Full Length Research Paper

**Typha Grass Militating Against Agricultural Productivity along Hadejia River, Jigawa State, Nigeria**

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This research work tries to examine the socioeconomic impact of typha grass in some parts of north eastern Jigawa State, Nigeria. For better understanding of the field conditions with regards to the impact of the grass on the socioeconomic of the area (agriculture, fishing and the livelihood pattern), three hundred (300) questionnaires were designed and administered, out of which only two hundred and forty six (246) were returned. Findings from the questionnaire survey of some communities along river Hadejia show that, there is general reduction in the flow of water in the river channel over the last few years. This was attributed to blockages by typha grass and silt deposits within the river channel. There is also reduced or loss of cultivation of some crops particularly irrigated crops such as maize, rice, wheat and vegetables, fishing activities in the area is also affected by the grass. Moreover, communities have tried communal and individual manual clearance of the typha, while Jigawa State and Federal Governments are also carrying out mechanical clearance work in the channel. All these efforts have little impact.

Key words: Typha grass, Irrigated crops, Hadejia River.

**INTRODUCTION**

Typha grass, also known as cattail, is a plant locally referred to as “Kachala” by the people living around the Hadejia – Nguru wetland area. (Akinsola, 2000). Typha grass is suspected to have invaded Nigerian inland wetlands from East Africa. The genus has a largely Northern Hemisphere distribution, but is essentially cosmopolitan. The most widespread species is Typha latifolia, found throughout most of North America, Europe, Asia and Africa. T. angustifolia is nearly as widespread, but does not extend so far north. T. domingensis is a more southerly American species, extending from the US to South America, and it is also found in Africa, while T. laxmannii, T. minima and T. shuttleworthii are largely restricted to Asia and parts of southern Europe (Duke, 1998, Gould 1975). According to Harrington 1964, Uchytll 1992, and Welsh et al., 1987, T. capensis (formerly T. latifolia) and T. domingensis (formerly T. australis) are the two African Typha species. Most of the communities along Hadejia River are currently embattled with proliferation of typha grass, which is colonizing most importantly, irrigated lands, ponds, grazing lands, river channels and reservoirs, causing blockages by the grass and siltation aided by the grass (Ramsar Swiss Grant Report for Africa, 2006). The plant produces vast quantities of long lived and persistent seeds which can out – crop even after some dry spans, thus, re-emergence of typha is very rapid after each removal. These phenomenons make the spread of this weed fast and difficult to control (Abdullahi, 2007). Out of the 10,000km² of Hadejia river basin within Jigawa State, 1,000km² are exposed to temporary flooding and siltation, with serious ecological repercussion and detrimental economic and social impact. Reason to these annual flood seem to lie on the blockage of channels by typha grass, growing rapidly and taking over farmlands, fishing ponds, canals, reservoirs in Hadejia and Nguru, Yobe State (Gomes, et al.,2003).

Most of the areas covered by typha fall within the critical areas that are best suitable for flood rice farming and recession farming. These are the margins of lakes and swamps of slow moving water where the soils do not dry out completely. The grass colonizes these areas very quickly due to the wide and efficient dispersal of seeds by wind and water movement (Akinsola, 2000).

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Statement of the Research Problem

Typha is a serious problem threatening the sustainability of the whole irrigation scheme. Over 80% of the main canal and other water distributary channels were overtaken by this type of weed, thereby blocking the free flow of water in to the irrigation fields (Haruna, 2006).

North eastern Jigawa State is currently embattled with proliferation of an invasive typha grass which is colonizing most importantly, irrigated lands, ponds, grazing lands, river channels and reservoirs, causing blockages by the grass and siltation aided by the grass. The people are currently living in abject poverty and apprehension in fear of what to do next. Some communities are planning to migrate to either Niger Republic or Chad following what they regard to as the failure of the Government to rescue their farmlands from invasion by typha grass, which they describe as the most dreadful threat to their source of livelihood (Hadejia Emirate Development Association, HEDA, 2004).

Twenty years ago, waters of the River Hadejia and Jama are seasonally flooded their intricate network of smaller river channels, providing fish ponds and fadamas in abundance as productive resources for fishermen, farmers and livestock rearers. It is on record that fish catches from Hadejia – Nguru wetlands contributed about 6% of the annual national income of inland fish sales in Nigeria. Today, it provides only 0.6%. Cultivation of wheat, maize and vegetables brought local fadama farmers an average income of nearly N10,000 per season (equivalent to roughly US$114) a decade ago, but now brings barely N2,000 (US$14) even after investment in fadama development technology. Rice production, which rapidly expanded in the wetlands during the mid 90’s as a lucrative form of dry season flood recession farming, has dwindled in recent years to invisibility (The Ramsar Swiss Grant for Africa, Report for 2006).

The need to carry out this research work stems from the fact that, the plant (typha grass) presence in the wetland has markedly interfere with the utilization of water and land resources. This inhibits agricultural development and expansion of same which is the primary occupation of the inhabitants. The aim of this study is to examine the impact of typha grass on the socioeconomic of some communities along river Hadejia, Jigawa state and identify feasible strategies to ameliorate the negative impact and improve on the positive ones.

MATERIAL AND METHODS

Hadejia river basin is a 6,000km² large environment of low resilience, localized between latitude 12° 00to 13° 00N and longitude 10° 00to 10° 35'E, (Gomes, et al., 2003). The study seeks to find out through questionnaire administration, the impact of typha grass on the Socio-economic of the people in the study area. Three hundred (300) respondents were issued with questionnaire (Appendix), fifty (50) questionnaire was distributed in each of the six (6) villages. Relevant documents from Jigawa Enhancement of Wetland Livelihoods office (JEWEL), Hadejia Jama'are River Basin Development Authority (HJRBDA), Hadejia Emirate Development Association (HEDA), Coalition for Change C4C (DFID), Integrated Water Resources Management committee (IWRM), Federal and State Ministries of Environment and other stakeholders in the area were reviewed.

RESULTS AND DISCUSSIONS

Presence of Typha grass in the area

Majority of the people (74%) in the sampled villages argue that, Typha grass was first noticed in the area in 1970’s, whereas 21.2% contend that, it was noticed in 1980’s. This corresponds with the work of Hamza, 2007, JWL, 2004, in Hadejia – Komadugu River basin, who reported that, Typha grass was first noticed in the area in 1972. While majority of the people in the area are in the opinion that, the coming of the Typha grass which dries away and make water movement difficult was caused by water and air movement, some believe that, it was brought to the area as a result of introduction of wheat cultivation in the area, while some people argue that. the coming of Typha grass was a curse from God in order to punish the people for disobedience. This contradicts with the work of Hamza (2007) in the Hadejia – Komadugu basin, which reported that, Typha grass was brought about by the activities of environmental conservationists for the purpose of using the grass to preserve endangered birds that have migrated to Africa from Europe. He added that, the endangered migrant’s birds which landed in the area in the 1970’s became visible when the Typha grass appeared in the water. Anonymous (2007), reported that, the Typha grass grow in the area naturally and moves along with running waters just like the stubborn hyacinth, a kind of bulbous perennial herbs which is found in lagoons and creeks in Lagos, some Northern States and South Western part of Nigeria. Typha grass is suspected to have invaded Nigerian inland wetlands from East Africa. This aquatic has become a problem in the last 15 years in the Hadejia-Nguru wetlands and the water resources of the Komadugu-Yobe Basin (Nigeria Conservation Foundation; Country Report on Invasive Alien Species in Nigeria, 2004).

Impact of Typha grass on the Productivity of Farmlands

Data obtained shows that, there is reduced or complete
loss of cultivation of some crops, particularly irrigated crops such as maize, wheat, rice and vegetables in all the areas. This situation is worst in Guri area, where many farmers reported that, before the emergence of Typha grass in the area, they recorded 200 bags of rice in 10 hectares, and now only 45 – 55 bags where recorded in the same piece of land.

This corresponds with the work of HEDA, 2004 and Ramsar Swiss Grant Report, 2006, which reported that, Typha grass has taken over farmlands, which consequently lead to the reduction in harvest from farmlands.

**Socioeconomic Use of Typha grass in the area**

The presence of large quantity of Typha grass in the area has provokes challenge of finding a use of it by the local people. Results of the study shows that, in all the sampled villages, typha grass is used for thatching, roofing huts, as firewood for cooking, use leaves to cover kola nuts, and use for construction of local storage facility (Rumbu). This corresponds with the work of Tyler and Walters, (2002), which reported that, typha species are harvested today in Britain for thatching. They were once harvested for fuel where better sources were unavailable and may hold promise as an energy crop in the future (Hepper, 1968).

**Impact of the grass on Fishing**

The impact of blockage caused by Typha grass has resulted in reduced flow of water in the area. This has consequently results in reduction of fish catch in the area. This corresponds with the work of JWL, 2004, in the area, which reported that, the average fish catch, fishermen per day has reduced from 3-4 basins (worth over N1, 000 per day) to just half a basin of catch per day. Also, most people in the area reported that, there is reduction in fish species.

Moreover, fishermen in the entire sampled village revealed that, though fish catch has reduced, but, the size of the fishes is bigger when compared with the size before the emergence of Typha, this might probably because, Typha grass provides hiding ground for fishes.

**Efforts Made to Control Typha**

In all the sampled villages, communal efforts have been made to clear channels manually and construction of local dykes by the people to prevent flooding which pose threat to their settlement. The Jigawa State government did some mechanical excavation work and also construct large sand embankments to protect the communities against flood. The communities also mentioned that, local Governments give them assistance in the form of bags used for dyke construction. There is also the presence of some Non-Governmental Organizations (NGO’s) in the area. These NGO’s helps in channel clearance, raise awareness for the people to engage in communal efforts and also funds some proposals by the communities.

Some of these NGO’s operating in the area include: Jigawa Wetlands Project (JWL), Nigeria Conservation Foundation (NCF), Hadejia – Nguru Wetland project (HNWP), Coalition for Change C4C (a DFID project), IUCN ROCA, LCBC/GEF project, Ramsar Swiss Grant, Komadugu Yobe basin Development Initiative, and Hadejia – Komadugu – Yobe basin trust Fund.

Moreover, there is also the presence of some Government agencies in the area, these include; Federal Ministry of Water Resources, Hadejia Jama’are river Basin Development Authority, Federal and State Integrated Water Resources Management Committees and Jigawa State Ministry of Environment. Right now the Federal Government of Nigeria is clearing the channels using machines.

**Other effects of Typha grass in the area**

People in the area argue that, Typha grass harbors birds, snakes and mosquitoes. More than 30% of cereal crops by the communities are consumed by quella birds. In most of the villages, many people spend day in the farm scaring away birds. In Hadin village some respondents reported that, during 2007 season they recorded less than a quarter of the expected harvest, and they attributed this to quella birds invading their farm. There are few species recognized as prolific and invasive in the animal world, the most commonly mentioned being locusts and grasshoppers. Quelea quelea, of which there have been large populations these past few years should be added to these arthropod insects. The proliferation of this species is often associated with the development of Typha australis which provides them with an ideal medium for protection and reproduction (Ouedraogo, 2003).

This corresponds with the work of Uchytl (1992), who reported that, the edges are occasionally used for nesting habitat for snowy egrets, black crowned night herons and yellow headed black birds. Even upland songbirds will use fluff from the flowers to line their nests. A few species such as dear use the stands for escape cover. Respondents also pointed out that, they are suffering from lack of irrigation water due to the blockage of main channels distributing water to their areas, while others are facing serious all year round flooding during rainy season, all as a result of blockage by Typha grass and siltation aided by the grass. For example in Dabar Magini village, flooding has taken over farmlands. Some respondents attributed the low production of crops, particularly rice to excessive flooding. This corresponds with the work of Akinsola, 2000, JEWEL, 2003, JEWEL, 2007, Haruna 2006 and Uchytl, 1992 in Hadejia – Komadugu – Yobe basin, which reported that, excessive flooding caused by blockage of river channels and
siltation has lead to adverse consequences of low productivity of crops particularly rice. JEWEL, 2004, added that, in some cases such as in Zugo, Kabak Maguwa and Kasaga villages in the area, more than 90% of lands hitherto used for cultivation and or grazing have been overtaken by flood.

**CONCLUSION**

The floodplains along Hadejia- Jama’are river produce an agricultural surplus in most years (particularly of rice and vegetables), and support a substantial population at relatively high levels of nutrition and income. Floodplains provide a vital element in the pastoral economies of Fulani who move into them in search of grazing in the dry season. Floodplains are also important sources of fish. Hadejia floodplain wetlands facilitate and support the productive economy over an area far beyond their own borders, and are important elements within both the local and national economies. The economy and ecology of the the Hadejia- Jama’are floodplain are threatened with proliferation of an invasive typha grass which is colonizing most irrigated lands, ponds, grazing lands, river channels and reservoirs, causing blockages by the grass and siltation aided by the grass.

The people are currently living in abject poverty, because, the plant presence in the area has markedly interfere with the utilization of water and land resources. This inhibits agricultural development and expansion of same which is the primary occupation of the inhabitants. The consequences of these have been, loss of farmlands, fish, grazinglands etc, leading to migration and increased poverty in the basin. Recent studies indicate that the level or gravity of poverty in the area has increased to about ten folds in the last five years (JEWEL, 2003). Many researchers conducted on the socioeconomic impact of Typha grass have indicated that, Typha infestation prevents easy and safe withdrawal of water from the river. Such stands also provide a congenial habitat for snakes, and a breeding ground for mosquito that transmit malaria. It is also the home of poisonous reptiles and quella birds and the local population is, of course, fearful of this danger. This invasive aquatic plant reduce the flow of water in the irrigation canals by a contraction in the available space and acceleration of frictional resistance to the flow, thus expediting a sedimentation process in the infrastructures (Fall et al. 2003). Fisheries are threatened, and rice paddies, which depend on a good irrigation system, are successively invaded, reducing the agricultural yield (Fall 1998).

**RECOMMENDATION**

The management of typha grass in the area requires the understanding of its ecology within the system. The role of typha in the wetlands as it is now has to be understood. Also the ecological strategies and adaptation of the plant as well as the environmental consequences of controlling typha and of the use of a particular control measures has to be understood.

Many societies now benefit or depend on large number of alien species as food, medicine or raw materials for industry. For example Typha have provided people with building materials. The dried leaves were often woven into furniture and mats, and their pulp and fibers can be made into paper and string. Native people in Tasmania used the hollow stems to make rafts, jewelry, baskets and light spears (Australian National Botanic Garden, 2003). Typha species are harvested today in Britain for thatching (Tyler and Walters, 2002). They were once harvested for fuel where better sources were unavailable and may hold promise as an energy crop in the future (Hepper, 1968). Throughout the world, the stems have been used for building materials, lattice work, baskets and mats. Early in the growing season, common reed is high quality forage for cattle and horses and may be cut for hay.

Based on the above reasons, attempt to develop the plant for cattle feed is hereby recommended. The cut plant should be chopped up and mixed with molasses before being given to animals. This has been tried in Mauritania and was successful.

Various mechanical methods of control have been devised; the most successful consists of regular cutting and subsequent maintenance of 15 to 18 inches of water above the cut stalks. This method was successfully employed in the Murrumbidgee Irrigation Area of New South Wales for many years, and was successful. Jigawa State, Federal Governments, NGO’s and the communities involve should join hands to remove this weed through mechanical means, it was successful else where, and it may probably be the same in Jigawa State. These collaborative efforts have to a large extent proven quite successful in Mauritania and have in some cases completely freed their water bodies, food and cash crops and fishery resources from the scourge of these typha invasion and thus from socio-economic decline, ill-health, unemployment and poverty.

In recent years, alternatives to chemical control of aquatic weeds have been sought for both economic and environmental reasons. One of the most promising biological control agents has been the grass carp or white amur (Ctenopharyngodon idella Val.). The grass carp has been used in Kansas since 1977 in State Fishing Lakes and became legal in neighboring Missouri in 1980 (Mathews, 1978; Haas, 1982). Therefore, grass carp do have some potential for biological control of Typha grass. In any situation where herbicides could not be used and mechanical control is impractical, grass carp may provide a reasonable alternative. More research into this aspect of grass carp use seems in order. Carp have been used
for aquatic vegetation control in Mississippi for the past two decades. These fish, used as a biological control for aquatic vegetation, can be effective and cost efficient when stocked at appropriate rates. Therefore, it is recommended that the government should see the possibility of using grass carp in the Hadejia river, after following all the necessary quarantine procedures.

Raw Material Research and Development Council, Abuja, is also developing a technology to briquette the Typha grass of the Hadejia-Jama’are wetlands. Under this project, the Typha grass, in Hadejia and Nguru, Yobe State, will be briquetted into fuel pellets for local use and export using technology from neighboring Mali. Jigawa State Government should follow up to this agency to see that this project became a reality, not on papers. There is also the need for a regional Program (all states involved) on Typha based on a complete assessment of the situation through consistent financing. A network needs to be created, incorporating all the states of the region around the problem of Typha grass. Consistent financial means need to be sought through NEPAD, NEEDS, SEEDS, NGO’s or by means of any other channel towards organizing research activities and adapting control technologies for the Typha grass, with the involvement of those populations that would benefit from the results.

REFERENCES