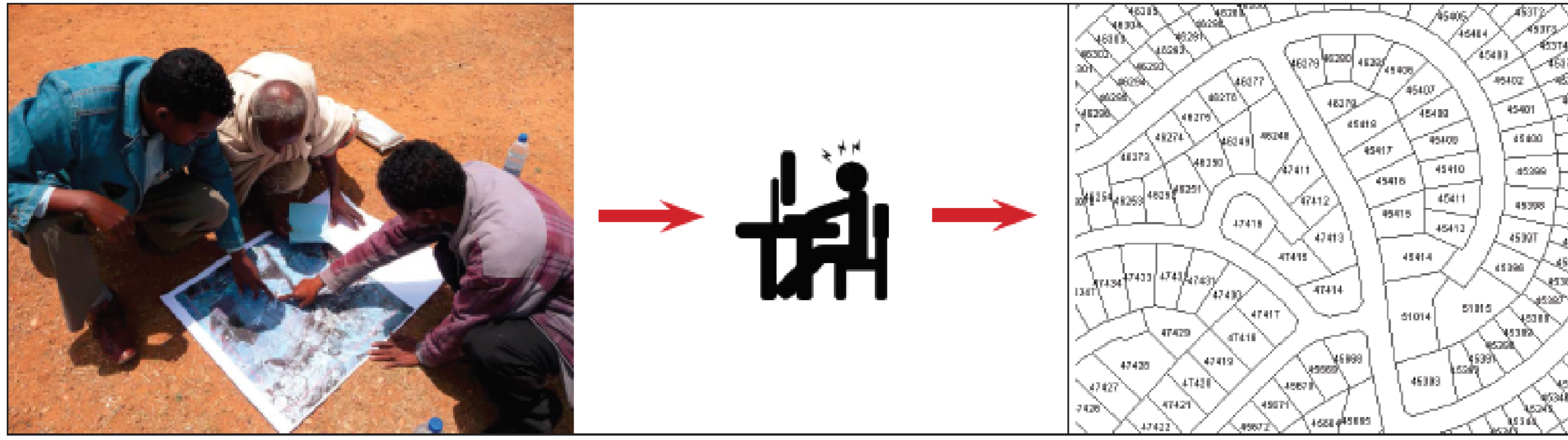
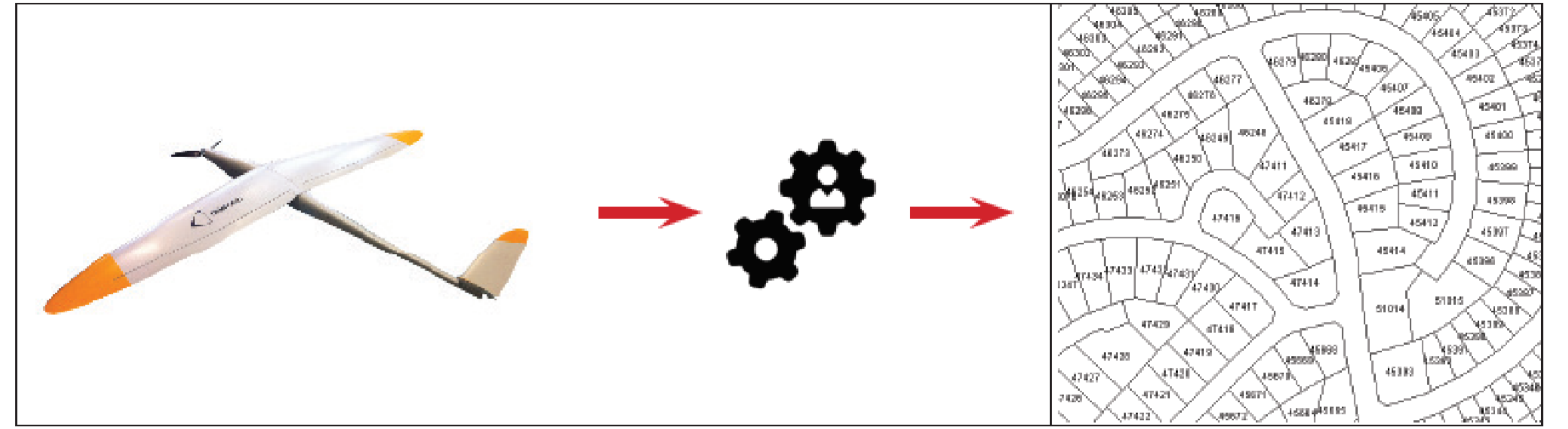


## State-of-art workflow



## Envisoned workflow



## Introduction

- Trends:** Unmanned aerial vehicles (UAVs) have gained increasing popularity in remote sensing. Cadastral mapping (capturing the extent, value and owner ship of land) has emerged as field of application for UAVs.
- Assumption:** Cadastral boundaries are often demarcated by objects that can be extracted automatically with image analysis methods.
- Research Gap:** UAV-based cadastral mapping is rarely explored and to no extent automated.
- Goal:** To develop a UAV-based cadastral mapping tool that contributes to recent endeavors in fit-for-purpose land administration for more reproducible, transparent, automated, scalable and cost-effective mapping procedures.

## Approach

- Review case studies on (cadastral) mapping applied to remotely sensed data and the listed methods for automated feature extraction.
- Design hypothetical workflow for automated feature extraction from high-resolution optical data.
- Determine optimal methods for workflow by testing them on UAV data in terms of detection quality and localization quality of visible boundaries.
- Design and implement QGIS plugin that combines optimal methods and guides human interaction for the final delineation.

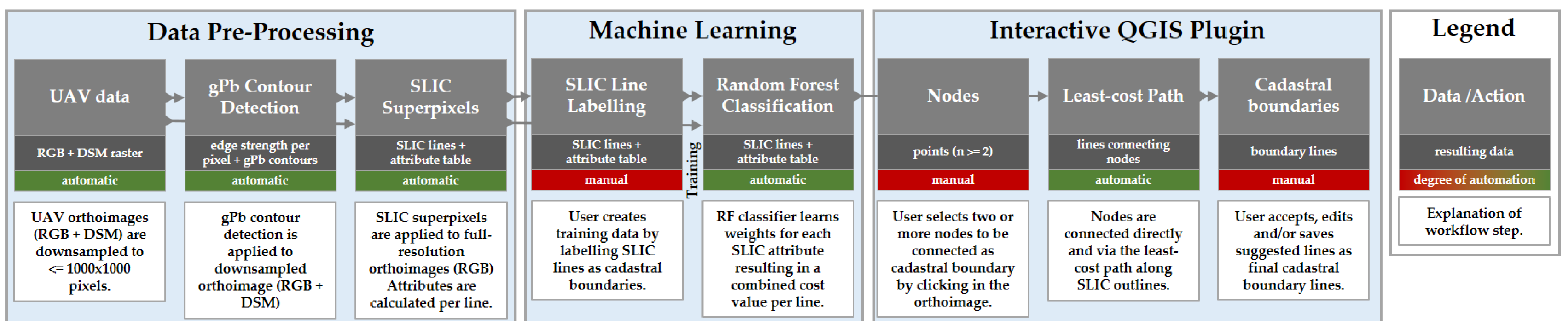


Figure 1: Conceptual workflow of delineation tool for automated boundary delineation of visible cadastral boundaries from UAV data.

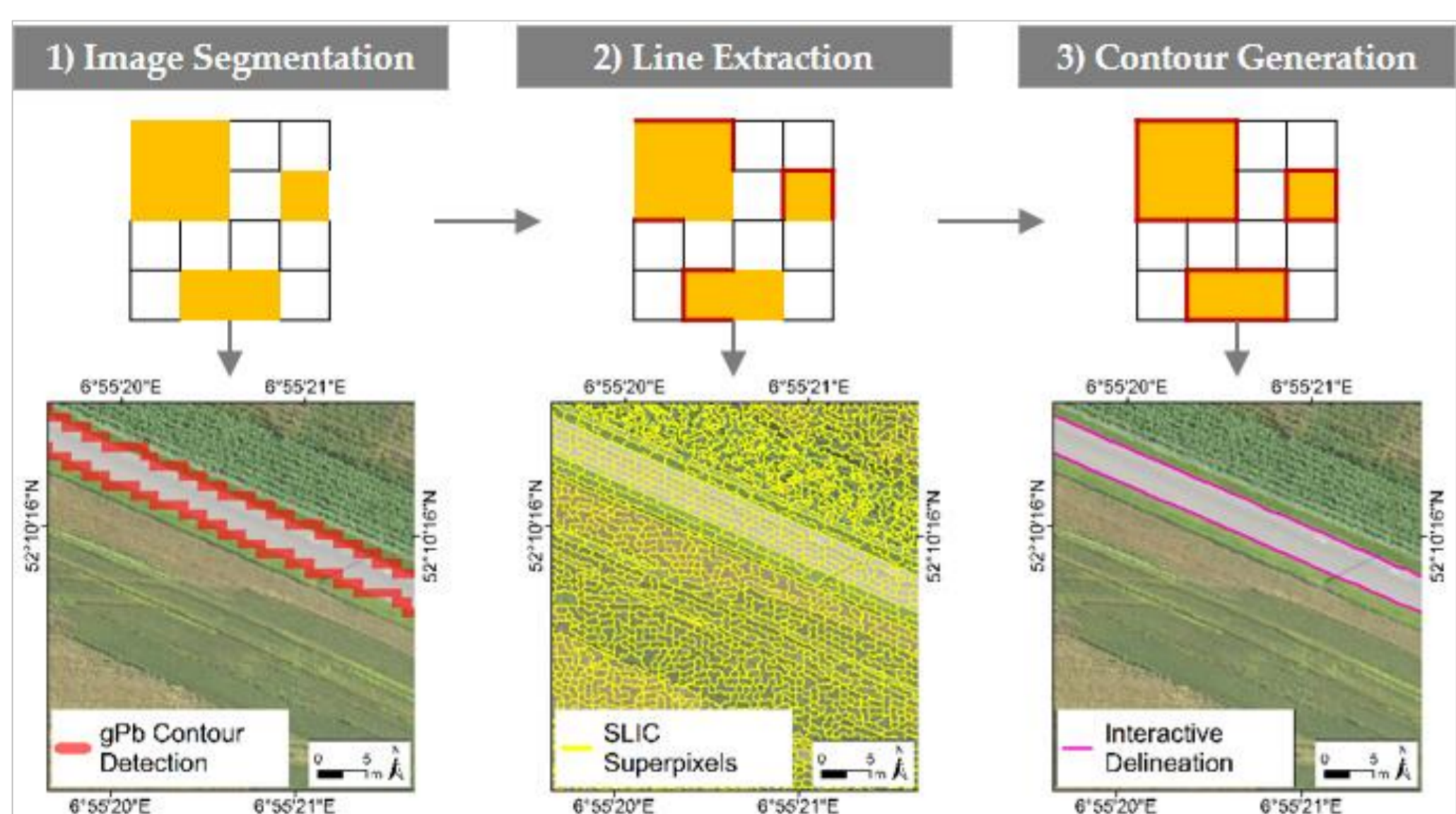


Figure 2: Sequence of commonly applied workflow steps to extract objects related to those manifesting cadastral boundaries from high-resolution optical sensor data. These steps have been evaluated positively for UAV-based cadastral mapping.

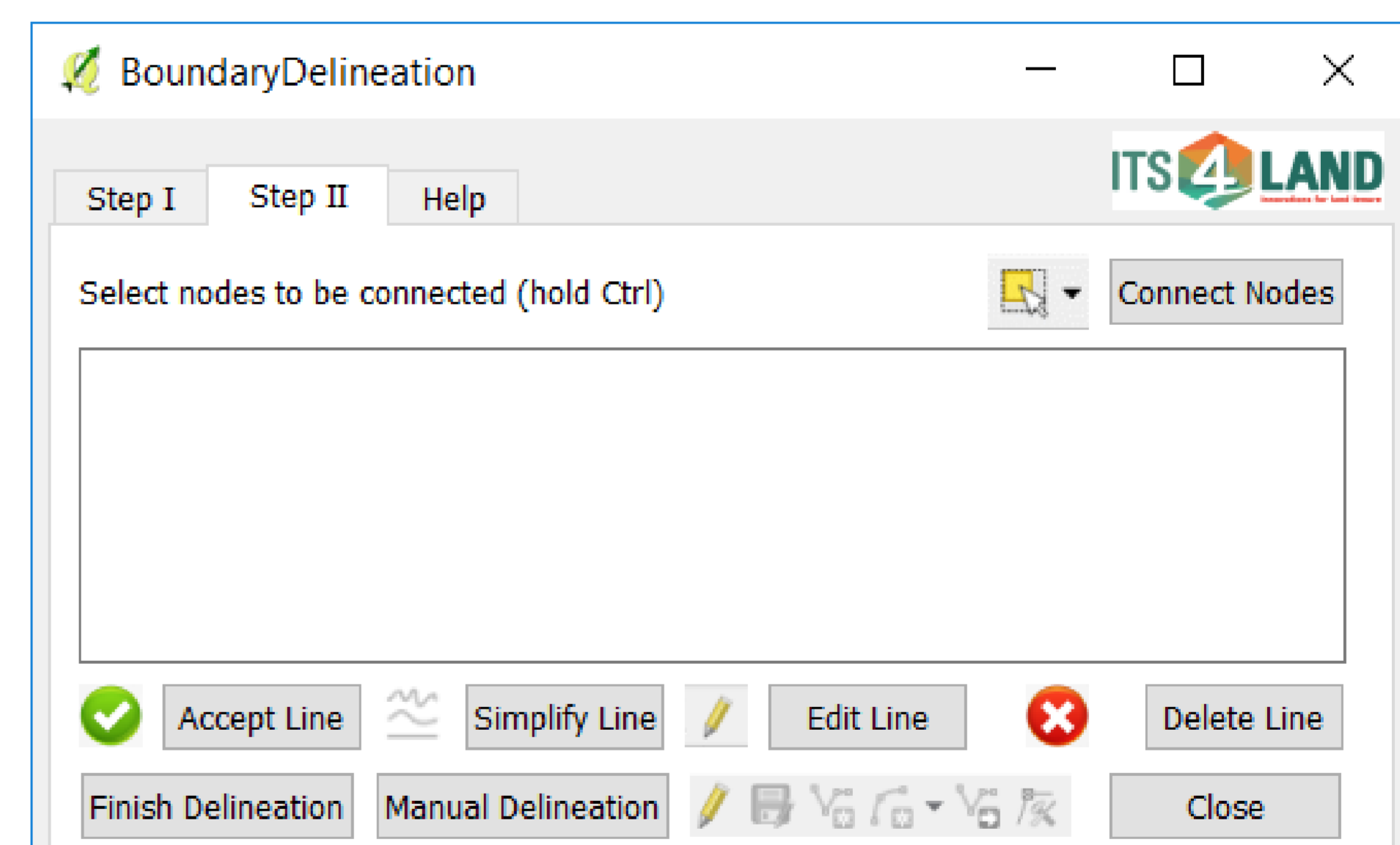


Figure 3: GUI of QGIS Plugin 'Boundary Delineation' currently under development to guide the human interaction and the delineation of final cadastral boundary lines.

## Conclusion

- The proposed workflow bears potential to generate a tool for cadastral boundary delineation that is highly automatic, generic and adaptive to different scenarios.
- Methods from computer vision bear potential for solving the described task and are transferable to remote sensing data of high-resolution.
- The approach is most suitable for areas (i) where object contours are clearly visible and coincide with cadastral boundaries and (ii) where concepts such as fit-for-purpose and responsible land administration are accepted or in place.
- Future work will focus on the tool's transferability to different scenarios and its in-field applicability.

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