

# Case Study: Sabujayan- A Mahatma Gandhi NREGA Nadia Initiative towards Flood Protection

Dr. Babulal Mahato, WBCS(Executive), DPRDO & DNO, MGNREGA, Nadia, WB, India

(Email: drbmahato11@gmail.com)

## Introduction

Nadia is a rural backward flood prone district of West Bengal around 150 km north-east of Kolkata having around 223.9 km of international boundary with Bangladesh. Nadia District witnessed devastating flood in 2000 and 2015 where most of the parts of the District were waterlogged and many lives & economic loss were occurred. People of Nadia have to bear with such horrifying situation. This is because of water flow from the rivers like Bhagirathi, Jalangi, Padma, Ichham



ati, Churni, Mathabhanga with total river length of 553.31 km and water used to be inundated in the different parts of the District, which leads to flood like situation in the District. This is regular phenomenon during monsoon times in Nadia.

Soil erosion is one of the largest environmental issues facing the earth today, and the river banks region of India, with heavy rainfall, is particularly affected. Erosion devastates infrastructural activities- landslides, erosion by river and flood water take heavy toll of developed infrastructure. From an engineer's perspective sustainable asset management has posed as a gargantuan task because of soil erosion. Traditional



hard engineering is now found to be inconsistent with the three pillars of sustainability- economy, social and environmental. Hard engineering interventions to prevent erosion have



been attempted over decades in the region, incurring large financial and environmental costs, and with limited success. This in combination with limited State budgets makes finding an alternative, low cost, environmentally sustainable solution imperative. One such method that shows considerable promise is Vetiver grass.

Nadia District is one of the vulnerable Districts to flood due to landslides in river banks of specially Bhagirathi. Water flows out of the river streams and inundated different parts of the District. River streams capture many land parts of the District. Vetiver- A Bio-Engineering tool used to stabilizes river banks through its root system. Vetiver roots used to grow upto 4 metre beneath the soil and stabilize soils & protects

from soil erosion resulting less water inundation into the land causing less flood & less flood like situation in Nadia. Nadia District Administration has taken up the project for vetiver plantation in river banks throughout the District under Mahatma Gandhi NREGA Scheme. It aims to protect river banks and soil erosion in the river sides, which will led to fulfil the dreams of flood free Nadia in future. Vetiver plantation also can provides enhanced livelihood supports to the rural poor by means of making different



types of bye-products from vetiver grass and vetiver roots.



### What is Vetiver?

**Name:** Vetiveria Grass (English), Khus khus (Urdu/ Hindi), Khus (Bengali).

**Family:** - Gramminaea (Renamed as Poaceae),

There are 12 known species and may be hundred different cultivars that exhibit distinctive phenotypic which can be exploited by users depending on need. *Veriveria zizanioides* (Asia Sub- Continent) is best suitable for its root structure of which south Indian type best suitable than north Indian type because of root structure and length for river bank soil erosion stabilization. North Indian type is widely used for root oil in perfumery industry. The roots of Vetiver are



penetration extends up to 5 meters.

the most useful and important part. Most grasses have fibrous roots, which spread out from the underground part of the culm and hold the soil in a horizontal pattern. The roots that penetrate vertically in to the soil are not deep. In contrast, the root system of vetiver grass does not expand horizontally but penetrates vertically deep in to the soil, whether it is the main, secondary or fibrous roots. The horizontal expansion of the vetiver root system is limited up to only 50cm. The root vertical

## Project in Brief

**Required Grass:** *Vetiveria zizanioides* (*Chrysopogon zizanioides*)- South Indian Type, it should be ensured that no other species or cultivar selected for the plantation for river bank stabilization.

**Spacing:** one feet interval planting (6 inches plant to plant and 1-2 feet row to row for vulnerable parts) on an average width of 4.5 metre along the river sides depending on slope width of river and availability of land in the riversides.

**Saplings Plastic or tray:** Saplings can be grown in poly tube or trays.

**Propagation:** Propagation can be done through separation of slips produced during growth of saplings of the grass. It is the best method for producing large numbers of saplings from limited sources of vetiver saplings purchased or available with us.

**Nurturing during Early Establishment:** The saplings can be nurtured with dipping the slips in



farm yard manure liquid and placing them in the poly tube properly filled with fertile soil. The saplings should be nurtured with regular watering and maintaining proper shade and controlled sunshine.



**Planting:** one month full grown saplings in the nursery can be planted in the field. It may contain more slips as during growth of the saplings produces slips which can be divided and planted in the actual field with proper spacing of one feet interval and actual width available in the river banks.

**Watering:** Watering should be done regularly in the nursery as well as actual planting site for proper growth of the tender saplings and

establishment of the saplings.

**Manuring and Fertilizer Application:** It may needs some manuring and fertilizer application for supplying nutrients to the saplings for proper growth and development. Our soil is alluvial and fertile enough to supply nutrients to saplings. Hence, separate nutrients application has not been taken up in the Model Plan Estimate in our District.

**Supervision:** regular watching and supervision needs to protect the saplings as well as intercultural operations time to time as separation of slips, training & pruning of the growing saplings i.e. proper shaping and maintaining growth of the saplings. Provisions for watching and supervision has been made under the Model Plan Estimate provided in the book and circulated from the District Mahatma Gandhi NREGA Cell, Nadia.

**Fencing:** Fencing should be made in the nursery as well as actual planting sites to protect the tender saplings. In addition to the fencing regular watching is necessary. All provisions have been included in the Model Plan Estimates.



### **Financial Aspects:**

Nursery Preparation for raising 100000 saplings: Rupees Two lakh twenty seven thousand three hundred and fifty five only.

Plantation for 500 metre running length: Rupees Two Lakh Thirteen Thousand four Hundred and Twenty Nine only.

Total Project Cost for 743.97 km riversides project length: Rs. Thirty one crore fifty seven lakh only for Nadia District.

Persondays: Fifteen lakh including nursery preparation.

The Sabujayan project is divided into three parts, namely, Part-I. Nursery Raising. Part-II. Restoration cum Plantation in the riversides. Part-III. Handicrafts making from upper parts of vetiver plants through involvement of Self Help Group Members.



Part-I i.e. Nursery raising has been started in the month of December, 2015 and till March, 2016 52 such nurseries have been established in the different blocks. Training for Nursery raising as well as plantation have been conducted in the District, Block and Gram Panchayats. Regular site visit from the District H/Q, Blocks are being done for proper implementation of the project. 12 lakhs slips from South India have been brought in the 52 nurseries in the different blocks and nurtured. These 12 lakh slips now became atleast 20 times multiplication and became 24 crore saplings in these 52 nurseries in the district. The multiplication process is being continueing in the nurseries to get all saplings required in the district and to avoid slips purchase from other sources.



Part-II i.e. restoration cum plantation in the riversides has been just started and has to continue with care to avoid any soil erosion due to heavy rains in this time. Plantation process is the main part of the project Sabujayan and needs proper implementation to get success through this new technology of vetiver plantation. After rainy season, it may be expedited maximum extent so

that the root systed can grow its full length before next rainy season. It requires atleast nine months to grow average root length and soil stabilization in the river banks.

Part-III i.e. Handicraft making through upper parts of vetiver by the Self Help Group Members to enable additional income for the SHG members. Best quality house hold use items can be prepared from the vetiver upper parts and it has immense scope to improve handicraft industry through it. Moreover, vetiver root can be used to prepared perfumery oils which is one of the best quality fragrant oil and widely used in the perfumery industry and soap industry.

Ultimately, Sabujayan project can protect the people of Nadia from the river bank erosion, flood as well as provide economy to the District for additional income generation through the different uses of the wonder grass vetiver.

