

Background

22% of GDP

Climate Change

Agriculture

sector in

Ghana

99,8 % of

cultivated

area rainfed

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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INTRODUCTION

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- role of local institutions in enhancing 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.

RESULTS

Objectives

Pan African University

In general this paper aim at assessing the 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

Framework Study area

53,6%

(Active pop)

46,6%

(Rural pop)

Climate Change Impacts External Institutions (Social, spatial, Social Public, civic Intervention risks (Information, temporal structure, ecological and private technology, funds, intensity, predictability Institutions Context leadership) of environmental risks) Adaptation, Institutions and Livelihoods (AIL) Framework Adaptation practices Livelihood outcomes Source: Adapted from Agrawal (2008)

and

Institutions: World

RESULT, ACDEP,

Community Self-

Civic and Public

institutions:

and RESULT

Public and civic

Reliance Center, and

Trax-support, NADMO

(Naara rural bank and

Bongo rural bank),

ICOUR, Trade aid,

institutions

promising),

ICOUR,

well-being

households'

vulnerability

climate

ral resource soil

Use of natu- Decrease

Farm

change

base

well-being

Reduced

(100%)

vulnerability

rate (100%)

Vision,

ADOPTED ADAPTATION OPTIONS (Below et al., 2010) Knowledge management,

network, and governance

On-farm management and technology Diversification (on and Beyond Farm) Farm Financial Management

LIVELIHOOD **OUTCOMES INDICATORS** (GLOPP, 2008)

Income Food security

Vulnerability level Use of natural resource base Government Assistance Well-being

Data analysis

Network Visualization Software or Net DRAW

- ♦ An institution is considered as core when it 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 betweeness centrality score is greater or equal to 19.40
- SPSS (16. 0) for descriptive statistics

Classes of local institutions

Legend

Public institutions

Civic institutions

Communities

Public institution:

Civic institutions

Private institutions

Communities

Private institutions

♦ Adaptation options based of Below et al. (2010) classification ♦ Farm households Livehood outcomes are organized based

in Infrastructure, Health, and Risk Reduction on GLOPP (2008)

DEGREE CENTRALITY/CORE INSTITUTIONS

BETWEENNESS CENTRALITY / MEDIATORS

Institutional support

Institution **Activities** Key intervention involved public Education and trainings Civic, Knowledge institutions: (57%)private management, Radio, Esoko network, and Awareness raising (29%) governance Provision of climate and weather information (14%)

- On-farm management technology varieties (23%)
 - Reduction of post-harvest Civic and public losses (through storage institutions: MoFA, ICOUR, ACDEP, bags and bins) (43 %) World Vision Supply of improved crop
 - Soil and water manage-(through farming fertilizer, pesticide) (23 %)
- **Diversification** (on and Beyond Farm)

Farm

Financial

Legend

Study Area

Road

Bongo District

- On-farm diversification Civic and public extraction of (e.g., non-timber product such as honey, Dawadawa powder and oil) (14 %)
- Off-farm diversification (includes animal rearing, petty trade, aquaculture, and basket weaving and soap production) (86 %)

Credit provision (54 %)

- the Financial Management Improvement access to market (36 %) Provision of insurance insurance companies
 - scheme (9 %)

Infrastructure, Health, and Risk Reduction

Government

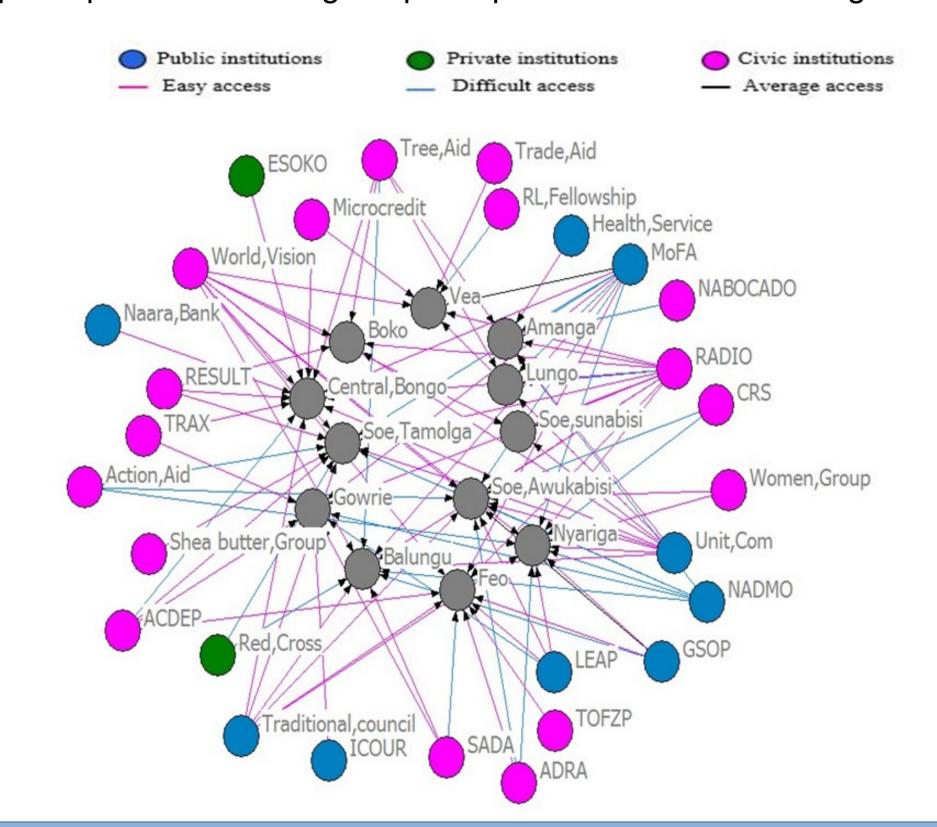
Assistance in

- Infrastructure development (Road: Balungu- institutions: Gorigo, Gorigo-Tambulgo, GSOP (Bongo district Balungu-Soe, Apuwongo- assembly, Dua, Go kadare, Go Tree Aid akasarga and Apuwongo; and Dugouts)
- Infrastructure rehabilitation (Kansoe dam, Adaboya dam, Gambulgu dam, Feo dam, Go dam and Akasanga dam)

Intervention in public health (vaccine and health care)

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
Farm households' Income	Increase in households' income (88 %)	Introduction of alternative livelihood: aquaculture, the extraction of non-timber forest product animal rearing, petty trade and basket weaving.
Farm productivity	Increase in farm produc- tivity (85 %)	 ⇒ Technical support and agricultural ⇒ advice ⇒ Provision of farm inputs ⇒ Irrigation scheme (ICOUR) ⇒ Farm households' capacity to afford ⇒ adaptation options
Farm households'	Increased households'	 ⇒ Increased farm productivity ⇒ Increased annual income

Involvement in other livelihood activi-

⇒ Awareness on climate change and

Use of early crops and improved

impacts on farming activities

ties apart from farming

Use of fertilizer and manure

erosion (planting of Vertivar grasses, plough

of Adoption of good agricultural practices

seeds

across the slope)

farm management, on

diversification, and farm financial management, and investment in infrastructure. However, diversification and farm financial management are less addressed.

⇒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.

CLOSENESS CENTRALITY/ CONTROLLERS

 Public institutions Civic institutions Private institutions Communities Betweenness Closeness Institutions scores scores scores

Public Fraditional Council Public 66 Unit committee Civic Public World vision Civic Public NADMO ACDEP Civic Tree, Aid Civic Public Public Civic RESULT Civic Action, Aid Civic ADRA Civic Civic Civic Microcredit Civic Women, Group Private Red, Cross Naara, Bank Civic Private Civic Shea butter, group TOFZP Civic Public

Public

Civic

Civic

working in these areas.

level of participation.

CONCLUSION AND RECOMMENDATIONS

RL. Fellowship

Trade, Aid NABOCADO

⇒Adaptation options availed are knowledge management,

⇒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.

tutions in order to avoid duplication.

Build local institutions capacity in enabling

diversification, farm financial management or

encourage the participation of institutions

The local government should think of invest-

ing more in infrastructure development espe-

cially irrigation infrastructures (dams and

dugouts) as drought is the most recurrent

Local institutions should take FHHs to highest

Educate FHHs in viewing agriculture as a business

Incoming (new) non-governmental organizations should coordinate with existing local insti-

climate event in the area of study.