

Getting Farmers Connected: BMPs and Social Networks

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Best Management Practices and Water Quality

Best Management Practices (BMPs) are farming practices that are implemented to slow down soil erosion, improve soil health, and stop excessive farm run-off. We surveyed farmers in the Red Cedar River Basin; this study captures 72 farmers' surveys and 152 total farmers in the network model. BMP usage and adoption was captured through our BMP Index. BMP Index measures percentage of how much BMP use different farmers are doing, dependent on what they farm (i.e. row crops, livestock).

How many BMPs can we predict a farmer would use?

Regression statistics for the effects of soil test frequency, closeness centrality, ecological impact, farmers feeling unfairly targeted, value of organic matter, and farm size on BMP Index.	
Soil Test Frequency	-7.215**
Closeness Centrality	5.821*
Ecological Impact	6.151*
Unfairly Targeted	-5.736
Value of Organic Matter	6.070*
Farm Size	0.007
R ²	0.436
df	6

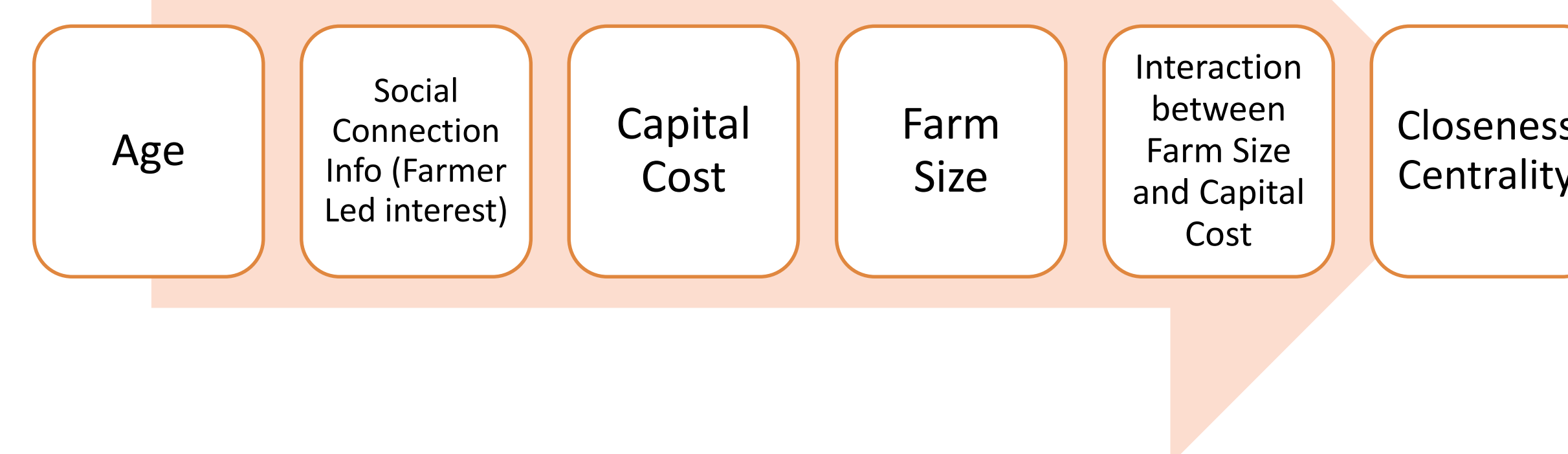
*p<.1; **p<.05; ***p<.01, two tailed tests

Closeness Centrality Regression Model

Closeness centrality, a predictor of farmer BMP use, measures the nodes well connected to many others yet have relatively few who are directly connected to them in the network.

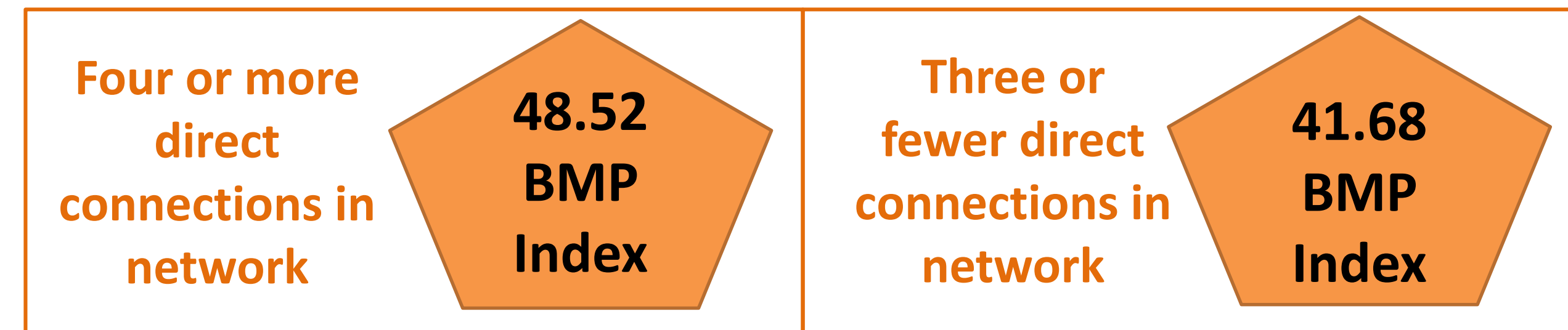
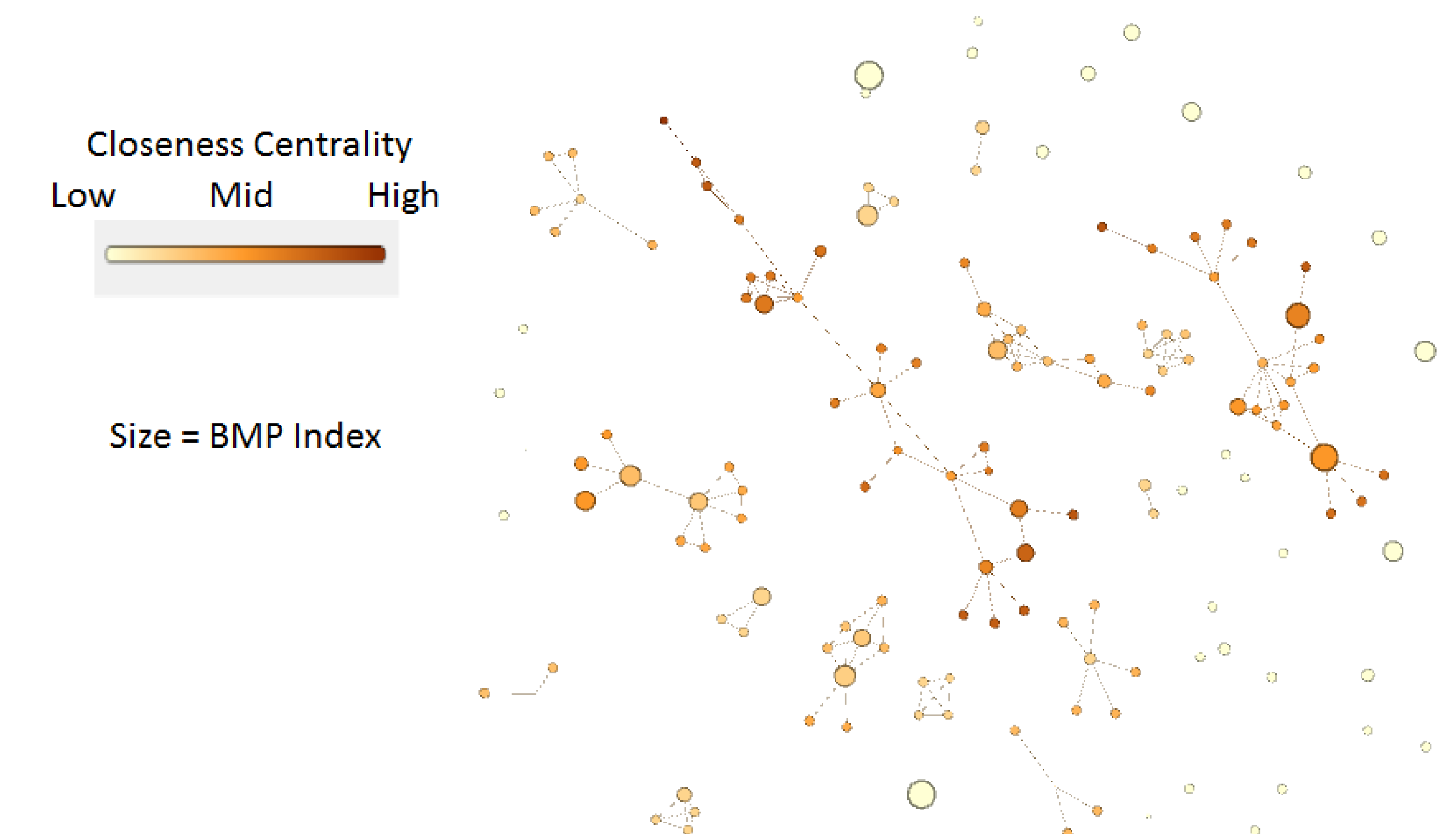
Regression statistics for effects of age, desire for social connections like Farmer Led Councils, capital cost's hindrance or support of BMP adoption, farm size, and an interaction between farm size and capital cost on closeness centrality.	
Age	-0.066***
Social Connection Info	-0.448**
Capital Cost	1.152***
Farm Size	0.744**
Interaction Farm Size Capital Cost	-0.269**
R ²	0.673
df	5

*p<.1; **p<.05; ***p<.01, two tailed tests



Social Network Analysis of Farmers

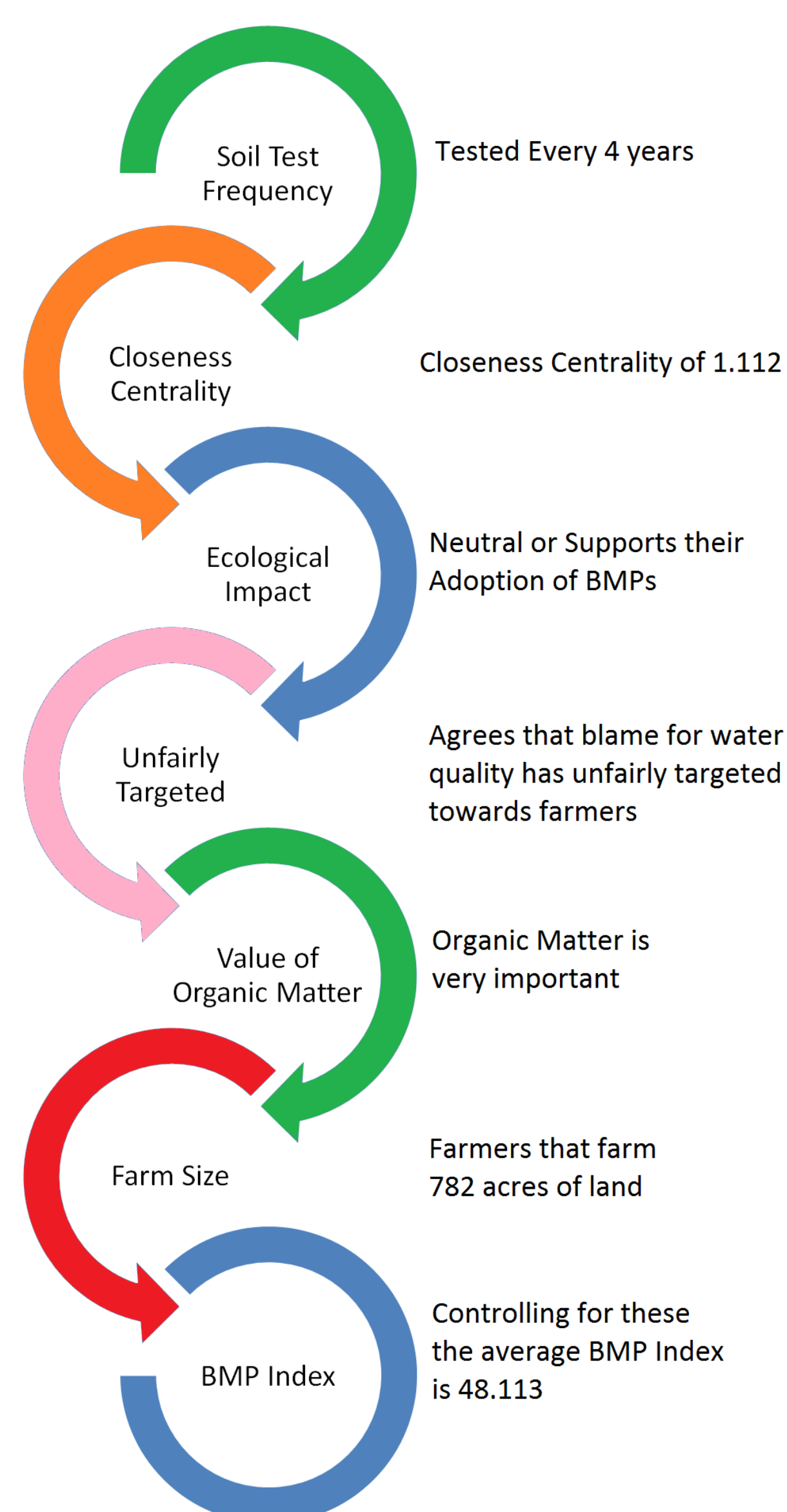
Farmers can still be connected to a network of only a few people, but have access to a large amount of information.



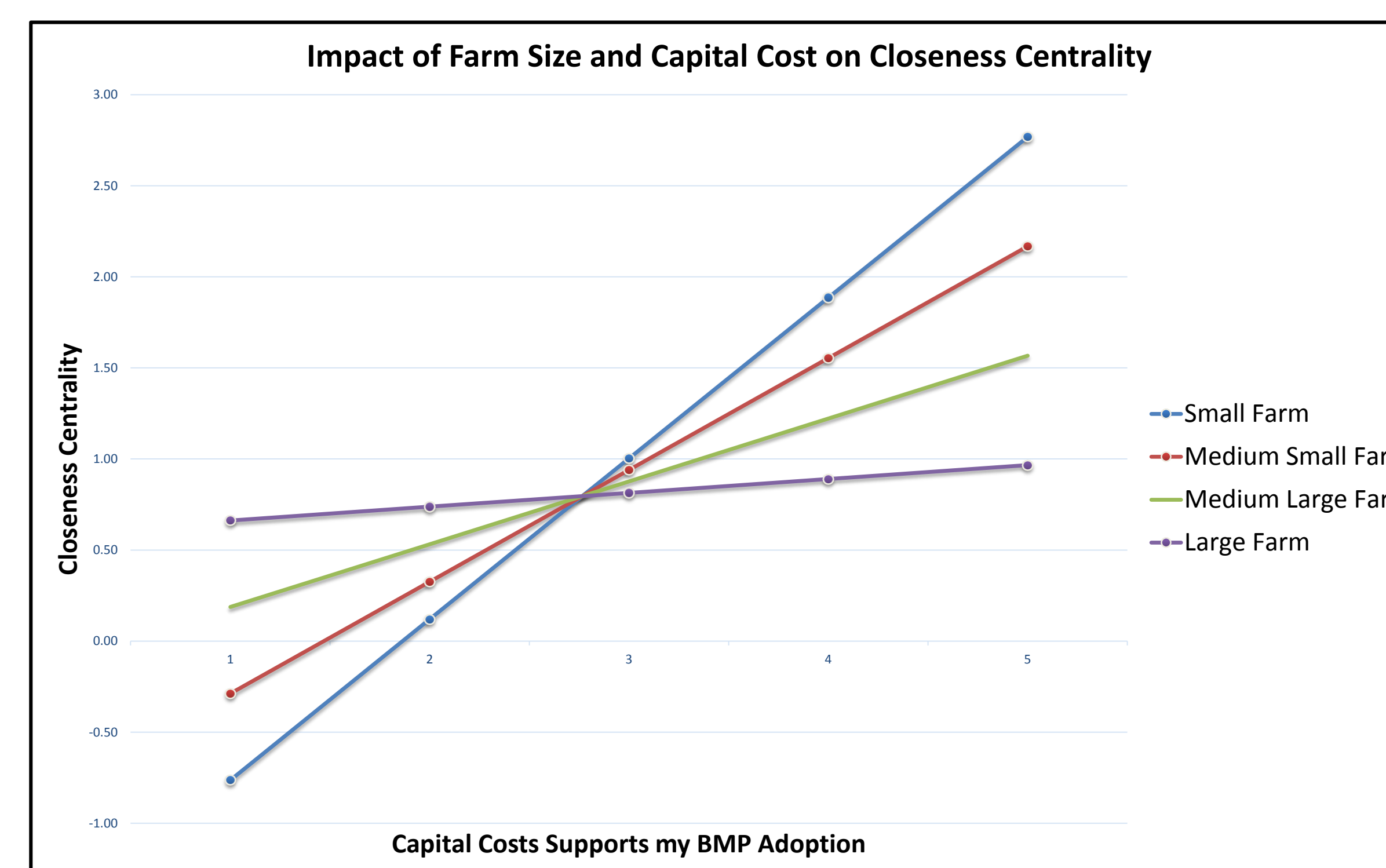
When farmers are connected to four other people or higher they have a seven point higher average BMP Index than farmers with three or fewer connections.

Average farmer responses

So what?



- Incentivizing farm land soil testing could increase the soil test frequency
- Closeness centrality can be increased by getting farmers included in farming networks
- More awareness about the ecological impact and BMPs
- Include farmers in conversations about water quality
- Show farmers the importance of organic matter in their fields for soil health
- Larger farms tend to generate more income and can afford BMP adoption



Interaction between Farm Size and Capital Costs

- In order to improve a small farmer's connection to the network then they likely must **not** see capital costs as a hindrance.
- Perhaps the best way to include small farmers into the network, thus improving their BMP adoption, is to lower their capital costs.
- This matters much less for large farms.

Discussion and Take Away Points

- The use of BMPs is the best way to stop phosphorous from entering the lakes rivers and streams and decreasing soil erosion. Land owners must discover how to work with their land to make adoption work well.
- Farmers are more willing to meet with farmers compared to government agencies or conservationists to explore BMP adoptions.
- The size and income of farms is important. Small farms have more difficulty being able to afford the implementation of some BMPs because the capital costs are more challenging for them. The smaller farmers perhaps are best to include in Farmer-Led Councils in order to expand their social network for farming advice.
- People within a network have more BMPs than those that are outside of a network. Helping to integrate farmers into a local farming network is important. This includes using Farmer-Led Councils or other, similar efforts.