বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড

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Welcome to

Community energy resilience - framing the issues and identifying social metrics

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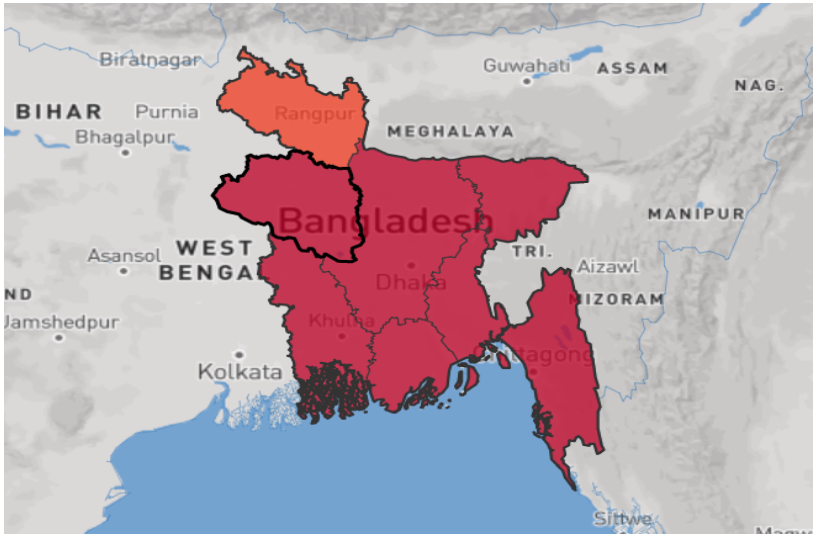
Contents

1) Key factors related to extreme weather conditions that impact on the distribution grid and rural electrification

1.1) Present day Bangladesh, due to its unique geographic location, suffers from devastating tropical cyclones frequently.

1.2) There is more than a 20% chance of potentially-damaging wind speeds in Bangladesh in the next 10 years and Bangladesh is selected as high hazard area (red color on map)

Source: http://thinkhazard.org/en/report/23-bangladesh/CY



1.3) **80 Palli Bidyut Samity (Co-operative) in 61 districts - BREB command area (approx. 77% of total people and demand is 53% of total load).**

1.4) Bagerhat, Pirozpur, Jhalakati, Barisal, Barguna, Patuakhali, Bhola, Satkhira, Khulna, Jessore, Narail, Gopalganj, Shariatpur, Lakshmipur, Chandpur, Noakhali, Feni, Chittagong and Cox's Bazar.= **19 coastal districts**

1.5) **21 Palli Bidyut Samity (Co-operative) in 19 coastal districts**

1.6) Usually the following **types of extreme weather** are in Bangladesh

1. Heavy **rainfall** with gentle winds –all over Bangladesh
2. Seasonal **storms like Kalboishakhi (Nor'westers)** etc –all over Bangladesh
3. Thundering
4. **Cyclones**- usually hit in coastal areas.
5. Increase **Flood Water** to higher level in 2017–in northern part of Bangladesh

1.7) BREB's most of the distribution networks are in rural areas beside/ through the trees and relatively longer in km.

The following **impacts** on distribution networks have to be faced :

1.7.1. Heavy rainfall with gentle winds and seasonal storms –

a) Trees' branches touch the electric lines that make different faults

b) When trees are broken down on the electric lines **tear up** the conductors & shield ware, **damage** insulators, poles, cross-arms etc

1.7.2. Thundering – crack some insulators, damage Lighting Arrestors, etc.

1.7.3. **Tropical Cyclones** like Sidr (November 15, 2007), Aila (May 23, 2009), Mahasen (May 16, 2013), Roanu (on May 19, 2016) etc. - usually destroy almost the whole networks.

Sidr is one of the worst natural disasters in Bangladesh. It affected in **29** Palli Bidyut Samities (PBSs), among them **7** nos. of PBSs namely **Bagerhat, Pirojpur, Patuakhali, Barisal-1, Barisal-2, Jhalakati and Madaripur** are mostly affected. It destroyed the following BREB's distribution network :

- Poles broken	: 7049 nos.
- Displaced aligned poles	: 33,890 nos.
- Re-stringing of lines	: 2, 681 km
- Transformer damaged	: 680 Nos.
- Service connection reestablishment	: 30, 620 Nos.
- Restoration cost	: 45 Cr. BDT (7 Million USD)

- Sales of electricity after Sidr in Pirojpur PBS as example:

SL	Month	In Lac kWh	In Cr. BDT
i	Oct, 07 (before Sidr)	46.11	1.77
ii	Nov, 07 (Hit on mid Nov)	34.64	1.37
iii	**Dec,07 (after Sidr)**	**9.18**	**0.39**
iv	Jan, 08	23.82	0.95
v	Feb, 08	32.77	1.31
vi	Mar, 08	36.16	1.45
vii	Apr, 08	38.53	1.52
viii	May, 08	39.01	1.52

So, **Primary restoration period was about 7 months** and **permanently** it needs about **one and half years**

1.7.4. **Increase of flood water to a higher level in 2017** - unable to pass through and getting stagnant, electricity lines are rising to a higher risk.

13 nos. of PBSs (Cooperatives) electricity had to be shut down.

4200km of distribution networks need to increase the clearance (ground to phase)- still now this is pending to be done. **But message is that, this is not limited to 4200 km (?).**

2) Measures are being taken to protect the distribution network:

BREB is doing regularly the following works to protect the distribution networks-

2.1 **Right of way completion** through trimming trees' branches as a routine work

2.2 **Routine maintenance** of equipments and protection devices

2.3 During Cyclone - H/Q office, zonal office, sub-zonal office, complain canters wise **line crews are being ready for restoration** the network after Cyclone. Sometime additional workforce engaged from the other zones

3) What more needs to be done?

3.1) Protection from Heavy Rainfall with gentle winds, Seasonal storms etc.:

3.1.1 Involvement of local people through **developing some apps**, so that they can inform about **any irregularities in networks –if they know**, or **they are out of electricity supply** etc.

3.1.2 Some new thing - if possible, like **covering insulation jacket around the existing bare conductor** without replacing it

3.1.3 Development of **SCADA** system gradually.

3.2) Protection from the Cyclones:

3.2.1 It requires a careful analysis to understand the nature of the risk and identify the areas at high risk through

- **Actual outage statistics** of all PBS zones and
- Restoration cost

3.2.2 Identify areas of the network that require **stronger poles**, **more number of wind guys**, **under ground cabling (?)** etc.

3.2.3 Develop a **regulatory standard fo**r network design that recognizes the risk of damage from extreme weather conditions

4) **Conclusions:**

4.1 After all, **measures to protect** distribution networks of BREB against extreme weather conditions remains **unsolved till today**.

4.2 We are **looking for** a comprehensive study **addressing the risks** as well as identifying **its probable solutions**

4.3 So, I would like to request the **Asian Development Bank (ADB) and the concerned** to look at it

Thanks