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## Fuzzy Cognitive Mapping Analysis: Farmer 11

Natalie Minton

*University of Mississippi. Community-First Research Center for Wellbeing and Creative Achievement*

Delta Food System Partnership

Mississippi Delta Council for Farm Worker Opportunities, Inc.

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Delta Food System Partnership  
Farmer 11

**Introduction**

This analysis for Farmer 11 is part of a larger research project for the Mississippi Delta Council for Farm Worker Opportunities, Inc. Farmer 11 is in an optimal position to maintain their farm's current state. Farmer 11 expressed an interest in expanding production into self-sustainable operations, which would theoretically allow Farmer 11 more time and less labor. The following variables are changed in this report's models to test their effects on farm production:

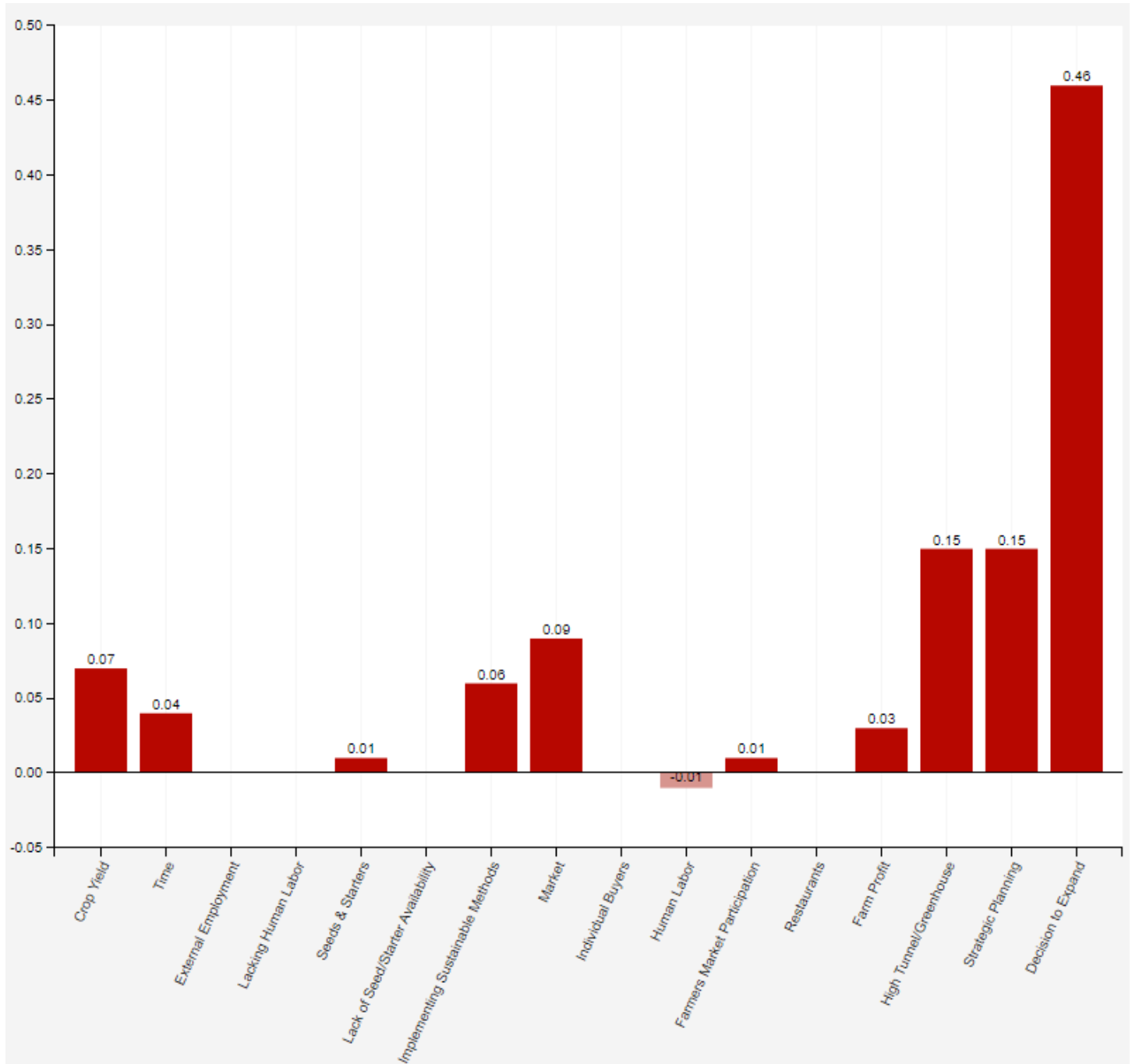
- Increase sustainability practices.
  - i.e. controlled burns, crop rotation, irrigation, land rests, high tunnel
- Hire one additional employee.
  - Full-time or part-time; each modeled provided
- Utilize more external resources
  - i.e. USDA programs, extension services, Alcorn State University, Mississippi Delta Council

Author interviewed Farmer 11 to gather the variables analyzed below and used Fuzzy Cognitive Mapping (FCM) to determine each variables' relationships. Each model listed in this report is based on the farm's current state from the farmer's perspective and reflects the predicted outcomes of each variable when one or two driving variables are changed.

It is important to note the data saturation level is extremely high, which has made each variable's impact on other variables very low. Small percentages mentioned throughout this report are a direct result of oversaturation. Because of this, the relationships are more important than specific values.

Continue to the next page to view suggestions and corresponding models.

## Utilize More External Resources

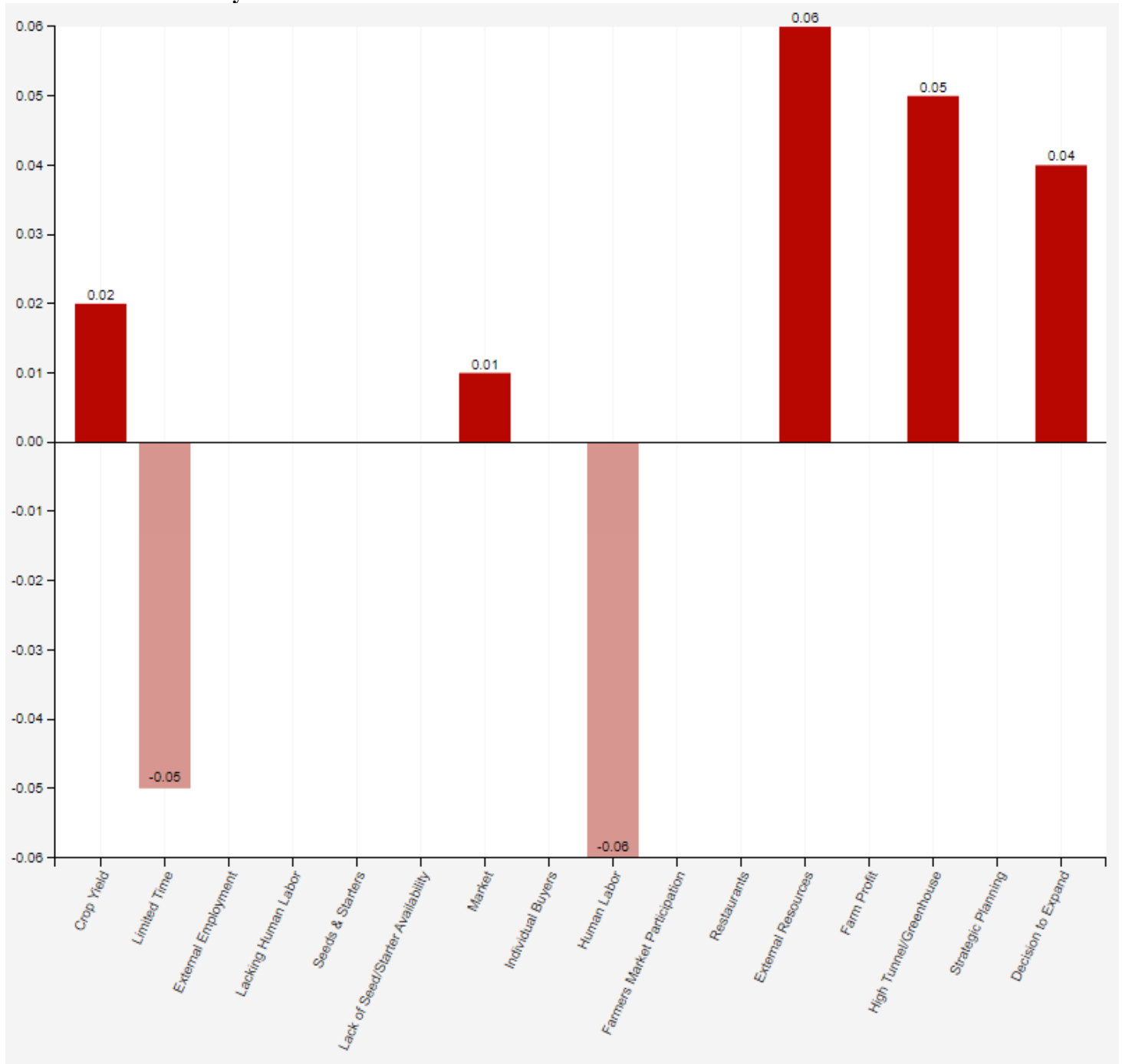


Increasing External Resources 100% (double) affects eleven other variables. The following are the most substantial changes:

- Decision to Expand increases 46%
- Strategic Planning increases 15%
- High Tunnel/Greenhouse (sustainable methods) increase 15%

If Farmer 11 doubles their external resources, Farmer 11 will likely be able to expand their farm by almost 50% while also increasing strategic planning capabilities and sustainability methods.

## Increase Sustainability Practices

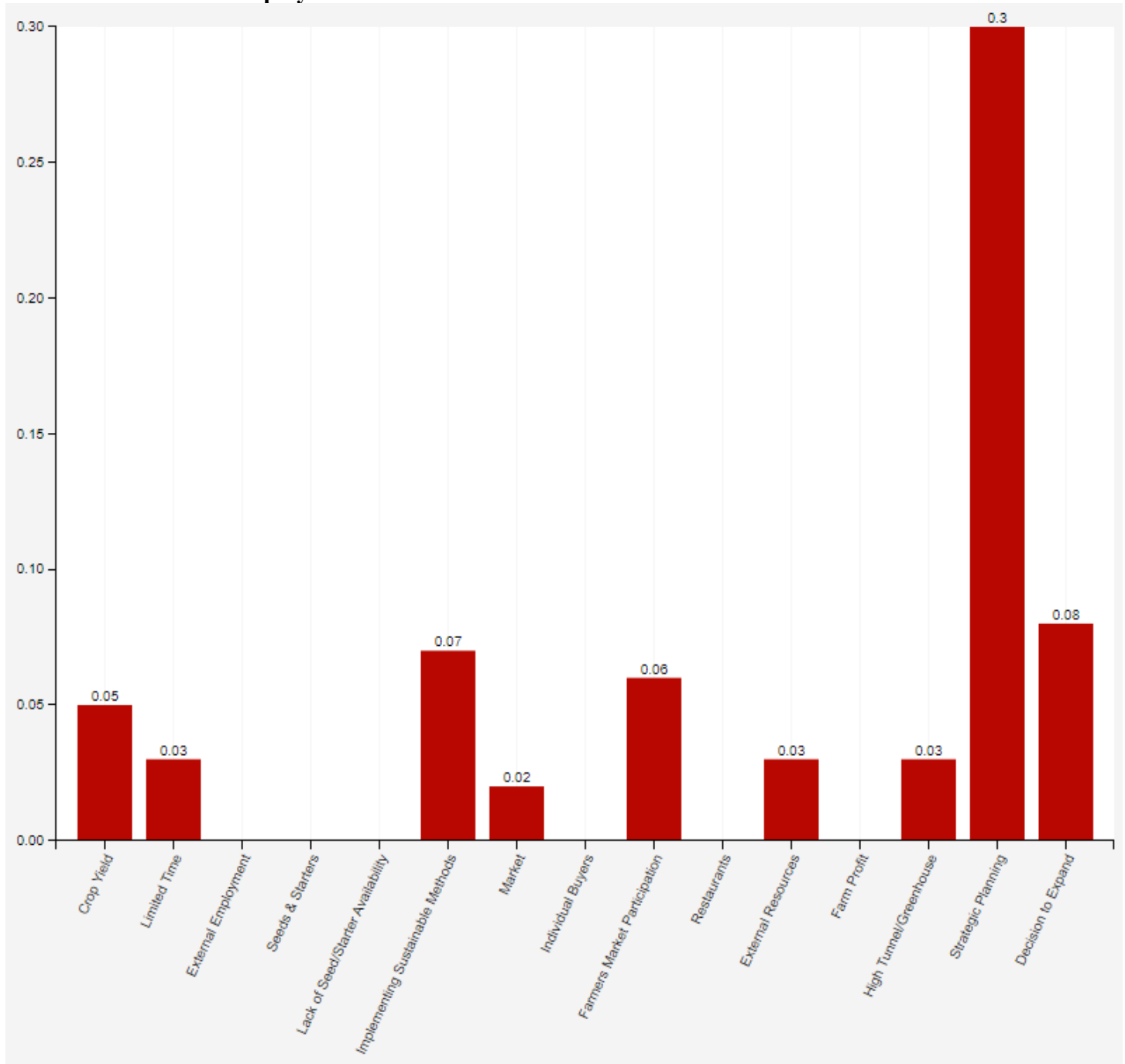


Increasing Sustainability Methods 100% (double) affects seven other variables. The following are the most substantial changes:

- Limited Time decreases 5%
- Human Labor decreases 6%
- Expansion increases 4%

If Farmer 11 doubles their current sustainability methods, Farmer 11 will likely gain back more time and can spend less of that time on farming. The improved sustainability in and of itself will likely contribute to the farm's long-term expansion.

## Hire One Part-Time Employee

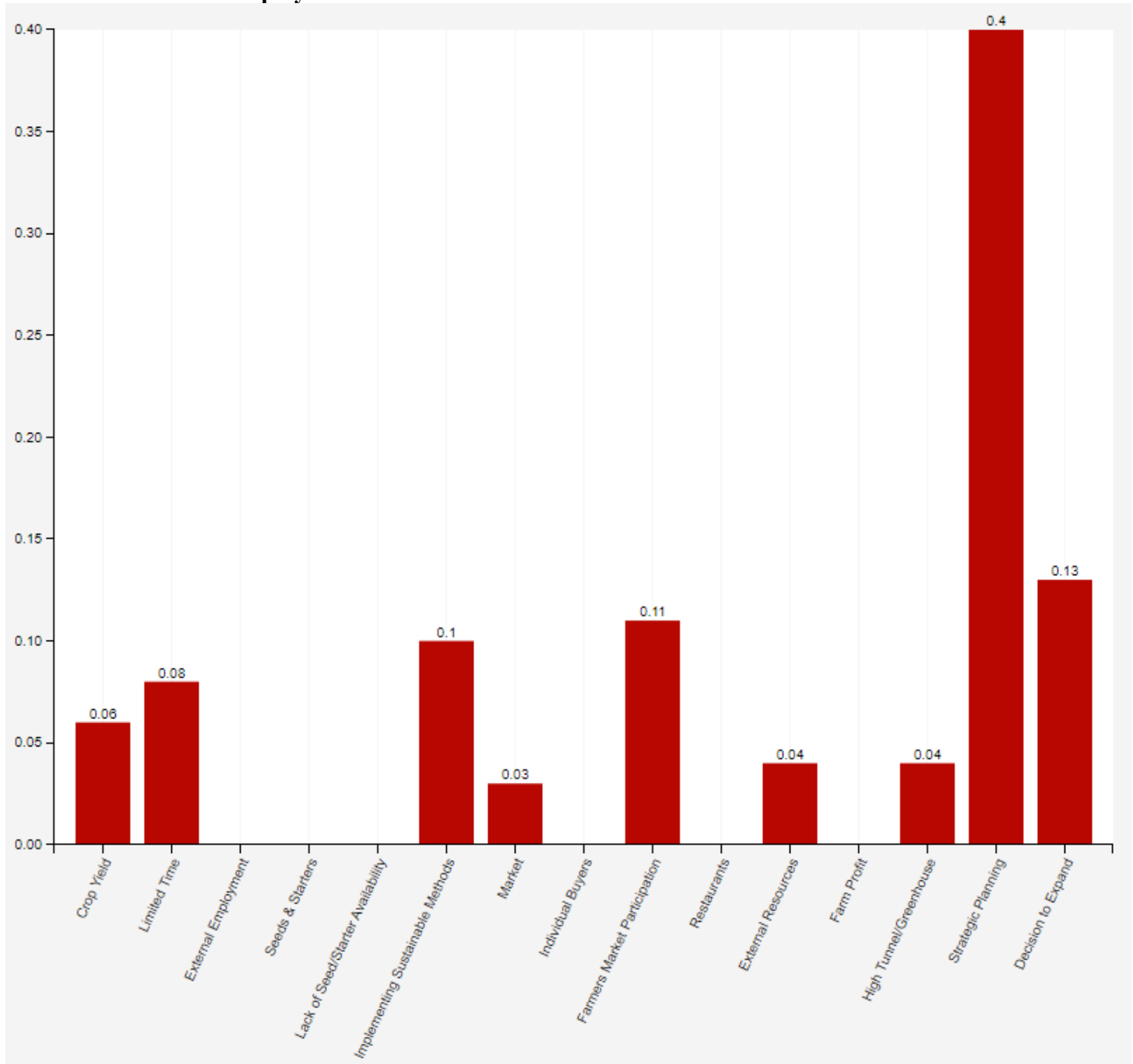


Increasing Human Labor 50% and decreasing Lacking Human Labor 50% affects nine variables. The following are the most substantial changes:

- Strategic Planning increases 30%
- Decision to Expand increases 8%
- Implementing Sustainable Methods increases 7%
- Farmers Market Participation increases 6%
- Crop Yield increases 5%

If Farmer 11 hires one part-time employee, farm expansion potential will likely increase significantly along with increased crop yield and the ability to sell to other markets.

## Hire One Full-Time Employee



Increasing Human Labor 100% and decreasing Lacking Human Labor 100% affects nine variables. The following are the most substantial changes:

- Strategic Planning increases 40%
- Decision to Expand increases 13%
- Implementing Sustainable Methods increases 10%
- Farmers Market Participation increases 11%
- Crop Yield increases 6%
- Limited Time increases 8%

If Farmer 11 hires one full-time employee, farm expansion potential will likely increase significantly along with increased crop yield and the ability to sell to other markets. However, Farmer 11's time becomes more limited. Hiring a part-time employee will likely be more beneficial considering Farmer 11's business and personal goals.

## **Conclusion**

Data oversaturation prevents these variables from showing their true relationships. These percentages are likely higher than shown above.

As previously thought, implementing more sustainable methods is the most viable option for decreasing human labor and increasing free time.

Utilizing more external resources will likely decrease human labor minimally, but will likely limit time even more than its current state. Hiring one person, part-time or full-time, will not likely decrease human labor for Farmer 11 and will likely limit time more than its current state.