

# Predisposition for Conservation Agriculture in North West Ghana

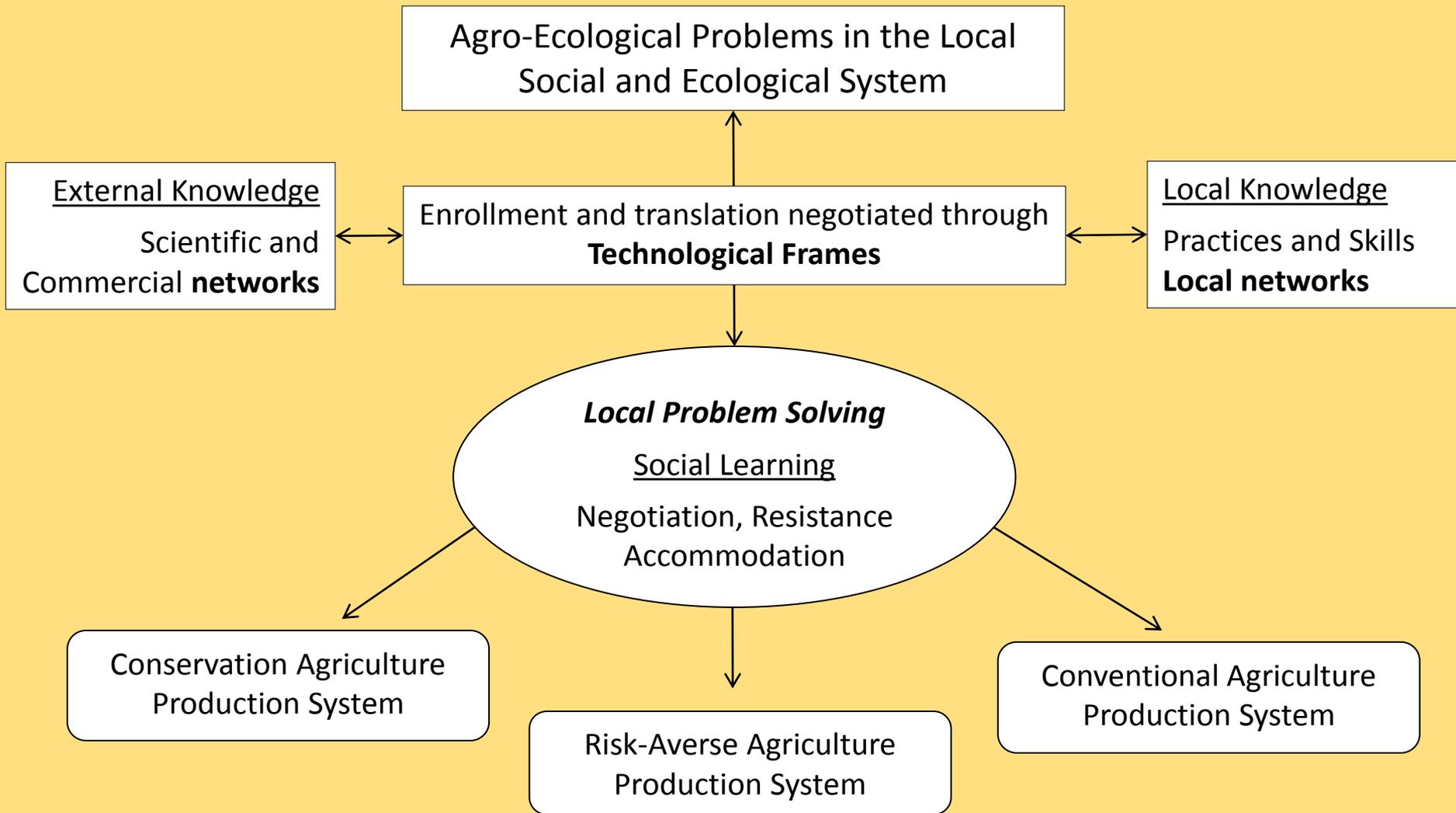
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**Sustainable Agriculture and Natural Resource Management  
Collaborative Research Support Program**



# Technology Networks:

The movement and processing of knowledge and innovation



# Technological Frames:

## Conventional Agriculture:

- Plowing for land preparation/weeding
- Focus on profit/yield maximization
- Market integration/commodity specialization
- Use of modern inputs

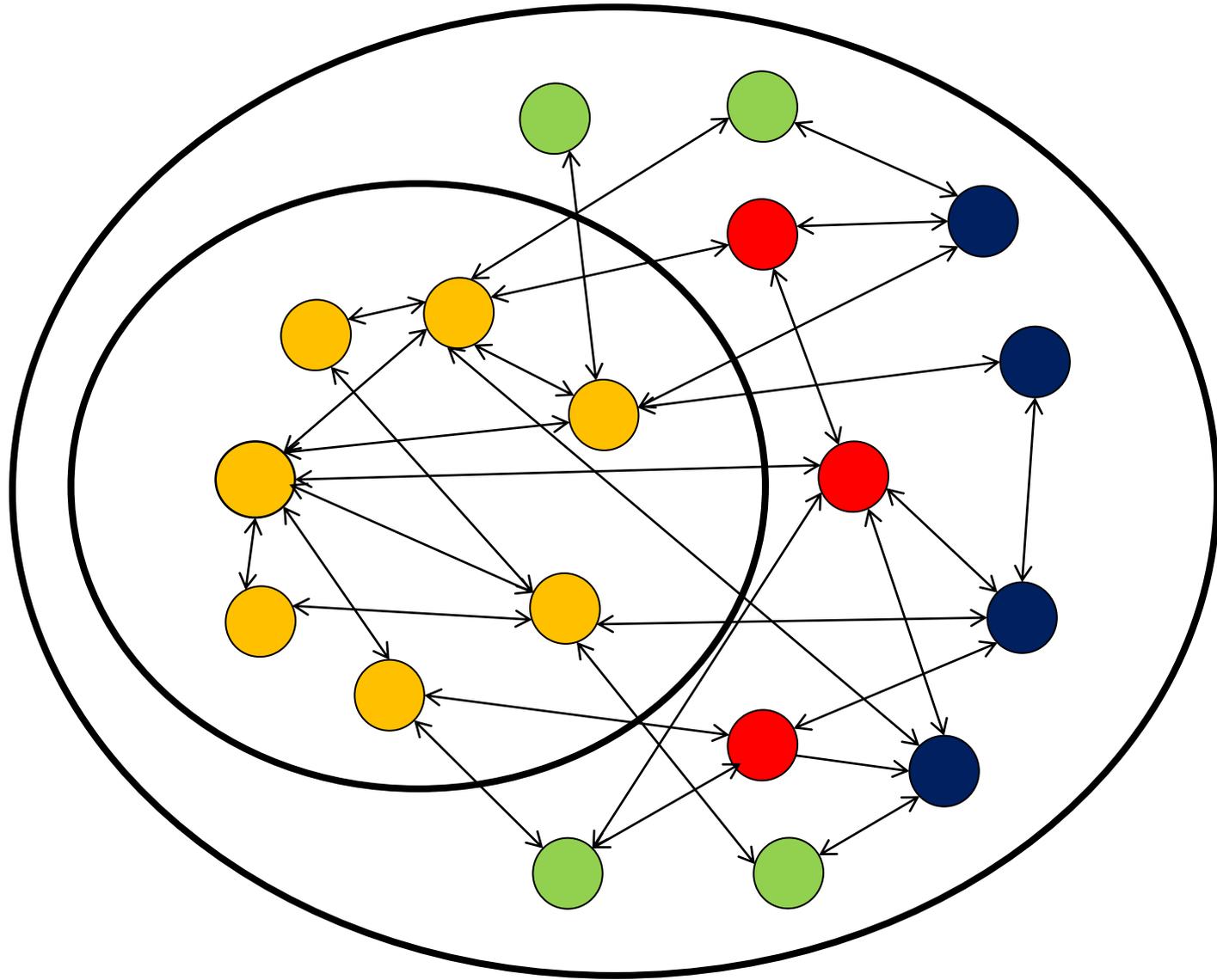
## Risk-averse Agriculture:

- Avoidance of dependence on market
- Few purchased inputs
- Food security in terms of staple crop production
- Diversified production system

## Conservation Agriculture:

- Minimum soil disturbance
- Permanent vegetative cover
- Crop rotations

# A local network with supporting actors



# Technological frame items factored for men and women farmers

1. Land is one's heritage to be preserved for future generations
2. Farm labor should be replaced by more efficient herbicides and machines
3. Engaging in multiple productive activities is always better than doing just one
4. Farm income should always be reinvested to grow the business
5. One should maintain a permanent crop cover
6. It is better to grow staples within the household or community than purchase them
7. Applying chemical pesticides is always necessary
8. Farm production is necessary to feed the family
9. Inorganic fertilizer is best to improve soil quality
10. Spreading crops and inputs across multiple plots is always necessary
11. Planting decisions are always based on current market prices
12. Timely weeding (before setting of seed) is important to a successful harvest
13. Crops should only be grown for sale
14. Crop residues should only be fed to livestock and poultry
15. Tillage causes land degradation
16. One should always strive to grow the most on one's land
17. The staple crop should be planted on the majority of the land *every* growing season
18. Rotating crops is always best practice
19. Land preparation for crop production begins with plowing
20. Earning off-farm income is more important than a large harvest

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# Technological frame hypotheses

These measures of local technological frames were examined with respect to the following hypotheses:

1. Farmers (both men and women) who have a higher level of contact with extension agents for information and inputs will hold strong **conventional agriculture** perspectives.
2. Farmers (both men and women) who have few or no contacts with extension agents for information and inputs will hold strong **risk averse** perspectives.
3. Women farmers are more likely to hold **conservation agriculture** perspectives than men farmers, regardless of extension agent contact.

# Examination of shared understandings of agricultural production

## Technological frame items factored for **men** farmers

### ***Farming is a capital intensive business (conventional)***

- Farm income should always be reinvested to grow the business
- Applying chemical pesticides is always necessary
- Inorganic fertilizer is best to improve soil quality
- Planting decisions are always based on current market prices

### ***Farming requires interdependent staple crops and livestock (risk averse)***

- Crop residues should only be fed to livestock and poultry
- The staple crop should be planted on the majority of the land *every* growing season

### ***Extensive diversification of crop production is important***

- Spreading crops and inputs across multiple plots is always necessary
- One should always strive to grow the most on one's land.

### ***Market participation is necessary for sustainable farming***

- Farm production is necessary to feed the family
- Crops should only be grown for sale

# Examination of shared understandings of agricultural production

## Technological frame items factored for **women** farmers

### ***Farming requires growing staple crops and feeding livestock (risk averse)***

- Crop residues should only be fed to livestock and poultry
- One should always strive to grow the most on one's land
- The staple crop should be planted on the majority of the land *every* growing season

### ***Local food security is important (risk averse)***

- It is better to grow staples within the household or community than purchase them
- Farm production is necessary to feed the family

### ***Technological innovation is important for agriculture (conventional)***

- Farm labor should be replaced by more efficient herbicides and machines
- Inorganic fertilizer is best to improve soil quality

### ***Farming is a cash-cropping business (conventional)***

- Farm income should always be reinvested to grow the business
- Planting decisions are always based off of current market prices

## Examination of Shared Understandings of Agricultural Production in Northern Ghana

**Table 1:**  
**Mean factor scores for men's agricultural  
 production orientations according to their:**

	Contact with extension agents		
	Men		
	No Contact	Contact with one agent	Contact with more than one agent
Farming is a capital intensive business *	3.6 <sup>a</sup>	3.7 <sup>a</sup>	3.4 <sup>a</sup>
Farming requires interdependent staple crops and livestock**	3.4 <sup>a</sup>	3.0 <sup>b</sup>	4.1 <sup>a</sup>
Extensive diversification of crop production is important *	3.3 <sup>a</sup>	3.5 <sup>a</sup>	3.2 <sup>a</sup>
Market participation is necessary for sustainable farming *	3.1 <sup>a</sup>	3.1 <sup>a</sup>	3.4 <sup>a</sup>
N	106	81	13

Note: Different letters within the same row are statistically different. Rows marked by \* signify that scores are significantly different at the .05 level; \*\* signifies the .01 level.

Composite scores measured on a scale from 1 to 5, with higher scores signifying agreement with the technological frame concept.

## Examination of Shared Understandings of Agricultural Production in Northern Ghana

**Table 2:**  
**Mean factor scores for women's agricultural production orientations according to their:**

**Contact with extension agents**

**Women**

**No Contacts**

**Contact with at least one agent**

**Farming requires growing staple crops and feeding livestock\***

3.2<sup>a</sup>

3.5<sup>a</sup>

**Local food security is important\***

4.1<sup>a</sup>

4.1<sup>a</sup>

**Technological innovation is important for agriculture\***

3.9<sup>a</sup>

4.0<sup>a</sup>

**Farming is a cash-cropping business\***

3.5<sup>a</sup>

3.9<sup>b</sup>

**N**

128

29

Note: Different letters within the same row are statistically different at the .05 level. Composite scores measured on a scale from 1 to 5, with higher scores signifying agreement with the technological frame concept.

## Examination of Shared Understandings of Agricultural Production in Northern Ghana

**Table 3:**  
**Comparison of mean scores**  
**for farm men and women's agreement**  
**with CA principles**

**Gender**

	<b>Farm Men</b>	<b>Farm Women</b>
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**One should maintain a permanent crop cover\***

2.7<sup>a</sup>

2.6<sup>a</sup>

**Tillage causes land degradation\***

3.1<sup>a</sup>

3.1<sup>a</sup>

**Rotating crops is always best practice\***

4.2<sup>a</sup>

4.1<sup>a</sup>

**N**

200

157

Note: Different letters within the same row are statistically different at the .05 level. Scores measured on a scale from 1 to 5, with higher scores signifying agreement with the concept.

## Examination of Shared Understandings of Agricultural Production in Northern Ghana

**Table 4:**  
**Mean factor scores for men's agricultural production orientations according to their belief that:**

	Tillage causes land degradation		
	Men		
	Agree	Neutral	Disagree
Farming is a capital intensive business*	3.5 <sup>a</sup>	3.5 <sup>a</sup>	3.8 <sup>b</sup>
Farming requires interdependent staple crops and livestock**	3.6 <sup>a</sup>	3.5 <sup>a</sup>	2.9 <sup>b</sup>
Extensive diversification of crop production is important*	3.6 <sup>a</sup>	3.0 <sup>b</sup>	3.3 <sup>ab</sup>
Market participation is necessary for sustainable farming**	3.3 <sup>a</sup>	2.9 <sup>b</sup>	3.0 <sup>b</sup>
N	83	33	84

Note: Different letters within the same row are statistically different. Rows marked by \* signify that scores are significantly different at the .05 level; \*\* signifies the .01 level. Composite scores measured on a scale from 1 to 5, with higher scores signifying agreement with the technological frame concept.

## Examination of Shared Understandings of Agricultural Production in Northern Ghana

**Table 5:**  
**Mean factor scores for women's agricultural production orientations according to their belief that:**

	Tillage causes land degradation		
	Women		
	Agree	Neutral	Disagree
Farming requires growing staple crops and feeding livestock**	3.6 <sup>a</sup>	2.8 <sup>b</sup>	3.1 <sup>b</sup>
Local food security is important*	4.1 <sup>a</sup>	4.0 <sup>a</sup>	4.2 <sup>a</sup>
Technological innovation is important for agriculture**	3.7 <sup>a</sup>	3.8 <sup>ab</sup>	4.1 <sup>b</sup>
Farming is a cash-cropping business*	3.4 <sup>a</sup>	3.5 <sup>ab</sup>	3.8 <sup>b</sup>
N	66	29	62

Note: Different letters within the same row are statistically different. Rows marked by \* signifies that scores are significantly different at the .05 level; \*\* signifies the .01 level. Composite scores measured on a scale from 1 to 5, with higher scores signifying agreement with the technological frame concept.

# Findings

## **1. The first two hypotheses have not been confirmed.**

Extension agents seem to have little influence on the technological frame perspectives (conventional or risk averse) in North West Ghana.

## **2. The third hypothesis is not supported either.**

There is no convergence on the three conservation agriculture principles among either men or women, consequently neither men nor women can be considered more likely to hold CA perspectives.

Furthermore, farm men and women are both about equally divided on the issue of whether “tillage causes land degradation.”

## **3. However, there appears to be a significant group of risk averse farm men and women that believe “tillage causes land degradation”.**

These farmers would be most amenable to a mindset change to the ideas of conservation agriculture.