaries & labor
 - Logistics & transportation
 - Marketing & branding

SCIENTIFIC CONTRIBUTIONS

- First localized GIS-based ecological niche model for black pepper in Lipa City
- Quantitative understanding of agro-meteorological and edaphic drivers of black pepper productivity
- Baseline data for climate adaptation, conservation, and crop zoning strategies

TECHNOLOGICAL CONTRIBUTIONS

- Development of GIS-based land suitability and forecasting maps
- Application of MaxEnt and machine learning models for agricultural decision-making
- Potential intellectual property from integrated spatial-agroclimatic modeling workflows



CULTIVATION OF NON-NATIVE VARIETIES





THE TEAM



Leila M. Tura, MSc

- Department Chair and a faculty member of the Biology Department at De La Salle Lipa
- MS in Genetics and BS in Agriculture (Agronomy) from the University of the Philippines Los Baños
- Academic and research expertise spans genetics, biochemistry, molecular biology, and biotechnology, with research experience in plant genetics, tissue culture, and embryo biotechnology.



Donna Garcia, MSc

- Program Chair and Faculty of the Computer Science Department of De La Salle Lipa
- PhD candidate at Mapua University, had MS in Computer Science and BS in Computer Science from Batangas State University
- Had worked data analyst, programmer, IT QA Specialist, Senior Software QA Engineer and Business Systems Analyst.



Vivienne Padura, MSc

- Faculty, Diploma of Science and Engineering at Monash College, Melbourne, Victoria
- PhD candidate at Victoria University - Australian Government RTP Scholarship recipient and MS in Environmental Science from the University of the Philippines Los Baños under DOST-SEI Program
- Works as an environmental consultant and environmental preparer for DENR, LLDA, PAMB related projects



Engr. Jon Errol Sunga, MSc

- Faculty member of General Engineering Area and Research Program Coordinator at De La Salle Lipa
- MS in Environmental Engineering from UP Diliman and BS in Chemical Engineering from UPLB
- Had been in the academe for more than 10 years and with background on GIS



Patricia Dimaculangan

- Faculty member and Laborat of the Biology Department at De La Salle Lipa (DLSL)
- Enrolled in MS in Environmental Management at UP Open University and BS in Biology from DLSL



FUNDING ASK (10,000 USD)



MULTIMETER DEVICES (4000 USD)

- For primary data gathering



Computing Device (1400 USD)

- For data processing



GIS Software Subscription (2000 USD)

- For GIS study



Logistics (2600 USD)

- Engagement with community and farmer organizations

THANK YOU!

**FROM LAND SUITABILITY TO INVESTMENT SECURITY:
THE FUTURE OF BLACK PEPPER STARTS HERE.**

 leila.tura@dls.edu.ph

