Implementation of Green Technologies in Road Construction in Goalpara, Assam

'प्रकृति रक्षति रक्षिता'
'Nature Protects if She is Protected'

- Presented by Team Goalpara
AN OVERVIEW OF GOALPARA DISTRICT

- **Terrain**
  - Goalpara district of Assam has many far flung places comprising both plains and some areas of undulating terrain along the Assam Meghalaya foothills where rural road connectivity has always been an issue for the public as well as administration.

- **Population Pattern:**
  - People from various tribes like Rabhas, Garos, Bodos, Hajong lagging behind in various developmental indices
  - Minorities living in the riverine (char) areas and plains who are also financially, socially and educationally backward.
  - Heterogeneity of ethnic groups such as Nepalis, Bengalis, and Nath Jogis

- **Infrastructure:**
  - Rural Road connectivity in Goalpara District- a matter of grave concern for the administration
ORIGIN OF THE INITIATIVE

- Depletion of natural resources
- Limited rural road connectivity
- Great scarcity of natural resources or raw materials in Goalpara
  - Closure of stone quarries (due to environmental concerns and Supreme Court order)
- Logistical bottle neck
  - Distressed RCC Bridge at Krishnai has choked off resource delivery from North bank of river Brahmaputra, Guwahati, Dudhnoi and Garo Hills (Meghalaya)
- Need for early completion of rural road projects
- Optimisation of natural resource use
- Progress of works in the district gravely hampered
In order to provide all weather connectivity to the people of the district, road construction and that too using green technologies has received very positive feedback and huge support from the people of Goalpara district.

Considering the above, encouragement from the Ministry of Rural Development to implement various Green Technologies for road construction in Goalpara.

To reduce dependence on natural resources
- Implementation of Green Technologies for road construction
  - Waste Plastic Technology
  - Cell Filled Concrete Technology
  - Geogrid Technology (Tenax 3D Grids)
  - Interlocking Concrete Pavement Block (ICBP)
  - Cold-Mix Technology

Completion of 183 kilometres (km) of road length in a very short span of time under Pradhan Mantri Gram Sadak Yojana (PMGSY)
NEW TECHNOLOGIES USED FOR ROAD CONSTRUCTION

Waste Plastic Technology:

- Goalpara is the first district in state of Assam to have started the use of waste plastic technology in PMGSY road
- Plastic roads perform better compared to those constructed with conventional bitumen
- Promotion of the use of plastic waste to construct asphalt roads by the Indian Centre for Plastics in the Environment (ICPE)
- Usage of waste plastic carry bags, disposable cups and bottles that are collected from garbage, dumps
- On initiation of the District Administration and support from the local people, construction of 1.00 km of road under State fund in convergence mode and 1.25 km road under PMGSY
- Plans for construction of further 63.54km of road
Cell Filled Concrete Technology

- Road constructed with cell filled concrete technology requires lesser time of construction.
- Placement of a framework of cells of fresh or recycled polyethylene sheets across the full width of road under tension.
- Filling up of the concrete mix into the cells and compacting by a skid/pan vibrator.
- The cement content is such that the 28-day characteristic compressive strength is a minimum of 30 MPa for a village road.
- Reduced the quantity of aggregates used per kilometre by 68%.
- 80km of road works are in progress under this technology which is highest in the State.
Geogrids are used to build a construction platform over weak subgrades.

- Geogrids are placed within or at the bottom of unbound layers of a flexible pavement system.
- For carrying equipment and facilitating the construction of the pavement system without excessive deformations of the subgrade.
- Improvement of the load-carrying capacity of the pavement under repeated traffic.
- 20km of road works are in progress under this technology.
Interlocking Concrete Block Pavement (ICBP):

- An environment-friendly and labour intensive paving technology

- Consists of interlocking flat concrete blocks on coarse bedding sand, with fine sand between the blocks

- Already 130km of road works are in progress and mass production of blocks locally has resulted in sanctioning another 100km of road

- Coming of this technology has initiated rapid development of CC block industry across various areas of the district
Cold Mix Technology

- Pavement technology without heating the bitumen.
- Usage of Cold mix bitumen Emulsion in India is a sustainable technology and ideal for India as use of bitumen emulsion negates the heating of aggregate and binder.
- Aggregates are made wet with water and then further coating of bitumen emulsion is done.
- No need for maintaining high temperature while manufacturing and laying the mix.
- Improved quality assurance.
- Pollution free environment.
- Low risk for the labourers.
- Favourable for working in all different weather conditions.
- Energy saving as no heating required.
- 25km of road works are in progress.
Rural road Connectivity has been boosted from 49% to about 70% by the use of green technologies.

Progress of road construction works 29.67 km/year in last 18 years whereas in the current fiscal year target achievement of 183km about to be achieved.

Achievement of 183 kilometres (km) of road built under environment friendly green technology, thus providing 433 numbers of habitations with access to all weather roads since April 2018.

Reduced dependence on natural resources.

Recycling of waste plastic minimised the cost of construction & maintenance, thereby leading to economic benefits.

Further, Government of Assam has recently sanctioned additional 63.54km for waste plastic, 18.40km for cell filled and 52.672km for ICBP under State Owned Priority Development (SOPD) for the year 2018-19.

IMPACT AND OUTCOMES OF THE INITIATIVE
BENEFITS FOR THE PEOPLE

- All weather connectivity for 433 numbers of habitations of the district
  - Socio-economic development

- Reduction in plastic waste pollution
  - Usage of 1,485 kgs of waste plastic under PMGSY
  - Target for usage of 42,000 kgs of waste plastic under State Funds

- Coming of ICBP technology has initiated rapid development of CC block industry across various areas of the district

- Plan to set up a mini production plant in the district
  - For processing the waste plastic to be used in road construction
  - Involvement of the local youth

- Introduced a new android based application called “Infrastructure Snapshot” for monitoring of public institutions, government schemes and public sites.
CONCLUSION

- Achievement of tremendous success in implementation of these environment friendly technologies
- Emerged as pioneers in the field of green technology amongst all the districts of the state
- Reduction of dependence on natural resources
- Recycling of waste plastic
- Minimized the cost of road construction and maintenance
- All weather rural road connectivity
- Socio-economic development
- Industrial growth
- Energy conservation
- Dream of a Clean and Green Goalpara.

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Goalpara dist adopts green tech for rural roads construction

CORRESPONDENT

GOALPARA, Feb 20: At the initiative of the district administration, Goalpara has set an example by adopting green technologies in the construction of a number of rural roads under the Pradhan Mantri Gram Sadak Yojana (PMGSY) scheme across the district.

Talking to this correspondent, Deputy Commissioner Varnali Deka said that it is a pioneering effort of the PWD RR Goalpara Division to adopt green technologies for road construction for enhancing accessibility in providing all weather road connectivity to the people, particularly those living in the rural areas. She also said that the green technologies such as waste plastic technology, geo-grid technology, cell-filled concrete technology, interlocking concrete block pavement will not only reduce dependence on natural resources, but also make it economically viable by bringing down the construction cost as well as maintenance of the roads. It is also an effort to save the environment. She informed that around 150 km of roads have been constructed by using various green technologies in the last six months. The Ministry of Rural Development has sanctioned a total of 565 km-length for the district under PMGSY for 2018-19 out of which the targeted 380 km will be completed within the scheduled time.

Meanwhile, Assistant Engineer (Roads), Banajit Adhikary said that by adopting various green technologies for the construction of roads, the delay in progress of work due to depleting natural resources and closure of stone quarries have been overcome in the district. Moreover, he is of the opinion that if all the districts promote and encourage implementation of green technology, the delay will be reduced considerably and construction of roads, particularly under the PMGSY scheme can be carried out in a time-bound manner.
THANK YOU