

# LOCAL INSTITUTIONS' ROLE IN ENHANCING CLIMATE CHANGE ADAPTATION OF RURAL FARMERS IN SEMI-ARID ECOSYSTEMS IN NORTHERN GHANA USING SOCIAL NETWORK ANALYSIS

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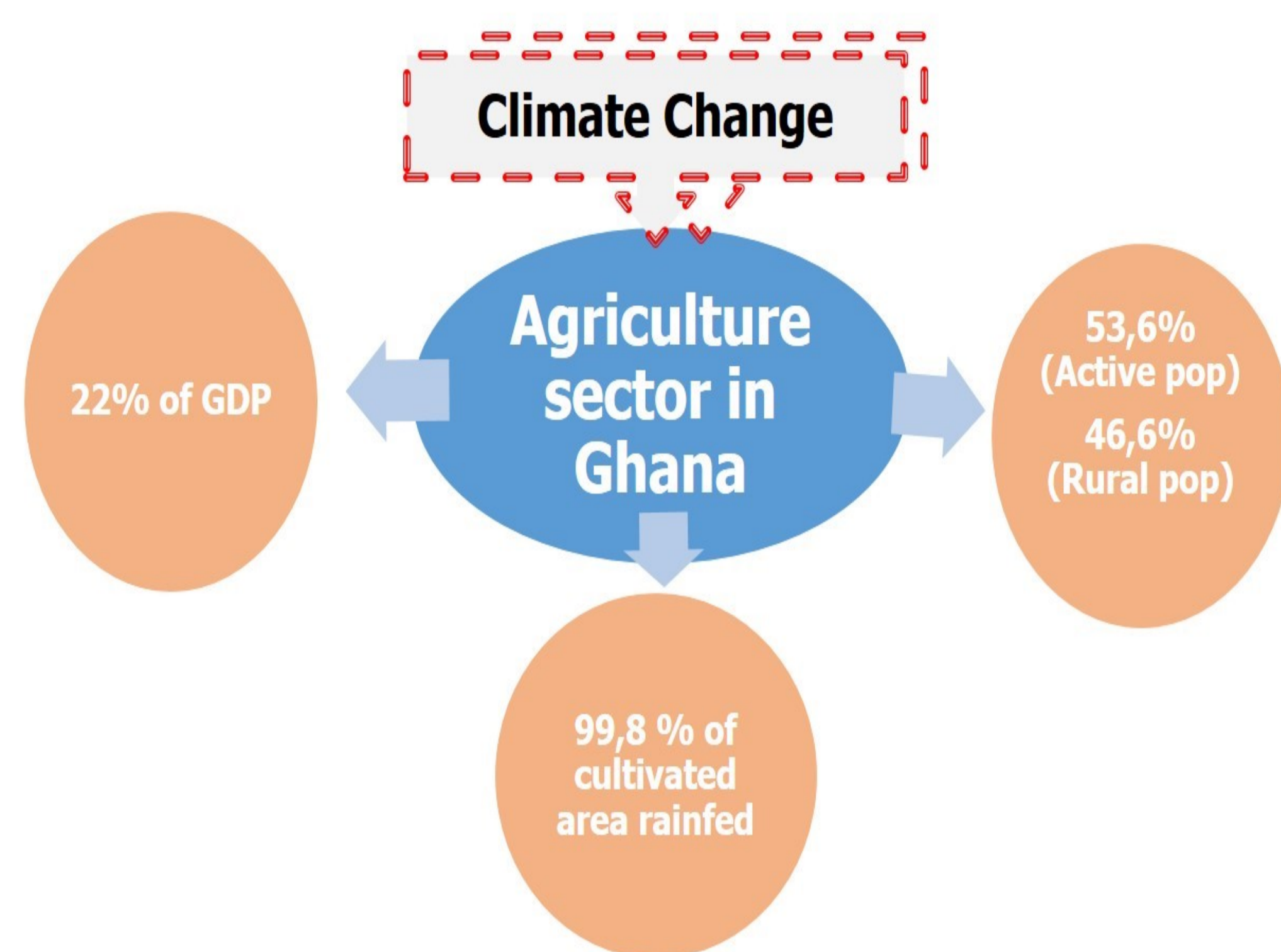
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## INTRODUCTION

### Background



### Problem statement

⇒ Bongo district is reported to have the most vulnerable crop production (for main crop such as sorghum and millet) to drought in Ghana (Antwi-Agyei, 2015) and subjected to the changes in the climate (EPA, 2007; GSS, 2012).

⇒ Several studies (Adger et al., 2003; Parry, 2009) highlighted the insufficient character of rural communities' local strategies in dealing with medium to long-term impacts of climate change.

⇒ Local institutions have helped rural communities in responding to environmental changes in the past (Agrawal, 2008).

Therefore, there is a need to assess the role the existing local institutions in enhancing farm household ability to respond to the current changes in the climate.

### Objectives

In general this paper aim at assessing the role of local institutions in enhancing climate change adaptation capacity of rural farmers in Semi-arid ecosystems in Northern Ghana

⇒ Assessing the adaptation options availed by existing local institutions (support)

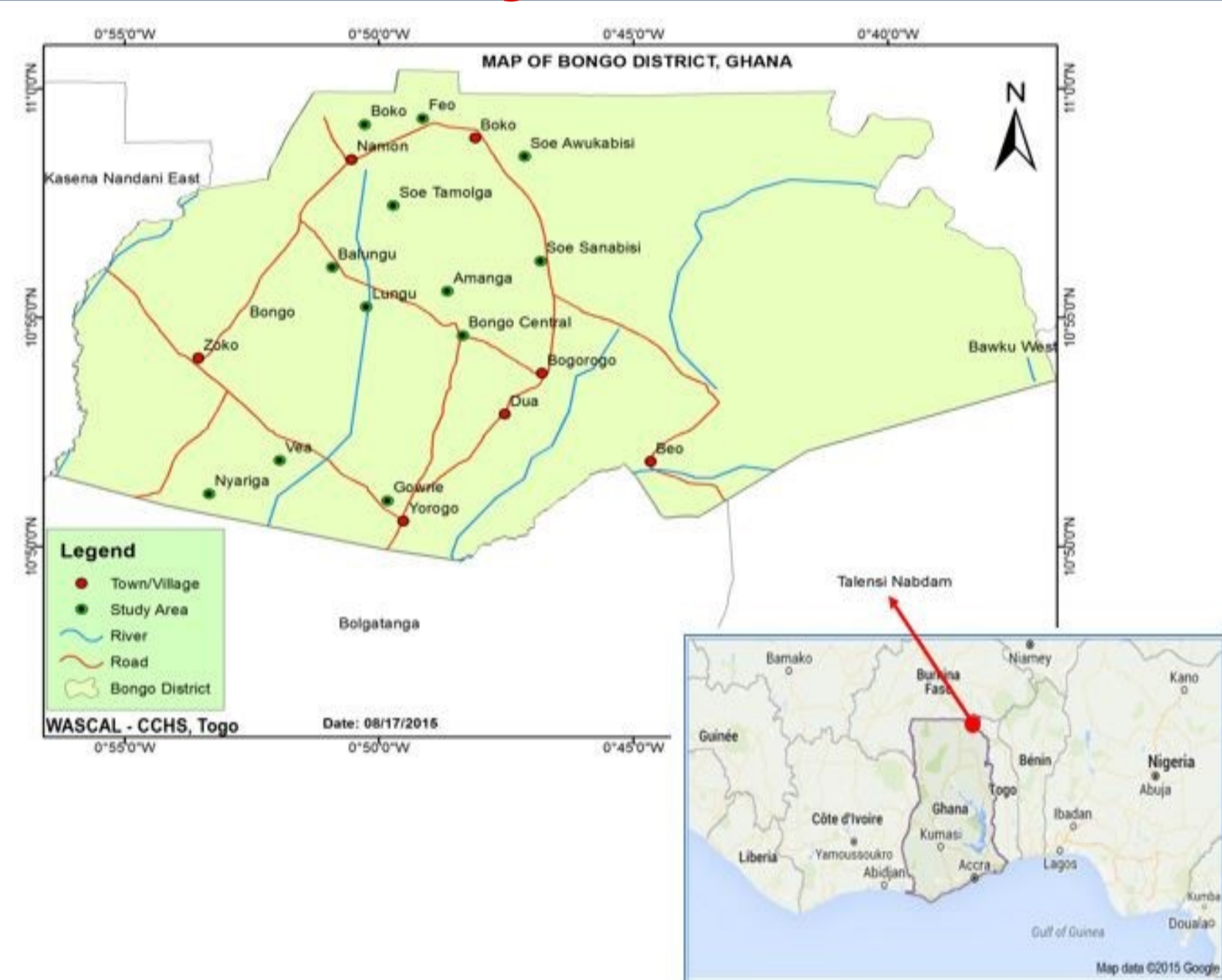
⇒ Assessing institutional accessibility

⇒ Assessing farm households livelihood outcome

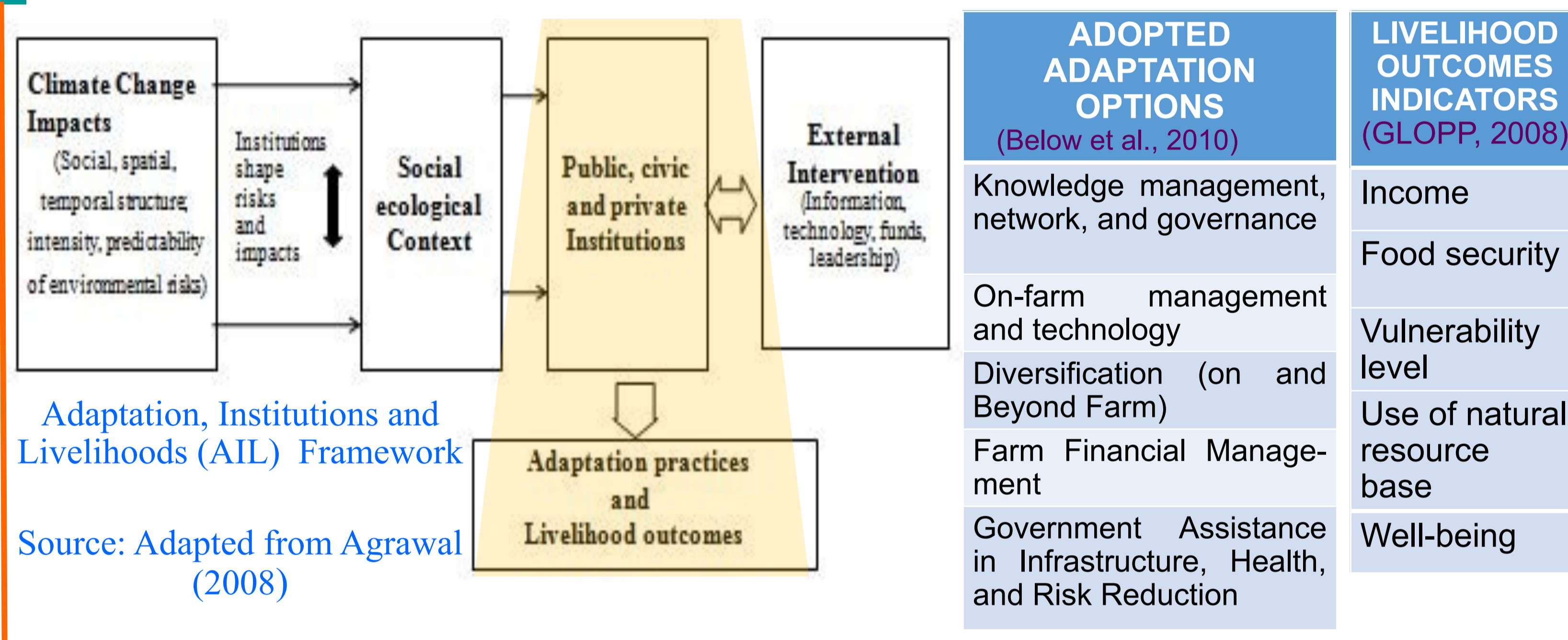
⇒ Classifying local institutions based on their role in adaptation

## METHODOLOGY

### Study area



### Framework



### Data analysis

- Network Visualization Software or Net DRAW
  - An institution is considered as core when its degree centrality score is greater or equal to 6
  - An institution is considered as bridge when its closeness centrality score is greater or equal to 90
  - An institution is considered as resources controller or mediators when its betweenness centrality score is greater or equal to 19.40
- SPSS (16.0) for descriptive statistics
  - Adaptation options based of Below et al. (2010) classification
  - Farm households Livelihood outcomes are organized based on GLOPP (2008)

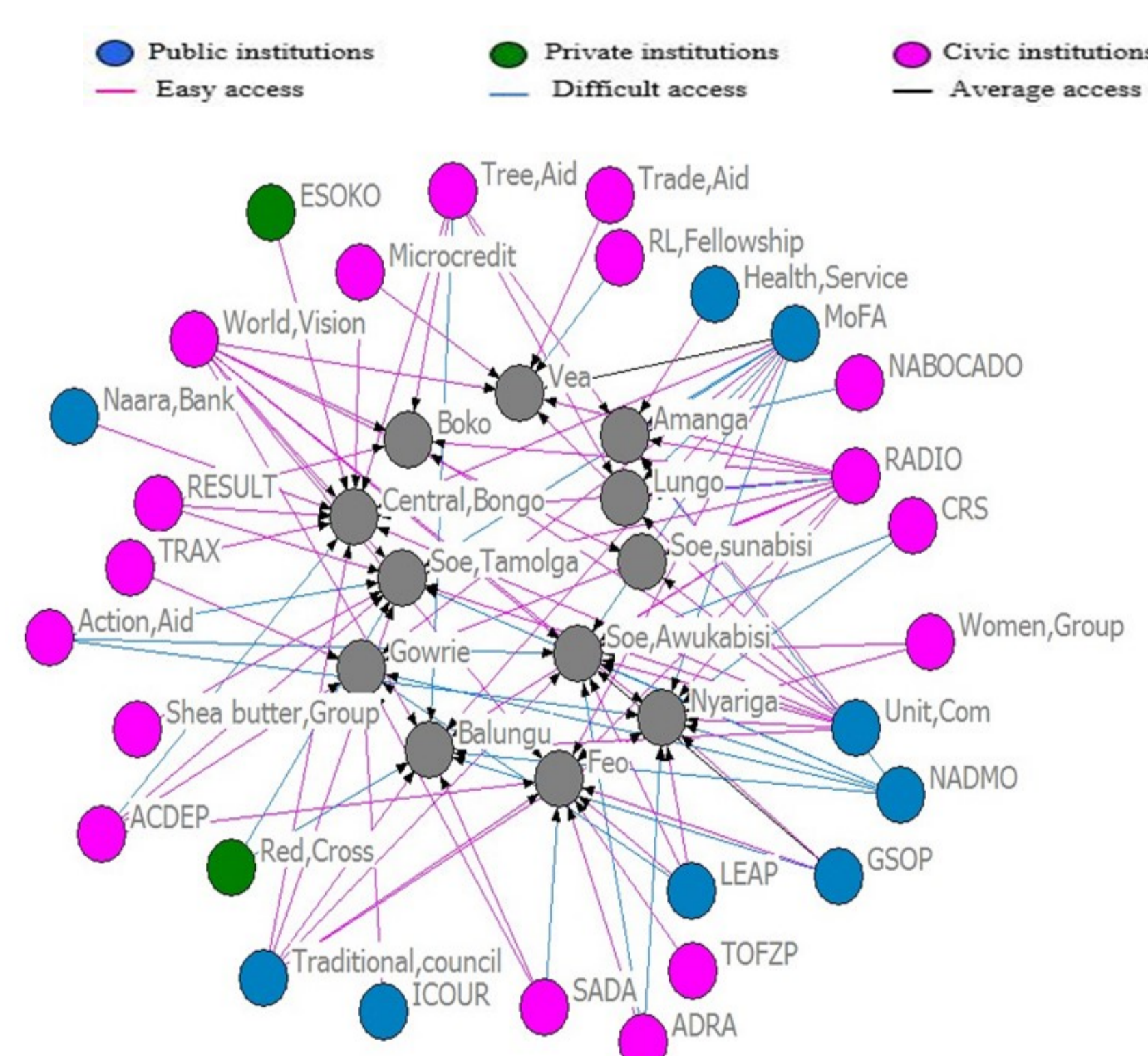
## RESULTS

### Institutional support

Key intervention	Activities	Institution involved
<b>Knowledge management, network, and governance</b>	<ul style="list-style-type: none"> <li>Education and trainings (57%)</li> <li>Awareness raising (29%)</li> <li>Provision of climate and weather information (14%)</li> </ul>	Civic, public and private institutions: MoFA, Radio, Esoko
<b>On-farm management and technology</b>	<ul style="list-style-type: none"> <li>Reduction of post-harvest losses (through storage bags and bins) (43%)</li> <li>Supply of improved crop varieties (23%)</li> <li>Soil and water management (through farming tools, fertilizer, pesticide) (23%)</li> </ul>	Civic and public institutions: MoFA, ICOUR, ACDEP, World Vision
<b>Diversification (on and Beyond Farm)</b>	<ul style="list-style-type: none"> <li>On-farm diversification (e.g., extraction of non-timber product such as honey, Dawadawa powder and oil) (14%)</li> <li>Off-farm diversification (includes animal rearing, petty trade, aquaculture, and basket weaving and soap production) (86%)</li> </ul>	Civic and public Institutions: World Vision, RESULT, ACDEP, Community Self-Reliance Center, and Trax-support, NADMO
<b>Farm Financial Management</b>	<ul style="list-style-type: none"> <li>Credit provision (54%)</li> <li>Improvement of the access to market (36%)</li> <li>Provision of insurance scheme (9%)</li> </ul>	Civic and Public institutions: Financial institutions (Naara rural bank and Bongo rural bank), insurance companies (AR promising), ICOUR, Trade aid, and RESULT
<b>Government Assistance in Infrastructure, Health, and Risk Reduction</b>	<ul style="list-style-type: none"> <li>Infrastructure development (Road: Balungo-Gorigo, Gorigo-Tambulgo, Balungo-Soe, Apuwongo-Dua, Go kadare, Go akasarga and Apuwongo; and Dugouts)</li> <li>Infrastructure rehabilitation (Kansoe dam, Adaboya dam, Gambulgu dam, Feo dam, Go dam and Akasarga dam)</li> <li>Intervention in public health (vaccine and health care)</li> </ul>	Public and civic institutions: GSOP (Bongo district assembly, ICOUR, Tree Aid

### Institutional accessibility

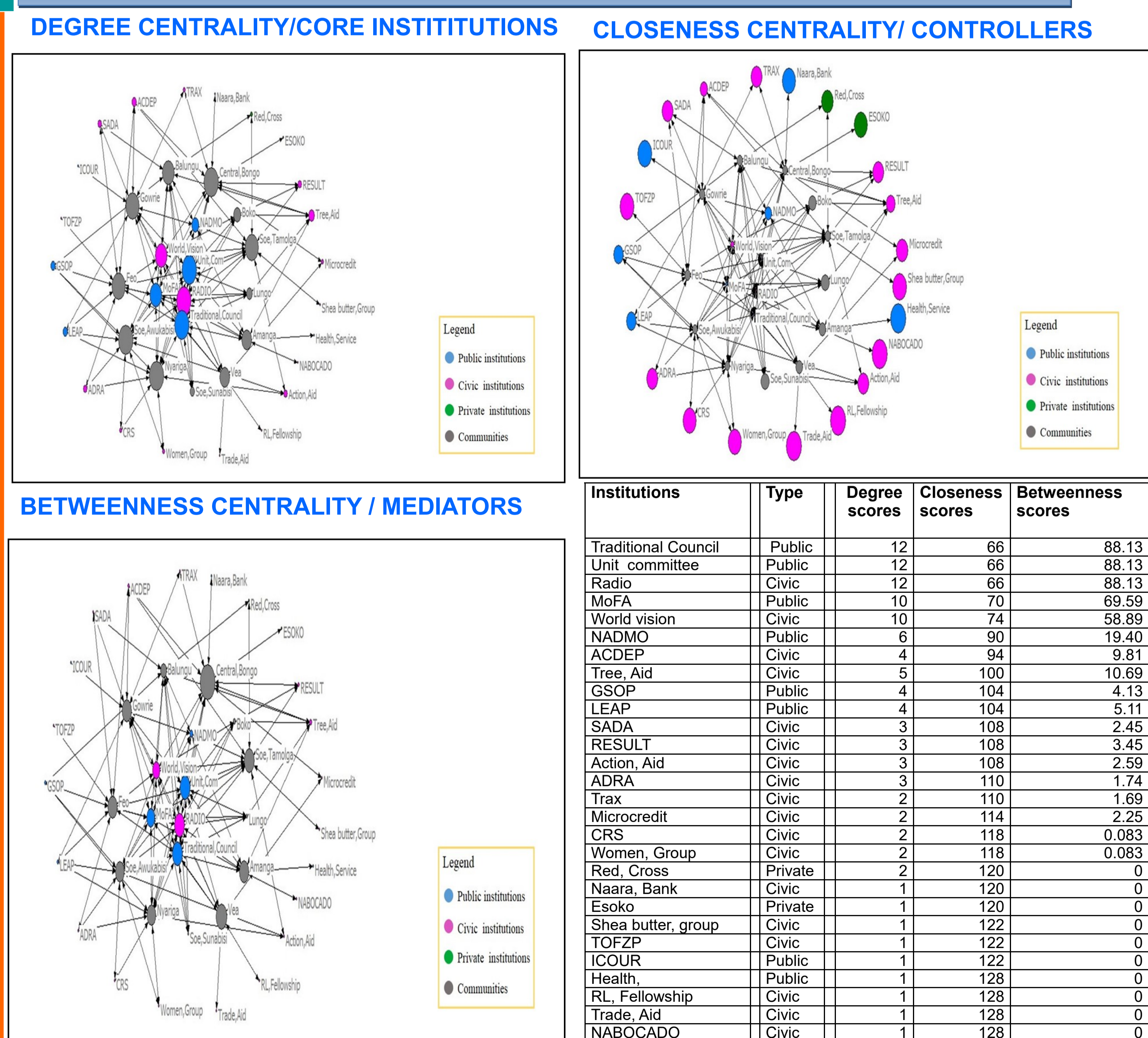
- 96% of farm households' respondents have access to local institutions.
- Farm households' access to local institutions goes from their participation in meetings to participation in decision making



### Farm households' livelihood outcomes

Indicators	Livelihood outcomes	Actions undertaken
<b>Farm households' Income</b>	Increase in households' income (88%)	Introduction of alternative livelihood: aquaculture, the extraction of non-timber forest product animal rearing, petty trade and basket weaving.
<b>Farm productivity</b>	Increase in farm productivity (85%)	<ul style="list-style-type: none"> <li>Technical support and agricultural advice</li> <li>Provision of farm inputs</li> <li>Irrigation scheme (ICOUR)</li> <li>Farm households' capacity to afford adaptation options</li> </ul>
<b>Farm households' well-being</b>	Increased households' well-being	<ul style="list-style-type: none"> <li>Increased farm productivity</li> <li>Increased annual income</li> </ul>
<b>Farm households' vulnerability to climate change</b>	Reduced vulnerability (100%)	<ul style="list-style-type: none"> <li>Involvement in other livelihood activities apart from farming</li> <li>Awareness on climate change and its impacts on farming activities</li> <li>Use of early crops and improved seeds</li> <li>Use of fertilizer and manure</li> </ul>
<b>Use of natural resource base</b>	Decrease of soil erosion rate (100%)	Adoption of good agricultural practices (planting of Vertivar grasses, plough across the slope)

### Classes of local institutions



### CONCLUSION AND RECOMMENDATIONS

- Adaptation options availed are knowledge management, on farm management, diversification, and farm financial management, and investment in infrastructure. However, diversification and farm financial management are less addressed.
- Most of the farm households have access to more than one local institution, and therefore the resources they dispose or the capacity to afford these resources.
- As the result of local institutions support, farm households have experience improvement in their livelihood outcomes.
- Local institutions roles vary. While some act as the core of adaptation, others represent either mediators/brokers or resources flow controllers.
- Build local institutions capacity in enabling diversification, farm financial management or encourage the participation of institutions working in these areas.
- The local government should think of investing more in infrastructure development especially irrigation infrastructures (dams and dugouts) as drought is the most recurrent climate event in the area of study.
- Local institutions should take FHHs to highest level of participation.
- Incoming (new) non-governmental organizations should coordinate with existing local institutions in order to avoid duplication.
- Educate FHHs in viewing agriculture as a business