



Terra-Fresh

# Visualization & Planning Units

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<http://ilpil.asu.edu>, [www.terra-fresh.com](http://www.terra-fresh.com)



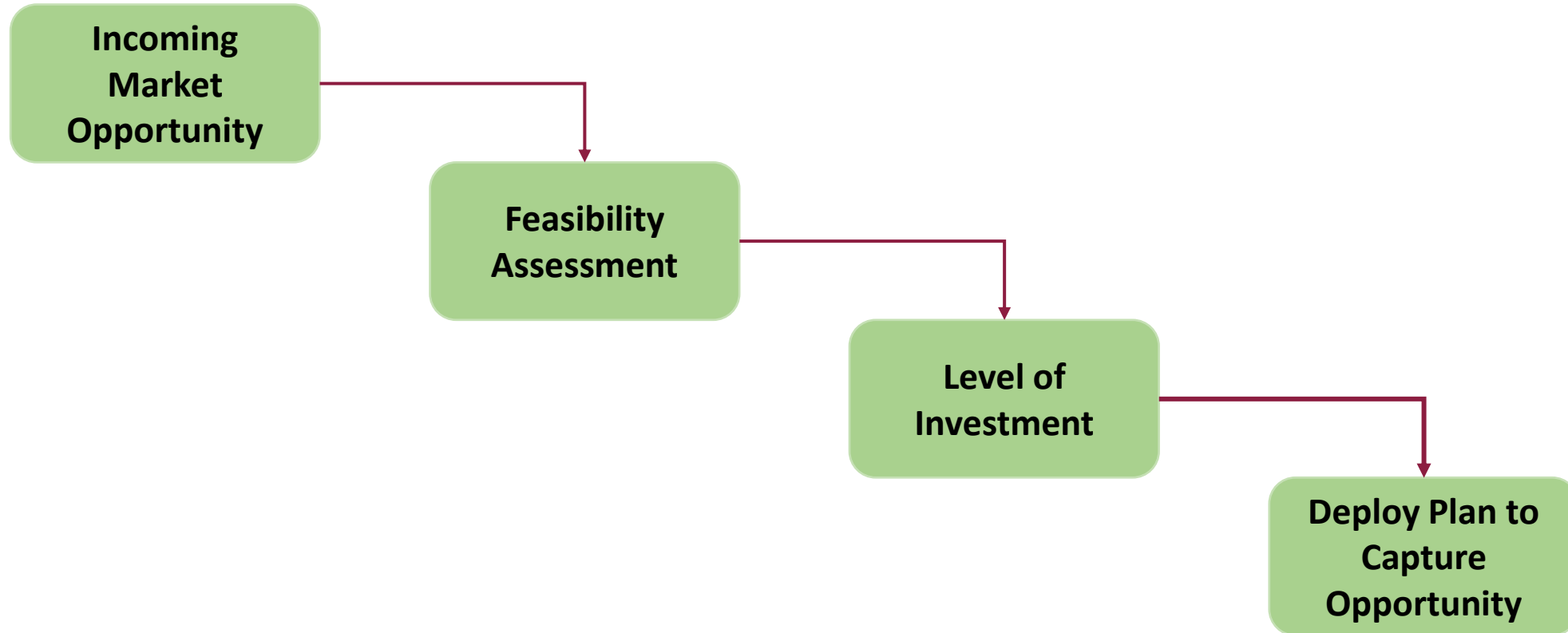
# Agenda

- Motivation
- Planning Units
- Yield Model
- Planning Units Visualization
- Potential Impact & Closing Remarks

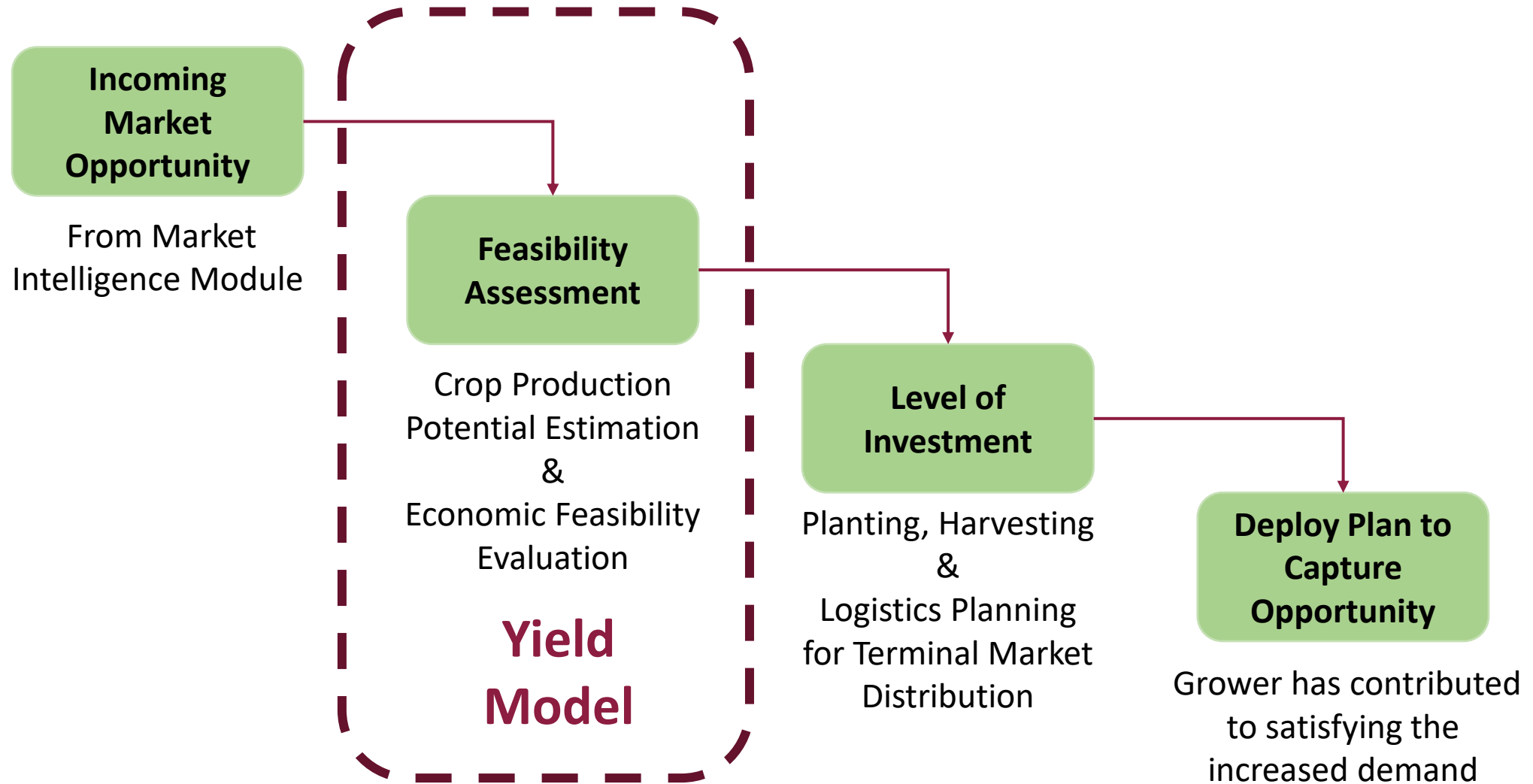
# Motivation

- Suppose a new Market Opportunity has been identified:
  - How can we assess if the growers in TERRa-Fresh are in an **advantageous position** to capture this opportunity?
  - How can we assess if it is **feasible** for us to invest in the planting and harvesting of a new crop?
  - How can we **quantify** the expected profits?

# Motivation

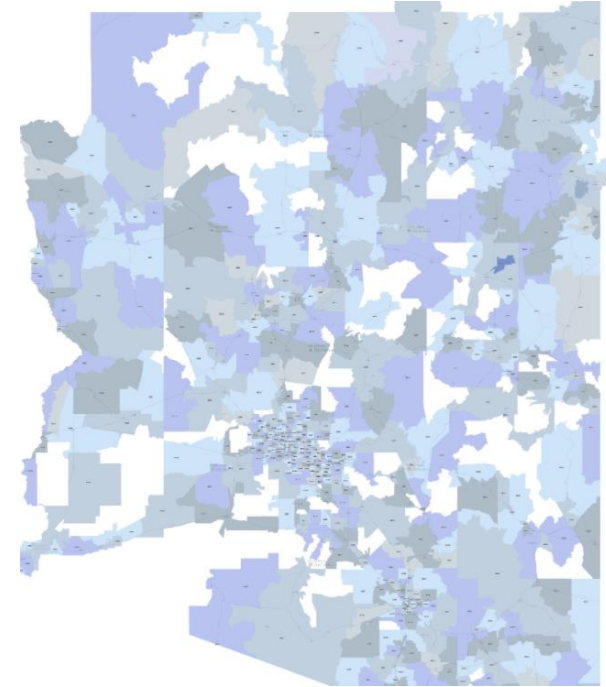


# Motivation



# Planning Units

- Homogenous planning units
  - 5-digit zip-code land partition
  - Facilitates the use of planning and allocation models
  - Makes possible the grouping of **similar** units (growers) for simplification of planning purposes



## How to group planning units?

Comparison of two planning units based on their **yield** for a certain crop using a **similarity measure**:

$$s = |Yield_1 - Yield_2|$$

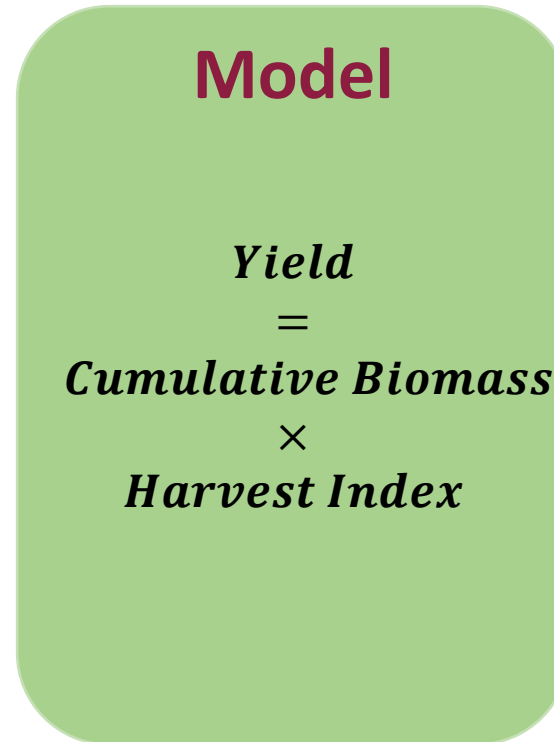
# Yield Model

- Decision support tool for **production estimation** and **economic feasibility** evaluation of introducing **new crops** in regions where they has not been harvested before
- Yield estimator for pre-defined 5-digit zip code planning units
- Serves as inputs to the optimization planning tools (*to be addressed shortly...*)
  - *Land Allocation Model*
  - *Contract Response Tools*

# Yield Model

- Crop
- Planting Week
- Radiation
- Humidity
- Temperatures
- Harvest Index
- Dry Matter
- Standard Yields

## Inputs



- Total Yield by zip-code
- Total Yield by zip-code disaggregation for each harvest week

## Outputs

*Note: Model Specifics are available in Appendix and can be reviewed in Q&A session*



# Planning Units Visualization

- Homogenous planning units can be aggregated into groups with similar expected yields
- Online demonstration:

<http://terra-fresh.com/>

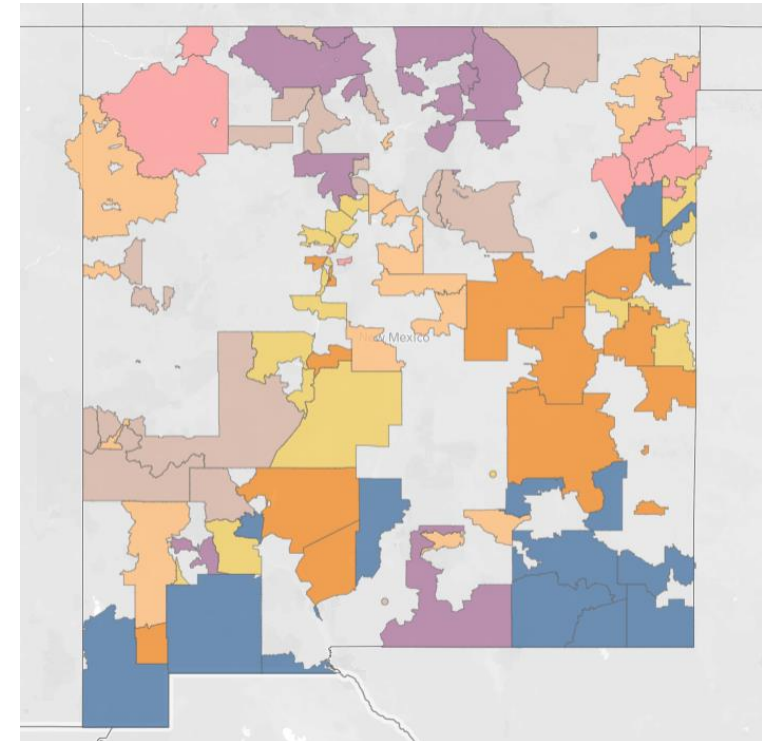



Figure: Grouped 5-digit zip codes in New Mexico based on Bell Pepper yields

# Potential Impact & Closing Remarks

- Development of a support tool for identifying potential investment opportunities on new crops.
- Facilitates decision making by providing economic feasibility assessments and estimated future yields for crops.
- Visualization tool for region aggregation based on yields, useful for comparison purposes between different regions.
- Aggregation of planning units simplifies crop planning, specially when serving as inputs for Optimization-based planning tool.

**T** **HANK** **Y** **OU**

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# Appendix

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