FONAFIFO GEOGRAPHIC INFORMATION SYSTEM NEEDS ASSESSMENT REPORT

Executive Summary

Submitted by:

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This GIS Needs Assessment Report is respectfully offered to the Government of Costa Rica. This report provides various recommendations regarding the current and future use of Geographic Information System (GIS) technologies within the National Forestry Financing Fund (FONAFIFO).

It is intended for your use in exploring new strategic directions for your geospatial program. This plan puts forth recommendations regarding GIS related hardware, software solutions, specifications, costs, risks and benefits, and implementation options.

Open source - I recommend the continued use, development and expansion of QGIS and related components, e.g., SIPSA or within SIPSA. The FONAFIFO applications using these open source solutions are **very impressive.** These applications excel at tracking, syncing and managing the PPSA program's dual processes – the contractual/legal workflow and the GIS mapping/Regent/Owner workflow. I have trouble finding much to criticize in the many modules, protocols, cross-checks, processes or physical technology footprint.

FONAFIFO uses GIS extensively in many aspects of mission-critical tasks, successfully integrating formerly incongruent workflows and eliminating tasks. Accessibility of digitized information provides enormous operational efficiencies to FONAFIFO staff, PPSA participants & applicants, Regents, etc.

However, there is a *real risk* to using a custom developed, open source solution. Losing the software engineer that created it can severely impact a complex project. Progress in cross training needs to continue until all aspects of the coding, routines are documented, able to be run by other staff. This is extremely important. Be prepared, some problems may take time to resolve without paid support.

Desktop GIS software - I recommend the continued use of ArcGIS in the current configuration. It functions well, meets your needs and provides the ability to greatly leverage your existing investment through ArcGIS Online (AGOL). This can provide important GIS capabilities quickly and affordably. Including the free Operations Dashboard to give managers a real-time view of productivity metrics.

I recommend the implementation of an AGOL-based Public Access GIS Viewer. The ROI cost savings over developing a custom open source solution are *significant*. The coding of the AGOL-included spatial analysis functionality will take many months (years?) to develop using custom code, with plug-ins.

Public Access GIS Viewer - I recommend budgeting $2,000 annually (at most) to pay maintenance fees for one copy of ArcGIS Desktop to enable one ArcGIS Online account. Quickly and easily publish a FONAFIFO Public Access GIS website and other targeted GIS websites. Templates and the Web Application Development Framework provide code-free, easy-to-learn development environments.

- Quickly and nimbly serve up Public Access and stakeholder targeted GIS web map apps
- Leverage the ArcGIS Online Map Viewer and save very significant development costs
- Outsource security and software administration to the AGOL Cloud
- Provide for a disaster recovery repository

Handheld mobile GPS devices - I recommend the use of an open source solution such as ODK Collect to collect data on handheld devices in the field. Your form should be straightforward to create. My recommendation is driven by the significant expenses related to Collector for ArcGIS or another vendor

developed solution. The adoption of Android OS for the handhelds is a solid decision. Hopefully the continued testing of the new GPS devices will be successful.

UAVs - UAVs (drones) offer a technology that could vastly improve productivity by reducing time spent in the field. However, given the difficult environmental conditions, a water resistant, ruggedized model is recommended.

Respectfully yours,