



SUSTAINABILITY OF WATERSHED: SOCIAL CAPITAL IN FADAMA AGRICULTURE AT KWADON AREA OF GOMBE STATE, NIGERIA

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ABSTRACT

Sustainability of watersheds through Fadama agricultural practices contributes in solving food crisis. Social capital is becoming an increasingly important variable in sustainably utilizing community resources especially amongst the poor farming communities of developing countries. Selected dimensions of social capital among rural farmers in Kwadon area of Gombe state, NE Nigeria was studied in relation to how they sustain their peri-urban agricultural practices in the watershed over the years. A sample size of 217 respondents was used out of 500 rural Fadama farmer population using Social Capital Integrated Questionnaire (SC-IQ) after World Bank (2003) to get primary data which was later analyzed using IBM SPSS version 20 software for descriptive statistics. The outcome of the study suggests that watershed management and Fadama agriculture has been sustained through moderate social capital within the rural farmers which enhances community development of the farmers in the study area. Findings from the study shows a average degree of social capital in aspects of trust and solidarity between the rural farmers, social cohesion and inclusion was also seen in a moderate percentage, all in support of sustainability of the Kwadon watershed and its peri-urban agricultural practices. Lastly, the paper concludes that sustainability at the local level will be strengthened by farmers through sustaining and improving all dimensions of social capital within their respective agricultural specialization.

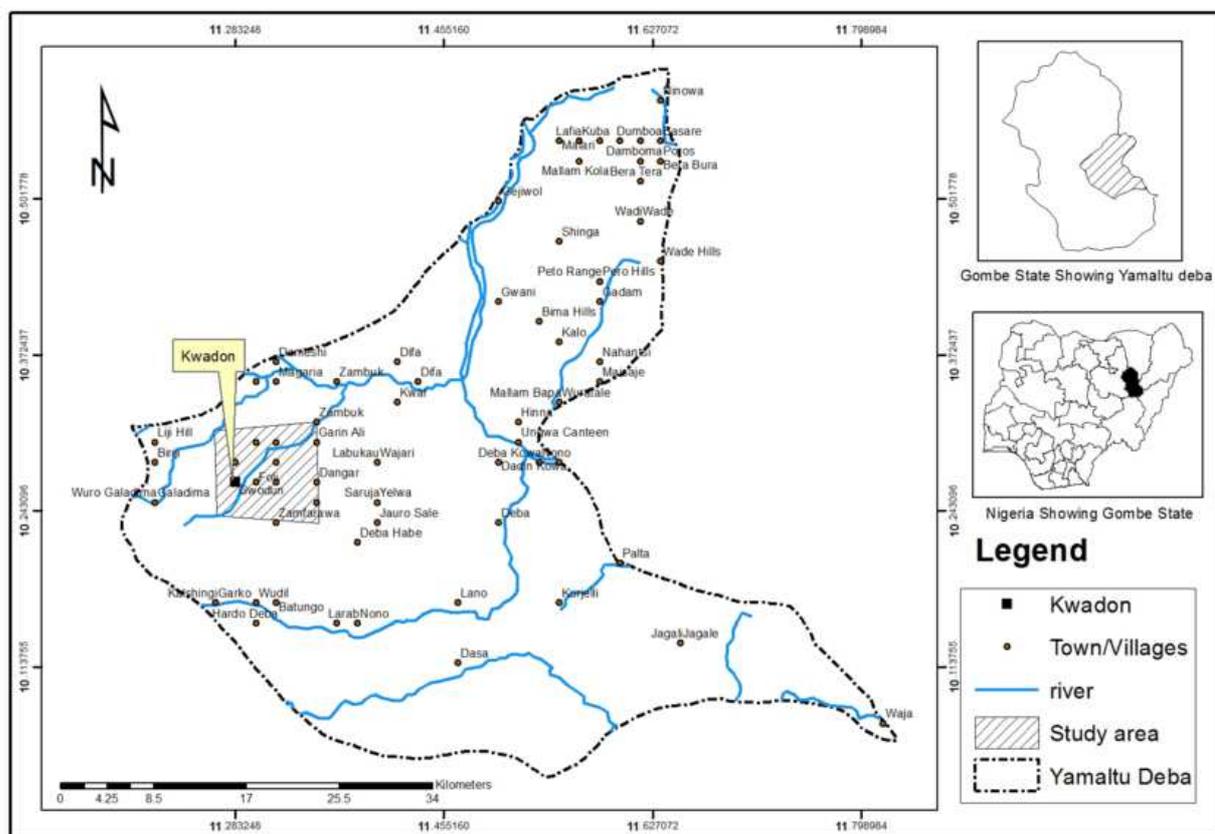
INTRODUCTION

Sustainability of resources is now a functional pillar of developmental studies in most African countries. This study is about social capital in Fadama agriculture and how it is been used to sustain the watershed area of Kwadon and environs. Social capital is sometimes referred to as unseen capital, is a good medium of

providing communities the medium of carrying members along in efforts to see that development is achieved in their society (Wakefield and Poland, 2005). The objective of this paper is to reveal the research findings on how communities through socialself-help initiatives can promote sustainable development of their watershed and farming areas.

Gombe state, located in north-eastern part of Nigeria, has an area of 20,265km² with a population of 2.4million people that are predominantly farmers. As one of the major food basket of the nation 90% of its landmass is cultivable, with 70% of the population engaged in rain-fed agriculture and irrigation. The study area Kwadon falls in Yamaltu-Deba Local Government Area (LGA) of Gombe State. The LGA has a coordinates of 11.38424°N and 10.41614°E with 1,981km² area and a population of 255,248. The study area Kwadon, is located between Latitudes 10.2667° N and Longitude 11.2833° E, about 12.9km east of

Gombe, the capital of Gombe state in the North East zone of Nigeria. The Kwadon watershed area is well known for the production of vegetables all year round using rain fed agriculture and irrigation alike. The rural dwellers in this village are responsible through the practice PUA, in producing vegetables and fruits to the urban population of Gombe, the state capital. The production of the green vegetables has created a weekly market on Mondays, which attracts many buyers from central and southern parts of Nigeria (Gombe State, 2013).



Source: Dept. of Geog. BUK (2016)

Fig. 1: The Study Area, KWADON

WATERSHED SUSTAINABILITY THROUGH SOCIAL CAPITAL

Social capital covers a lot of areas, especially sustaining watershed for the day to day life of village community members. It can be defined as the norms and networks that enable people to act collectively and achieved desired objectives (Woolcock and Narayan, 2000)

Citing Grootaert (1998), Gomez-Limon (2012) sees social capital referring to norms that are complementary covering values, beliefs and attitudes that govern beneficial interactions among people for boosting economic growth and sustainable development.

Poor peasant farmers that do have close-knit and intensive stock of “bonding” social capital enable them to get a collective work leverage making them stronger in controlling poverty and vulnerability over time, because they have conquered fear of being ‘left out of the loop’ through their formidable network, buttressing and supporting Putnam (2000) who observed that at the regional and local levels, there are evidences that social capital among economic actors can produce aggregate economic growth to the area concern. In general social capital according to Narayan and Cassidy (2001) covers everyday sociability, group characteristics, generalized norms, togetherness, neighbourhood connections, volunteerism and trust that can be instrumental in sustainably developing a community.

Watersheds, especially in drylands, play a vital role in human wellbeing, as an important component of the ecosystem, in supporting and sustaining life forms of flora and fauna. Human beings depend on their immediate ecosystems processes to regulate natural cycles, provide recreation, keep watch of diseases to give mental and spiritual enrichments to the societies that utilizes them maximally for sustainability of the resources therein. A watershed is defined, as area of land where all of the water channels that is under it or drains off of it goes into the same place creating a complex ecosystem of plants, animals and human activities benefiting from the resources therein (Shiferaw, Kebede and Reddy, 2008). Another definition sees watershed as a delicate landscape unit that represents a central nervous water system to a given region or a biophysical set-up that is continuously drained by streams or rivers from the high (Ibrahim, 2002). We can therefore note that watershed is an area of land that has a

radial and sometimes dispersed set of streams and rivers that all drains into a single larger water body. Watersheds in the dry land areas falls under common pool resources (CPR) where public participation, is the mechanism that involve common peasants be represented in the sustainable utilization of the resources therein with social capital domains helping in providing collective arrangements for resolving CPR dilemmas that can inhibit progressive development of the community (Ohno et. al, 2010). Watersheds plays a major role in storing and retaining water, regulating its flow for irrigation purposes and promoting the general sustainability of the resources therein. Field study confirmed that resources in the watershed are affected by social relations and networks of the Fadama farmers. The work of Roe (ed.) (2009) supports the above point, where he identified three pillars of: conservation, benefits and empowerment as what community based management of natural resources (CBNRM) is based upon in West Africa, buttressing role of collective action using the CBNRM approach to safeguard watersheds and enable Fadama farmers benefit in using meager resources, as seen to be more amplified in the study area by the local actors as against other people not having access to the watershed resources, suggesting Fadama farmers’ efforts in sustaining resources to cater for their societal needs (Fieldwork, 2013). Sustainable development of our watersheds cannot be achieved without a major and well planned contribution from the agricultural sector. People must be fed, and agriculture at all levels is faced with the challenge of producing food for a rapidly growing world population whilst maintaining the watershed’s fragile resources.

Modern farming systems have over the years, due to increase food demands, evolved to meet this need in a way that combines the essential requirements of profitability and productivity for sustainable watershed management encompassing food production alongside with conservation of finite resources and protection of the natural environment so that the needs of people living in the area can be met, without compromising the ability of future generations to meet their own needs (EISA, 2002). Social capital in the Kwadon watershed has contributed in integrating farming, meeting potentially conflicting challenges at the farm levels, in a manner that balances food production, animal husbandry, social responsibility and environmental care. Integrated Farming in the study area, as practiced by peasant farmers seeks to reinforce the positive influences of agricultural production through promoting a means of achieving a sustainable agriculture through social capital, as an indispensable part of sustainable watershed development. These agricultural approaches by the Fadama farmers will go a long way in sustaining community resources for the benefit of the population at large, because watersheds worldwide are simultaneously managed through various social and spatial scales from individuals to community level initiatives centering on water, vegetal, land property and tenure rights.

METHODOLOGY

The study adopts a mixed research method approach to generate primary

data using qualitative and quantitative research tools. Five hundred farmers were identified in the watershed as actively engaged in Fadama agriculture using rainfall and irrigation. A total of 217 sample sizes were randomly taken using Krejcie and Morgan (1970) method of sample size determination and a quantitative instrument, Integrated questionnaire for the measurement of Social Capital (SC-IQ), developed by the World Bank (2003), was administered to the respondents. Primary data Qualitative research data was generated through interviewing key informants, field observations and conducting focus group discussions (FGD) with a cross-section of Fadama farmers. Descriptive method of analysis was used for this study to understand the quantitative data, while qualitative data was classified, coded, and themed then interpreted to give elaborate understanding to the utilisation of watershed resources and its sustainability through the social capital domains. Secondary data sources were drawn from relevant published and unpublished sources.

FINDINGS AND DISCUSSIONS

In every community, especially rural ones, some people get attached with others and trust each other, while other people do not. The Kwadon rural farmers exhibit some degree of trust and solidarity within those engaged in Fadama farming in the watershed. **Table 1** gives a descriptive picture of its distribution among the rural farmers.

Table 1: Level of Trust and Solidarity (N = 217)

Trust and Solidarity	Frequency	Percent	Mean	SD
Low (6 – 10.33)	64	29.5	10.84	3.54
Moderate (10.34 – 14.66)	105	48.4		
High (14.67 – 19)	48	22.1		

Source: Fieldwork (2013)

The total respondents in the study (217), majority of them (105), making 48.4% of the population exhibit moderate social capital traits in the domain of trust and solidarity within their PUA farming practice, creating a sort of togetherness within the Fadama farming group in efforts to sustainably utilize watershed resources. Farmers with low trust and solidarity account for 64 persons making 29.5% of the population while high trust and solidarity was witnessed with only 48 farmers making a total of 22.1% of the Fadama farmers.

With a higher percentage of the Fadama farmers having moderate social capital domain, the community suggest that the sustainability of the watershed is on the average and there will be need for

improvement to have an increased status for the domain and increase sustainability of the watershed water resources for continued activities of peri-urban agriculture.

The next social capital domain looked into was the area of social cohesion and inclusion. There are often differences in characteristics between people living in the same community in terms of wealth, income, social status, ethnicity, political and political beliefs and these will lead to what extent social relations are taken into consideration within the society, as it relates to resource utilization and management. **Table II** shows the descriptive distribution of the social capital domain of cohesion and inclusion within the PUA farmers.

Table II: Level of Social Cohesion and Inclusion (N = 217)

Social Cohesion	Frequency	Percent	Mean	SD
Low (4 – 6.66)	50	23.0	6.98	2.23
Moderate (6.67 – 9.32)	146	67.3		
High (9.33 – 12)	21	9.7		

Source: Fieldwork (2013)

In the area of social cohesion and inclusion within the Fadama farmers, it provides a medium of collective action in the watershed area and serving as a way of their self-devised method and strategies that will make resources of the area sustainable. Farmers in rural areas are good in cooperation and reciprocity which will spread good ideas from farmer to farmer through social learning processes that will impliedly promote sustainability. The descriptive data shows farmers with moderate domain here accounted for 67.3%, 146 persons out of the 217 total respondents. The mean score is 6.98 and standard deviation of 2.23. Farmers with

high social cohesion and inclusion in the study, shows a smaller record of 9.7% with only 21 respondents. The 50 Fadama farmers representing 23% of the respondents showed a low domain in social cohesion and inclusion as indicated in table II. From the foregoing, the data seems to suggest that the social inclusion and cohesion within the Fadama farmers also help in strengthening the watershed sustainability as portrayed by the responses by 146 farmers representing 67.3% of the total respondents followed by those with low domain 50 farmers representing 23% of the 217 respondents.

Conclusion and Recommendations

In conclusion, the researcher tried in this paper to see the place of social capital in peri-urban agriculture and sustaining watersheds for increased food production. The farmers of Kwadon watershed were advantaged to get a favourable physical location that enables them to engage in peri-urban agriculture, a certain specialized effort in producing fruits and vegetables coupled with raising livestock for the consumption of urban dwellers in Gombe, the immediate urban centre and the capital of Gombe state, NE Nigeria. Data gathered for this study, which was descriptively analysed suggest a moderate levels of two social capital domains: i)

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