

## **Strategies for Sustainable Utilization of Wetland Soils in Akwa Ibom State**

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**Abstract:** This paper summaries the quality of Enyong Creek wetland soils in Mbiabet within Enyong Creek basin. Soil samples were collected in the flood plains and subjected to laboratory analysis. The result showed the soils to be of marginal to moderate fertility. Semi-structured interviews with farmers on wetland utilization and direct observation in Mbiabet revealed that the flood plains were grossly degraded owing to farming practices.

To regenerate farming in the plains, the participatory approach was adopted. A participatory rural appraisal (PRA) team lived with Mbiabet community, familiarised themselves with the people and stimulated critical self-reflected awareness among them. The team initiated institution-building through which creative energies were released in the farmers and an inner conviction awakened for action against the oppressive elements around them. As collective self-confidence grew, the farmers gradually transformed the degraded wetland soils with a determination to make them a sustainable resource for themselves and generations to come.

### **1 Introduction**

Akwa Ibom State is 8,421 km<sup>2</sup> in area. Its population was 2,359,736 and the density 280 in 1991. Some local government areas (LGAs) like Onna and Essien Udim which are rural, have population densities of 766 and 443 respectively. The population is growing at 3.3% annually and over 80% of the total population is rural which tells the small area of land per capita for agricultural production (Okoji, 1992, Okoji and Moses; 1998). Soil degradation is common owing to farming practices and yields are falling. Farmers in wetland areas are increasingly cultivating river flood plains which are rated marginally to moderately suitable for crop production (Ukpong and Ibia, 1998). Enyong Creek and its tributaries are one of these wetlands.

This paper summarises the quality of Enyong Creek wetland soils based on soil analysis and the results of semi-structured interviews with farmers. It also analyses strategies adopted in an attempt at sustainable use of wetland soils in Mbiabet within Enyong Creek basin.

### **2 Study method**

Transects were cut in appropriate sections of the wetland and soil investigation done along the transects at intervals of 200m apart. At each observation point, augering was done to a depth of 100cm. A total of 220 auger points were made. The auger observations determined where representative soil profile pits were dug. Each profile was dug to a depth of 150cm, except where prevented by high water table. Soil samples were taken from the horizons distinguished in the profile pits, air-dried at room temperature and passed through a 2.00mm sieve prior to laboratory analysis. Ten pedons were classified as representative of the sampled area.

Semi-structured interviews were conducted with the local farmers for information on, among other things, farming practice, soil fertility maintenance, water control, and crop pests and diseases. Interviews were held with farmer leaders, women farmers who were household heads, poor farmers with very limited resources, and traditional farmers who have resisted new technologies.

### 3 The enyong creek wetlands

Onofeghora (1990) sees wetlands as areas of submerged land whether natural or artificial, permanent or temporary, whether the water is static or flowing, fresh, brackish or saline. In this paper, wetlands refer to swampy river flood plains which are usually flooded when the rivers are in spate. Our study centres on the wetlands of Mbiabet River, a tributary of Enyong Creek. Both overflow their banks yearly between July and September, the heart of the rainy season. Enyong Creek empties into the Cross River which, with a much greater volume and higher level of water in July – September, impounds the former and causes it and its tributaries to overtop their banks. When the latter's level falls, the Enyong system furiously releases its discharge to the detriment of ill-protected farms (Okoji, 1995).

Before 1956, the plains were hardly used for crop production but as hunting grounds, timber forest, and for gathering of non-timber forest products. That year, the colonial administration found the swamps suitable for rice (*Oryza sativa* Hook, F.) and introduced it. Since then rice has been cultivated in the plains yearly by small farmers. Other crops such as fluted pumpkin (*Telfairia occidentalis* Hook, F.), cocoyam (*Colocasia preussii* Schott in Schott and Endl., melet) and okra (*Hibiscus esculents* Linn.) are grown in the dry season, making use of residual moisture. Bumper harvests were made in the early years of swamp cultivation (1.5t/ha of rice) but in recent years, continuous cropping and crop diseases have contributed to declines in output (1.3t/ha of rice) (Enyong Creek team study report).

Table 1 presents the quality of soils of the flood plains. Some of the parameters (Table 1) tend to portray the marginal to moderate fertility of the Enyong Creek wetland soils and, invariably, their unsustainable utilization. These parameters include the low pH which tells that the soils are strongly acidic, and the seemingly adequate organic matter content – seemingly in that three pedons had organic matter below 2.0% in the surface horizons while the others had values above 2.0% and FAO (1976) reckons that loamy to sandy loam with 2%–3% organic matter content is suitable for rice cultivation. There are deficiencies in available phosphorus and exchangeable potassium is low. Indeed, only four pedons had values of Ech. K. above 0.20cmol/kg which is taken as the critical level for most crops (FPDD, 1989).

Strong though this portrait may be, the high ECEC indicates that the soils have inherent fertility. Macro-nutrient problems e.g. low potassium and low phosphorus can be solved and with the strategies adopted in Mbiabet there is the optimism that Enyong Creek wetlands will be sustainably utilized.

**Table 1 Pertinent soil parameters in the upper 50cm of soils in Enyong Creek wetlands**

Parameter	Range	Mean	Parameter	Range	Mean
Clay (%)	8.8 —80.2	38.90	ECEC (cmol/kg)	5.48 —29.74	14.74
Organic matter (%)	0.82—6.88	1.63	Base satn. (%)	21.00—90.0	68.9
pH	4.32—5.45	4.86	AL satn. (%)	8.0 —79.4	27.0
Avail. P. (mg/kg)	2.3 —93.0	19.1	k. satn. (%)	0.2 —9.5	2.1
Exch. K. (cmol/kg)	0.06—0.67	0.12	EC <sub>24</sub> O (ds/m)	0.010—0.150	0.0

Source: Enyong Creek team study report.

### 4 Sustainable utilization strategies

Consequent upon identifying Enyong flood plains as suitable for rice production, two reservoirs were constructed in Mbiabet to enhance water supply and flood control. Canals were linked to the reservoirs. From these canals ran channels with sluices to rice farms around which earth bunds were built to retain water. Farmers religiously carried out what agricultural officers instructed them to do, including bird scaring and collection of pests.

After the first three harvests, the officers were withdrawn. Subsequent cultivations experienced gradually falling yields possibly due to lapses in cultivation practice since the officers were practically the actual farmers for the years they were there. The canals and channels were blocked by collapsed bunds and annual flooding of farms occurred.

In 1994, a Participatory Rural Appraisal (PRA) team, including the author, conducted a survey of the Enyong flood plains with a view to developing their resources. In Mbiabet, the team was attracted by poorly utilized extensive plains and it decided to facilitate their proper utilization.

No one, however ingenuous, can meaningfully facilitate any change in a community without familiarising with the people. Familiarisation was achieved through rapport building which involved living with the people, getting to know them and their community, with all its socio-economic relationships as well as their cultural situation and problems.

Satisfied that rapport was built, a process of critical awareness-building was initiated by the team among the people. Freire (1972) terms this process “conscientisation”. During this process, self-reflected critical awareness was stimulated in the people of their socio-economic reality and of their ability to transform that reality by their conscious collective action. As Burkey (1993) puts it, it is a process in which the rural people themselves become more aware of their own situation, of the socio-economic reality around them, of their real problems, the causes of these problems, and what measures they themselves can take to begin changing their situation.

For Mbiabet people to come together and pull their human and material resources for purposes of changing their situation, institution – building became necessary. Facilitated by the team, the people organised themselves in groups such as fishermen, farmers, hunters, lumbermen, traders, etc. With the farmers group, discussions, reflections, questioning and analysis took place so to make them become increasingly aware of the agricultural conditions around them. This process released the creative energies in the farmers and awakened an inner conviction that they could take action against the oppressive elements of their reality and transform them.

The old farmers recalled the rich harvests they had when swamp farming was supervised by colonial administrators and discussed what the administrators did. This spurred the younger farmers to action. The reservoirs were dredged and the major canals reopened. Excited by their success in directing run-off from the first rains to the main river, they then renewed the drainage channels and earth bunds. To ensure that both the canals and the channels remained functional and that no broken bunds were rebuilt with weeds, a rotatory inspection committee was set up.

Through these positive experiences and small successes enforcing each other, Mbiabet people started acquiring self-confidence and self-reliance. Indeed, further discussions with the farmers revealed their awareness of other factors which contributed to the poor quality of the wetland soils. Such factors listed by them included continuous cropping, mortgaging of swamp land to non-local farmers, inadequate replenishment of fertility, land tenure laws and land rights, and dearth of agro-chemicals. “We will win (change) all these and our swamps will be like before (as developed by colonial administrators)” declared some farmers almost simultaneously.

Truly, at a special meeting of the farmers with the traditional rulers, they decided to stop continuous cropping of cocoyam (*Colocasia preussii* Schott in Schott and Endi. Melet.) and swamp land mortgaging to non-locals. The block-farming system with a fallow duration of four years was introduced in the plains, while women were to spread organic household waste twice weekly on their husbands’ swamp fallows in the dry season. The village crier was summoned and asked to announce the decisions forth-with.

These measures have started bearing fruits. Today, Mbiabet experiences little or no flood problem, four-year block farming is observed in the swamps, improved varieties of rice (*Oryza sativa* Hook, F.) and maize (*Zea mays* Linn.) with appropriate fertilizers are in use, yields are gradually improving, and a rice mill has been donated to the community by the state government. More gratifying, perhaps, is the regaining of a 70 ha swamp land previously sequestered by the state government and reallocating it to themselves. This acquisition, the farmers reckon, has not only given them more wetland to cultivate but more blocks for enhanced swamp soil fertility maintenance.

## 5 Conclusion

The marginal to moderate wetland soils of Mbiabet are gradually changing for the better through collective participatory activities of the farmers. This affirms Sethi’s (1983) observation re-echoed by Rahman (1984a) that the problem of the rural poor can only be solved by the people themselves, and all solidarity efforts must aim at strengthening their capacity for independent action. The farmers are now

confident that with reduced incidence of present crop diseases, nothing will stop them from making their flood plains a living resource for themselves and their children's children.

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