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Socio Economic Challenges of Irrigation Farming Along River Yobe (A case study of Yobe State)

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I. Introduction

The term irrigation is defined by different authors and by different universal references encyclopaedia as a process of providing more water for agricultural land than is naturally available. Also irrigated farming may be defined as the application of water, by human agency to assist the growth of crops and pasture (Carruthers and Clark, 1983). According to Koç (2018) define irrigation as the utilization of water being applied to the soil for assisting in the growing of crops. Irrigation is quite important for the World in general and it plays a crucial role in growth and development at local, national, and international levels

Irrigation may also enable government exercise greater control over farmers cropping decisions through extension. Also it further expands the term as process which enables crops to be growth in dry area that would not naturally support agriculture such as in the rural area.

In order to strategies the potentials of the irrigation to diversity socio economic wellbeing in the state, the research has identified a member of consolidated technological result from study or improvement for making irrigation closer to sustainability that have not been adopted by agricultural water users along the Yobe river. But furthermore the study result has made evidence of many cases of unsuccessful irrigation experiences that could only be explained by the underestimation of deep socio economic challenges.

This involves not only the social factors related to the implementation of new technologies by a wide spectrum of users but also the way in which water use and irrigation farmers conceived, planned and implemented by scientists, politician and the practitioners. Moreover, sometimes all the improvements already achieved in the practical skills of irrigation seen not to be enough when socioeconomic factors have not been carefully addressed in each and every stage of irrigation systems. Modernized irrigated farming system offers great promises for increase in production, more year-round employment on the farm can enhance farm incomes in area of the plagued by insufficient rainfall due to the climatic factors. Even in the area where rainfall appears adequate, supplemental irrigation will boost the output and labour productivity of farming as well as generated enhanced incomes (Akinbile, and Sangodoyin, 2011).

Perhaps government stakeholders and other non-governmental agencies should priorities on diversity the areas to combat the challenge of irrigation farming in the state. Therefore, the objectives stated as fallows.

i.To identify the befitting irrigation farming to the farmers and government of the state.

ii.To examine and highlight the nature of economic and socioeconomic important of irrigation farming in the state.

iii.To analyses the socioeconomic key indicator of income distribution under the current irrigation production system

II. Statement of the Problems

irrigation in Yobe state required approaches in order to raise the standard irrigation farming to meet the standard. The success of these depends on the quality of operational requirement of irrigational infrastructure that will be driven to achieve further demand to maintain sufficiency of food crisis due to propelling insecurity in Yobe state.

The problems or negative implication upon the socioeconomic condition of farmers in the area include social impact, poverty in the area and poor policies regarding irrigation management play significant role in distorting the irrigation activities.

Rural small holders, who were already facing un equal distribution land, capital and occurs to infrastructure were most vulnerable to these drought (Andrade et al 2012). Due to the impact of affiliation to specific social classes on drought vulnerability. Several authors indicate that the drought in the semi and region as acclimate as socioeconomic resuming (Hall,1978) under such condition, irrigations is considered a common

strategy to escape droughts in semi-arid vegetation's. International Institute for Environmental Development (IIED 2008).

It is generally accepted that irrigation can transform society as well as land and scopes. As land use changes occur it is expected that significant, mostly positive, social changes will also occur in the state in general.

III. Literature Review

Nigerian population increasing at an alarming rate, for meeting the socioeconomic there is need to diversify adequate attention, to the development of the irrigation and others sectors towards increasing volume of production and productivity to meet the population needs. Nevertheless, there is need to explore the potentials for the growth of agricultural sector Olagunju, (2007).There is need for information to assist cooperative action for the financing, building, and running of irrigation scheme..Furthermore, Andreas (2020) his study has focusing on harnessing existing water sources and rainfall water collection, with structures such as concrete dams, reservoirs and cisterns for rainwater, canals and aqueducts, that were made of dry stone to divert water for irrigation in the required areas.

In order to explore the effect of land water cases on the yield of major crops and its socioeconomic implication on farming community.On the other hand, Moldern et al (2007) added that convenience of considering multiples uses and users of water and to give due attention to the many other people dependants on irrigation water farming including the landless, livestock keepers, fishermen and domestic water users.

The participation issue presenting the usefulness of water users involvement to enhance irrigation projects sustainability once the financial or technical initial support has been withdrawn (Balooni et al 2008) and Singh et al (2008).

Ahmed (2013) the increased use of irrigation to puts a great pressure on the local hydrology and ecosystem it is important to improve large irrigation for food and cash crops production. The adoption of various techniques of irrigation is becoming necessary including the use of sustainable of irrigation that will pave way for simultaneously and productive irrigation.

1.3.1 Development of irrigation in Yobe state

The regions, is basically desert areas and Savannah vegetation, most of the irrigation sites established near the water flows of river Yobe. Furthermore, for many years' irrigation activities has been the sustaining sources of economic benefit to the settlers along the river in the State (Koç 2018). The past experience related to traditional irrigation systems can also give us valuable insight for modern systems. Such lessons that enrich our current design and operation alternatives must be explored Kapil (2020). It is essential to comprehend the history of irrigation development as it assists in augmenting knowledge about the traditional irrigational systems. Irrigation is being practiced by individual that leave near river especial those in Geidam, Gashua and Nguru some arears like Ngalda Fika Local government, Nyakire in Fune Local government, traditionally engage themselves in irrigation for their livelihood. Alsoother areas like Mamudo, Majein Potiskum local government because of low water table they normally cultivate Lettuce, Amarthus and rosette for their economic gains.Irrigation activities practice for many years' variety of crops like Onion, tomato, Watermelon, Morringa, rice, wheat, pepper, Lettuce, and cabbage is being practiced.The regions, which have been called far north since the existence of Nigeria, the irrigation areas settled near the water basins. Furthermore, various villages in the area developed because of irrigation activities where a lot of economic benefit generated through irrigation Koç (2018).

1.3.2 The Need for Modernisation of irrigation.

Development requires infrastructure development such as construction of dams, pumping stations and canal and farm road development. Constraints in labour, land and water resources require the present and future development be mainly targeted at exploiting the full potential of increased cropping intensities and crop yields through rehabilitation, modernization and management review of the existing irrigation systems.

With competing use by other sectors, water is increasingly seen as economic goods. Irrigated agriculture while having to increase and sustain productivity will have to reduce its water consumption and this needs to be achieved at lower financial costs and resource utilization

Farmers have now realized the importance of improved water management as a prerequisite to yield improvement and high quality products. The future scenario is that paddy production will be on an estate basis and water management will be on-demand where commercialization will take its real perspective.

The pressures on improvement of irrigation performance and the changes in farming environment make irrigation management to become more complex.

At farm level, there is a need for real-time on-demand water management to ensure commercializes farming a sustainable venture. The system as a whole must then respond to these changes and be able to support the needs for real-time on-demand system to function and to invent apple and grape vine irrigation where its applicable.

1.3.3 Strategies for Sustainable Irrigation Modernization

New technologies and their application can help to achieve the objectives careful consideration of the logical and relevant irrigation modernization planning D.I.D (1998). The success and failure of water management will depend upon a variety of factors that are typical to software programs. The program must be user friendly and must be developed keeping the user in mind. It is important to have interaction with the ultimate user throughout the development process. Before it is used in practice, the software must be rigorously tested. A modular approach will allow the flexibility of updating and incorporating new computer technology. According to Angel et.al (2018) lamented that, considering the earnamous irrigation patterns, attempt need to be made in order to develop and encourage the use of an improved variety of irrigation crops with easier irrigation practice in Yobe State.

Angel et al (2018) planting strategy need to be adopted dry and wet season, during rainy season either maize, sorghum groundnut, beans should be used, during dry season effective irrigation for vegetable crops should be practiced for economic gains.

Table 1: Irrigation Approach from Different Authors Perspective

SN	Author	Year of Publications	Title of publication	Irrigation Strategies	Findings of the Author
1	Kapil	(2020)	Kapil.K (2020)Factors determining farmers' strength of access to the irrigation system in Kaski district of Nepal, Cogent Food & Agriculture.	Training and retraining of irrigators lead to a greater success.	Sound irrigation knowledge contributed to a strong access to irrigation
2	Andrea	(2020)	Irrigation of World Agricultural Lands: Evolution through the Millennia. Water 2020, 12, 1285; doi:10.3390/w12051285 available from www.mdpi.com/journal/water	Harnessing existing water sources and rainfall water collection	The use of structures to divert water for irrigation
3	Koç	(2018)	The Past and Present of Irrigation Services in Turkey. Agric Res 7, 480–489 (2018). https://doi.org/10.1007/s40003-018-0332-8	Historical approaches in irrigation management.	The past experience irrigation systems give valuable design to enrich operation.
4	Santosh et al	(2020)	Assessment of Socio- Economic Factors Impacting On The Cropping Intensity of An Irrigation Scheme In Developing Countries† https://doi.org/10.1002/ird.2427	Focused on the impact of socio- economic factors on cropping intensity in an irrigation scheme.	Irrigators socio- economic status and their socio- cultural practices affected cropping intensity.
5	Kunlun	(2018)	State of Knowledge of Irrigation Techniques and Practicalities within Given Socio- Economic Settings	Using ICT, remote sensing, control systems improved performance of irrigation systems.	Improving surface irrigation through technology applications.
6	Agula et al.	(2018)	Promoting ecosystem-friendly irrigationfarm management practices for sustainablelivelihoods in Africa: The Ghanaian Experience	Strategies irrigational projects that involved ecosystem Management	The study highlighted the practices of conservative tillage, organic manure application.
7	Phiri et al	(2019)	Transdisciplinary Development and Adoption of Irrigation Innovations in Africa. Linkages to Principles of Caadp.	Advocating for irrigation and innovation toward optimization of irrigatedproduction	Irrigation is an exciting and promising to generate income for society.

IV. Methodology

4.1 Study Area

The location of study sites, Geidam and Gashua in Yobe State respectively as shown in Figure1. The vegetation of study area comprises of Savanah and arid zones of Yobe State respectively. Moreover, the area is characterised by high population in the urban areas while in the rural setting they are sparsely populated,poverty levels are drivers of increased livelihood and vulnerability. Data were collected from community engaged in irrigation farming through survey and key informal interview inGeidam and Gashua respectively. The villagewere categories in ABCD format for easier identification, the data were collected through survey, interview and case study for the final analysis.Geidam is a Local Government Area in Yobe State, Nigeria. Geidam, located at 12°53′49″N 11°55′49″E. It has a total area of 4,357 km² and a population of 157,295 at the 2006 census. Gashua has an average elevation of about 299 m it has population of about 125,000 according to census (2006). In Yobe State the hottest months are March and April with temperature ranges from 38-40o Celsius. While in June to September, temperatures fall between to 23-28 Celsius, with rainfall of 500 to 1000mm.wikipedia, (2021)

Fig1 :Map of Geidam and Gashua
Sources: Google.com

4.2 Data collection Method

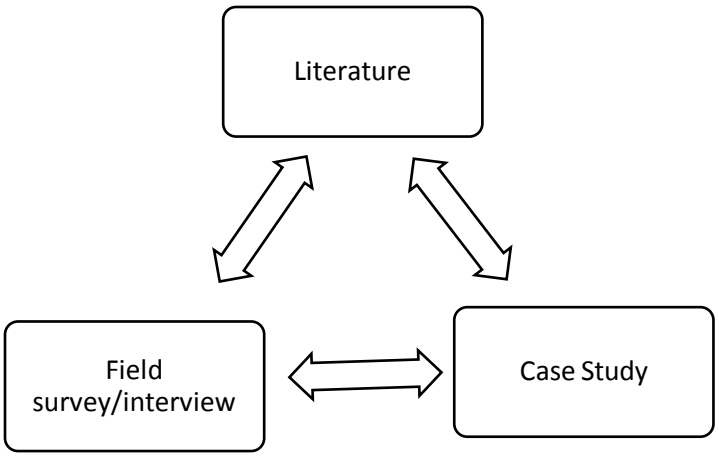
Data collection tools are the instruments used for obtaining data from a population. The procedures, on the other hand, are the mechanisms adopted, using the tools, to solicit for the data. In this research the basic tools and procedures for socio-economic research in irrigation are Field Survey, Group Discussions (GDs) and Interviews across the selected villages in Geidam and Gashua. The conduction of effective group discussion is therefore important (Dikson, 2009). The field survey includes preliminary survey and procedures that include Rapid Rural Appraisal (RRA), other participatory approaches.

Rapid Rural Appraisal

Normally, during the questionnaire pretesting exercise, RRA is carried out in the study area. In this particular circumstance, this procedure, which is known in some disciplines as Rapid Assessment Procedure (RAP) or Informal Agricultural Survey (IAS), would essentially be a reconnaissance survey. In the case of socio-economics in irrigation, this was being done to establish, among others, operations concerning irrigation Method, materials used, types of crop they used to grow and techniques involves. The appraisal may involve walking or driving through the survey area to observe the fields and meeting with elders and talking to irrigators and questioning them informally about how they conduct their irrigation operations (Dickson 2009).

Interview in narrative format could be viewed soliciting for support or idea to interpret based on a sequential process that can be informed of written, recording or spoken presentation in a precise inquiry (Leong, et al. 2013).

Case study for the research focusing to adopt from many literatures and proposes recommendation for improving irrigation in Yobe State, Nigeria. Kumar (2005) point out, the structure together with the procedure for investigation techniques of how the research were conducted and sourcing relevant information on irrigation practices. Recommendations from literatures will add more knowledge to confront a lot of socioeconomic effect. The research was conducted base on triangulation techniques.



V. Result and Discussion

The study reveal the perception of environmental change differs across ecological gradient and irrigators moreover, physical position along the irrigation canals, labour scarcity, investment in technology. The irrigation farming being that the other alternatives way of crop production, applying artificial water to the product needs to meet the international standard.

The policy on irrigation farming for the state farmers is, therefore, not significantly different from other policies directed on the other farming groups as shown in Table 1 & 2 respectively. What is peculiar is the need of specificity, clarity, and timeless to meet the differing needs of each irrigation farming community in terms of structure, conduct, and performance. It must also be inline closely with the goals and aspiration of the farmers in such of a manner that gradually participating structural changes that enlarge irrigation horizon, in all cases the farmer undertaking irrigated cultivation must see himself as the participant and as the instrument of changes.

Table 1: Rapid Rural Appraisal result of Gashua Villages

Bade River	**A**	**B**	**C**	**D**
Irrigated Area	Near Bade River	Karage River canal	Katuzu River channel	Near Amshi river
Irrigated Crops	Tomatoes, pepper garden egg and rosette	Amaratus,onion,okra and pepper	Carrot,pepper,rossett and garden egg	Onion,rossett,chillies and tomatoes
Hectares (Ha)	NA	NA	NA	NA
Water Sources	Wash borehole and river stream	Wash borehole and from running river	Wash borehole and the river source	Wash borehole and river stream
Materials	Long Pipe, Pumping Gen,Hoe and Spade	Long Pipe, Pumping Gen,Hoe and Spade	Long Pipe, Pumping Gen,Hoe and Spade	Long Pipe, Pumping Gen,Hoe and Spade
Economic Benefit	₦200000 per season	₦150000 per season	₦180000	₦178000

Sources: Olagunju (2007)

Table 2: Rapid Rural Appraisal result of Geidam Villages.

Geidam	**A**	**B**	**C**	**D**
Irrigated Area	Near Ballara River	Near Bukarti canal	Near kalgeri river	Near Geidam river
Irrigated Crops	Tomatoes, pepper garden egg and rosette	Amaratus,onion,okra and pepper, watermelon	Carrot,pepper,rossett and garden egg	Onion,rossett,chillies and tomatoes
Hectares (Ha)	NA	NA	NA	NA
Water Sources	Wash bore hall and running river	Wash bore and using river water	Wash bore hall and water from river	Wash bore hall and water from water
Materials	Long Pipe, Pumping Generator, Hoe and Spade	Long Pipe,Generator, Hoe and Spade	Long Pipe,Generator, Hoe and Spade	Long Pipe, Generator, Hoe and Spade
Economic Benefit	₦200,000 per season	₦150,000 per season	₦180,000 Per season	₦178,000 Person

Sources: Olagunju (2007)

Adaptability and affordability of new technologies under different socio- economic scenarios will boost knowledge of intended irrigators for better change. Water transfer through channels dams or any other mechanism, from both sources surface of water and groundwater, as an economically enceinte mechanism to address drought ejects as reveal in Andreas (2020).Furthermore, Angel et al (2018) his research focusing on modifying irrigation volume crops could increase public benefit, thus the use of irrigation crop like onions, pepper, tomatoes and cucumber remain agronomical valid especially in dry area like Yobe State most of the irrigated crops are sensitive to water stress than other irrigated crops but they depend on good irrigation management the result reveal that as the same with that of Angel (2018).

From the table 2 and 3 many group of many people are using wash boreholes as their source of water, while long pipe and pumping generator for water distribution during dry season in order to grow their crop like tomatoes, cucumber, watermelon, pepper. However, their economic gain is less compared to the time of dry season, where they grow only one crop for daily economic gains. To sharpen the national focus on development exploitation and use of water in support of irrigation. It is prefiguring that through this arrangement and role conflicting will be minimized and focus to develop and support irrigation farming by reducing the nation's dependency on rainy season farming D.ID.(1998).However, in order to improve the economic and environmental performance of public pump irrigation schemes of the State, numerous challenges are needed to contribute to saving irrigation water in the future: institutional support (input supply, output marketing, and credit services), training of tenants on improved crop and water management issues, regular supervision, and monitoring of scheme activities are crucial Ahmed et al (2013). While Angel et al (2018) stressing the useful tools for estimating the economic value of water and its demand for irrigation use, as well as for assessing water distribution. Due to aggressiveness of the irrigation areas a lot of water technology is required for efficient water distribution effective mechanism to address drought problems. The modern method compensates disadvantage of traditional methods and thus help in proper way of water usage like sprinkler and drip irrigational system. Must at times crops for irrigation required regular water application interval of time for effective growth of crops for effective usage.

VI. Conclusion

Based on the result of the study, the sources of livelihood capability from irrigation farming will be initiated to irrigators in the State. This will improve the income status of the farmers by empowering them with good incomes to participate in the irrigation farming schemes. Education will play a vital role for training and retraining. Furthermore, they will have the ability and active participation to improve in irrigation activities across the State. The powerful momentum built up in the past behind largely irreversible, and expensive irrigation farming system, provides a warming and a justification for a more economic analysis in future. There is need of emergence of widespread of awareness among policymaker in the state to tackle the issue of sufficiency in food crop production by a rash into irrigation farming system. Due to aggressiveness of the irrigation areas I n Yobe State a lot of technology is required for efficient water distribution effective mechanism to address drought and permanent irrigation as a stronghold farming solution.

VII. Recommendation

1. Greenhouse during dry season is required and construction of several dams, agricultural fields and a rugged terrain to meet the targeted demand.
2. Participatory approach and system modernization planning of irrigators equipping them on possible solutions to raise the standard of irrigation all over the State.
3. Government should give incentives to ensure irrigation marketers readily at each villages to ease their product sales.
4. Education is also an important tool for effective awareness in revitalising the glory irrigational activities in the State.
5. The irrigation farming should be extended to the other part of the state, especially where they have potential irrigation sites and water availability especially in Geidam, Gashua, Nguru and other part of Fune Local government of the State

References

[1]. Ahmed. E, Sulaiman. J & Mohd S. T (2013) Assessment and comparison of conventional and modern irrigation systems to manage irrigation water supplies in the River Nile State of Sudan available https://doi.org/10.1080/19443994.2013.808803
[2]. Ahmed. E, Sulaiman .J & Mohd .S (2013) Assessment of socioeconomic aspects in irrigation water use inefficiency in Sudan available from https://doi.org/10.1080/19443994.2013.808785
[3]. Akibile, C.O. and Sangodoyin, A.Y. (2011). Crop water use Responses of upland Rice to Differential water distribution under sprinkler irrigation system. Pacific J. Sci.
[4]. .Agula C. A, Mamudu .A A, Franklin N. M and Saa D (2018) Promoting ecosystem-friendly irrigation farm management practices for sustainable livelihoods in Africa: The Ghanaianexperience https://doi.org/10.1186/s40100-018-0109-1

[5]. Andrade, E.M., Paulo Cosenza, J., Pinguelli Rosa, L., Lacerda, G., (2012). The valuability of hydroelectric generation in Northeast Brazil. The environmental and business risks for CHESF. Renewable and sustainable energy reviews 16, 5760-5769. doi:10, 1016Ij.rser 2012. 06.028.
[6]. Andreas. N, (2020) Irrigation of World Agricultural Lands: Evolution through the Millennia. Water 2020, 12, 1285; doi:10.3390/w12051285 available from www.mdpi.com/journal/water
[7]. Angel. U, Marco. P, Anna .M, Olga .V, Nikolias P .Nikoliadis, F. Bauroari (2018) Identifying efficient agricultural irrigation strategies in crate available from journal homepage: www.elsevier.com/locate/scitotenv
[8]. Baloomi, et al (2008) Community initiative in Building and managing temporary check-dams across seasonal streams for water harvesting in south India. Agric. Water Manage. 95:1314.1322.
[9]. Carruthers, I.D and Clark. C (1983). The economics of irrigation. Liverpool University Press.
[10]. D.I.D and JICA, 1998, "The Study on Modernisation of Irrigation Water Management System in the Granary Areas of Peninsular Malaysia", Nippon Koei, 1998
[11]. Dickson M. N (2009) Household Data Collection for Socio Economic Research in Agriculture: Approaches and Challenges in Developing Countries. Article in Journal of Social Sciences · https://www.researchgate.net/publication/242276982
[12]. Hall. A (1978). Drought and irrigation in northeast Brazil. Cambridge Univ. Pr., Cambridge.
[13]. IIED (2008) International Institute for Environmental Development Climate Change and dryland.
[14]. Kapil. K (2020) Factors determining farmers' strength of access to the irrigation system in Kaski district of Nepal, Cogent Food & Agriculture, 6:1, 1843751, DOI: 10.1080/23311932.2020.1843751available. https://doi.org/10.1080/23311932.2020.1843751
[15]. Koç, C. (2018). The Past and Present of Irrigation Services in Turkey. Agric Res 7, 480–489 (2018).
[16]. Kumar, R. (2005). Research methodology: a systematic guide for beginners. London: SAGE
[17]. Kunlun. D (2018) State of Knowledge of Irrigation Techniques and Practicalities within Given Socio- Economic Settings
[18]. Molden et, al (2007). Performance assessment, irrigation service delivery and poverty reduction; benefit of improved system management. Special issue; Irrigation and Poverty Alleviation: Pro-poor Intervention strategies in Irrigated Agriculture. Irrig. Drain. 56:307-320
[19]. Olagunju E. G (2007). Water resources development: opportunities for increased agricultural production in Nigeria.
[20]. Phiri. E, Bwalya.M, Froebrich. J, Mweetwa A.M, Chishala B.H, Meebelo.N, Shepande C.M, De Witt. M, and De Clercq.W (2019) Tran disciplinary Development and Adoption of Irrigation Innovations in Africa. Linkages to Principles of Caadp: Irrig. and Drain. 69 (Suppl. 1): 148–154 (2020) Published online in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/ird.2376. Modern methods of irrigation accessed On-Line at (2021) available from https://byjus.com/biology/modern-methods-of-irrigation/
[21]. Santosh .K , Ted .G, Ashok K. S,(2020) Assessment of Socio-Economic Factors Impacting On The Cropping Intensity of An Irrigation Scheme In Developing Countries† https://doi.org/10.1002/ird.2427
[22]. Singh et al, (2008). Scientific perfections and Community responses in a participatory water management endeavour. Water Resour. Manage. 22: 1173-1189.
[23]. Google Map (2021)https://www.humanitarianresponse.info/sites/www.humanitarianresponse
[24]. Google Map (2021)https://reliefweb.int/sites/reliefweb.int/files/resources
[25]. Wikipedia (2021) available from https://en.wikipedia.org/wiki/Gashua
[26]. Wikipedia (2021) available from https://en.wikipedia.org/wiki/Geidam

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