



**SOUTH
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TOWARDS CLIMATE RESILIENCE



Mobilising Investment for NDC Implementation in Bangladesh

Webinar: April 2020

Supported by:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

based on a decision of the German Bundestag

Bangladesh's NDC ambitions

Bangladesh's contribution to global climate action

- **Exceptionally vulnerable** to the impacts of climate change
- Conditional commitment to reduce emissions by **15% from BaU by 2030**

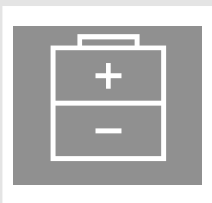
Renewable energy opportunities

- 2020 target to increase the share of renewable energy production up to **10% of the total energy mix**
- To reduce **costs of importing energy**
- **Cost effective**, pragmatic solution for providing electricity to off-grid areas



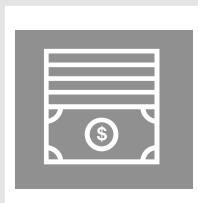
Our approach in Bangladesh

Phase 1



Country scoping studies to identify priority sub-sectors. **Energy** is selected as target sector for reducing emissions

Phase 2



Business models and investment cases built for solar mini grids, solar irrigation pumps (SIPs) and solar boats and policy recommendations

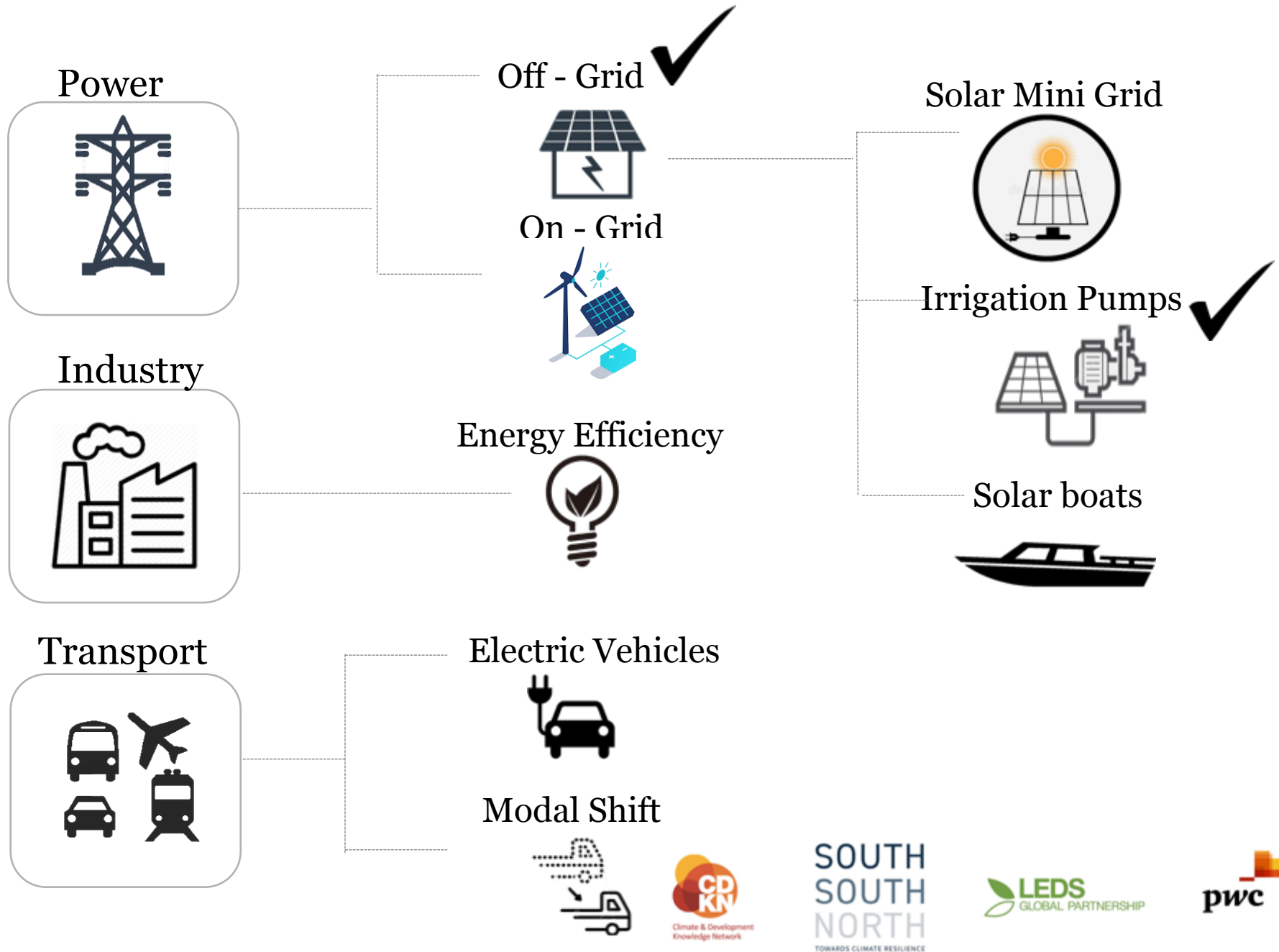
Phase 3



Geospatial mapping tool developed to identify priority sites to roll out SIPs



Sector selection approach and stakeholder engagement



Phase 2 Interventions

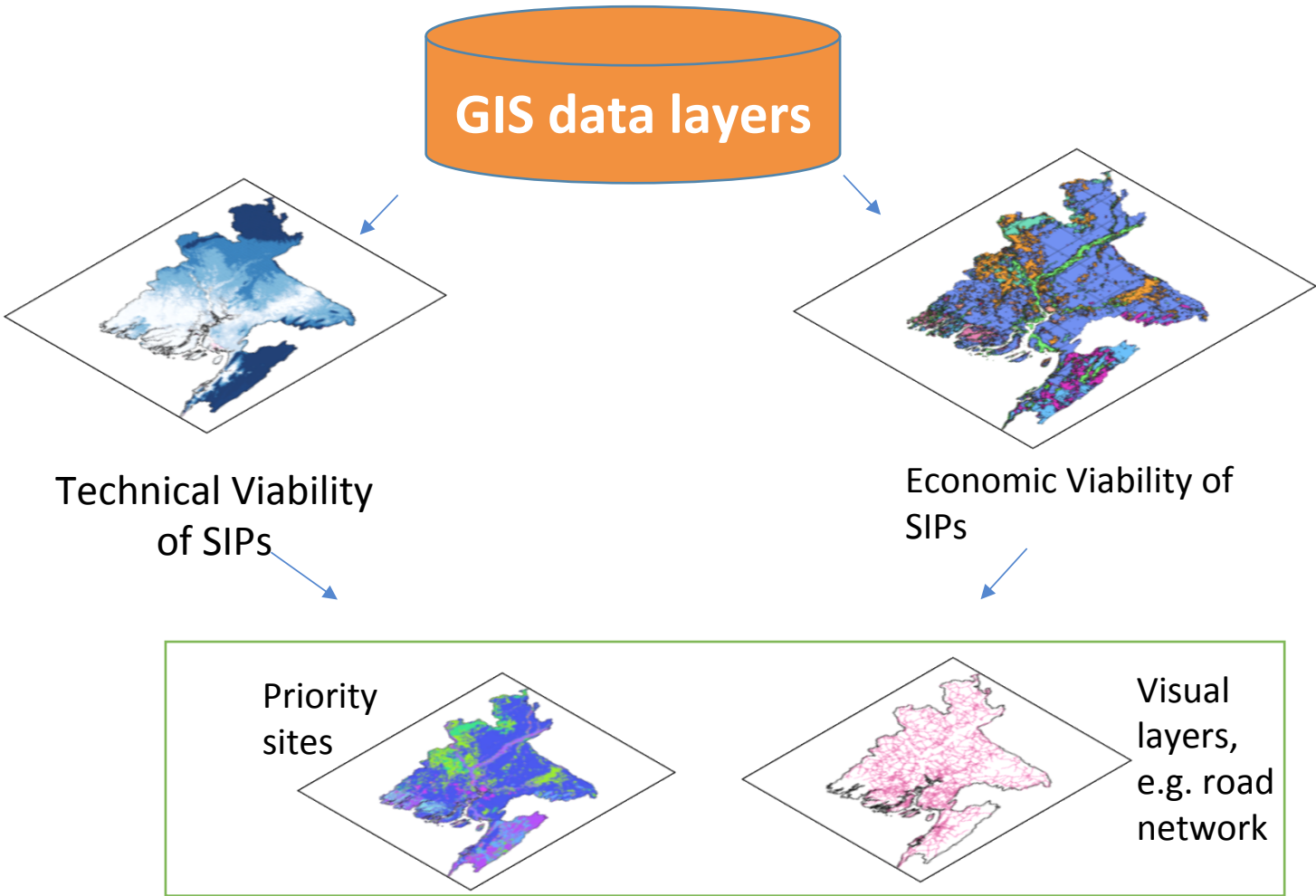
Sectors and progress to date:

- Off grid solar energy selected



	Mini Grids	Irrigation Pumps	Boats
Project outputs			
Study of barriers to market development			
Intl. examples of tech upscale			
Business models with short term improvements			
Investment cases for various stakeholders			
Policy and regulatory recommendations to GoB			

Phase 3 interventions: Mapping tool



Data collection

Bangladesh GIS data - model and calibration
Solar radiation intensity
Topography
Groundwater depth
Salinity
Arsenic
Agricultural crops and yields
Existing irrigation pumps
Population density
Electricity Grid



National experience and programmes
Sustainable and Renewable Energy Development Authority (SREDA)
Infrastructure Development Company Limited (IDCOL)
Bangladesh Agricultural Development Corporation (BADC)
Power division
Private sector investors and operators
Engineering, agriculture and economics literatures
International organisations

Visualisation

SIP attractiveness rating

Map view

Select a specific upazila:

(All)

Search by Cell ID:

(All)

Guidance

Pump costs:

Present - it is assumed that pump costs are those estimated for a standard SIP installed in Bangladesh under current component prices

Alternative - the cost of the pumping system, PBV modules and pump controllers are reduced by 42% to reflect expectations on cost reductions in the future

Surplus power tariff:

Present - it is assumed that the power remaining after usage for irrigation can be sold back to the grid at 2.5 BDT per kWh

Alternative - the sell back tariff is increased to 3.5 BDT/kWh

Crop switch:

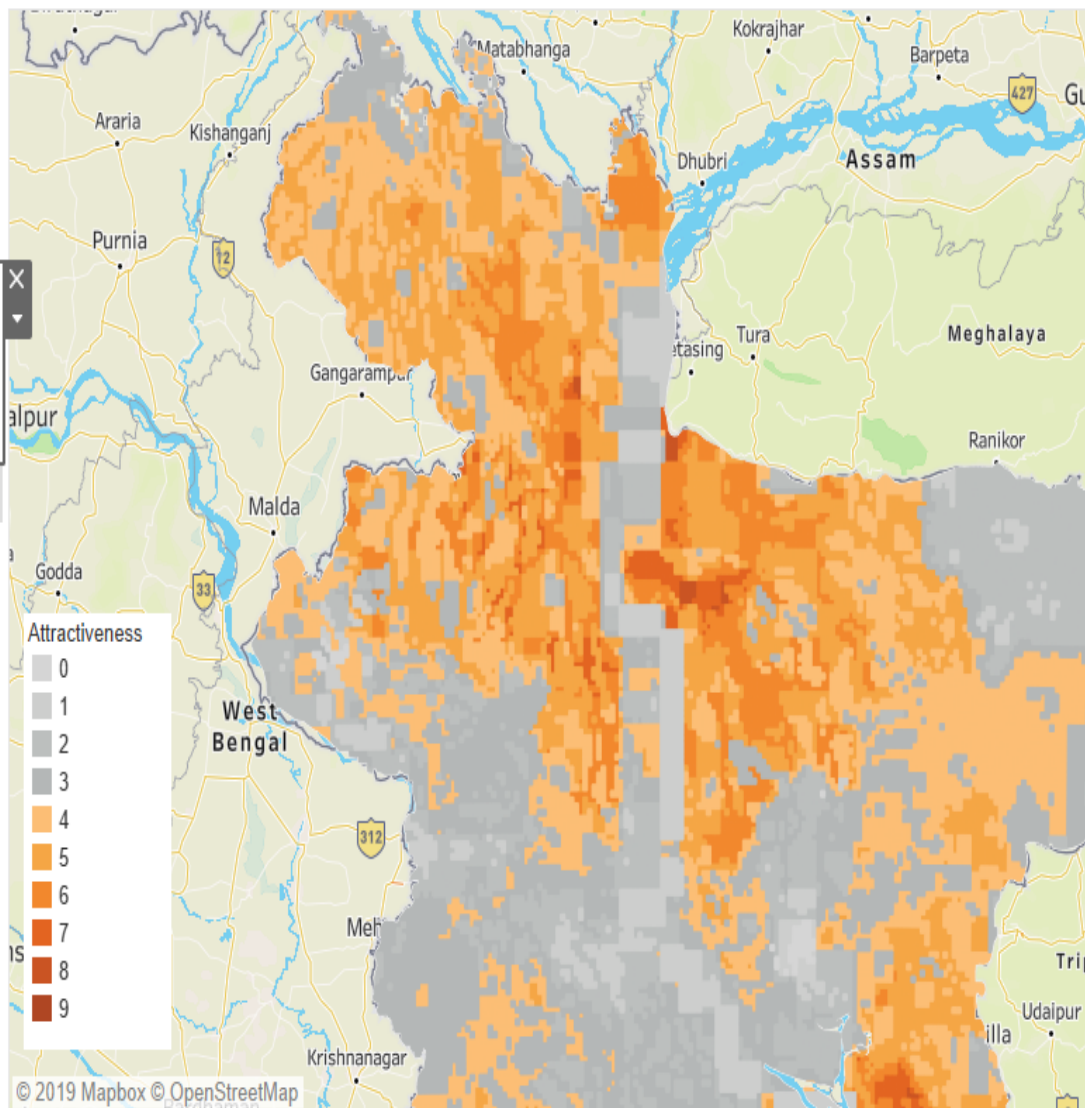
Present - it assumes that the crop patterns are the same as those captured when this tool was created

Alternative - a portion of the land currently used to cultivate boro crop changes to maize or wheat, the degree of switching depends on the suitability in that cell for each of the alternative crop types

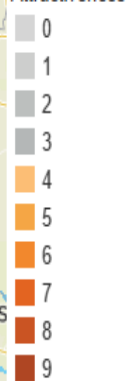
Irrigation price:

Present - it is assumed that irrigation prices are approximately the mid-point of observed IDCOL prices for each crop type per acre per season: 2,500BDT - boro, 800BDT - aman, 800BDT - aus, 1000BDT - maize and 800BDT - wheat

Alternative - it is assumed that the prices are at the top end of observed IDCOL prices per acre per season: 3000BDT - boro, 1200BDT - aman, 1200BDT - aus, 1250BDT - maize and 1200BDT - wheat



Attractiveness



© 2019 Mapbox © OpenStreetMap

SIP attractiveness rating:

- ☒ Irrigation only
- ☐ With sale of surplus power to grid
- ☐ With sale of surplus power to households

Future condition switches:

Pump costs

- ☒ Present
- ☐ Alternative

Surplus power tariff

- ☒ Present
- ☐ Alternative

Crop Switch

- ☒ Present
- ☐ Alternative

Irrigation prices

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PwC

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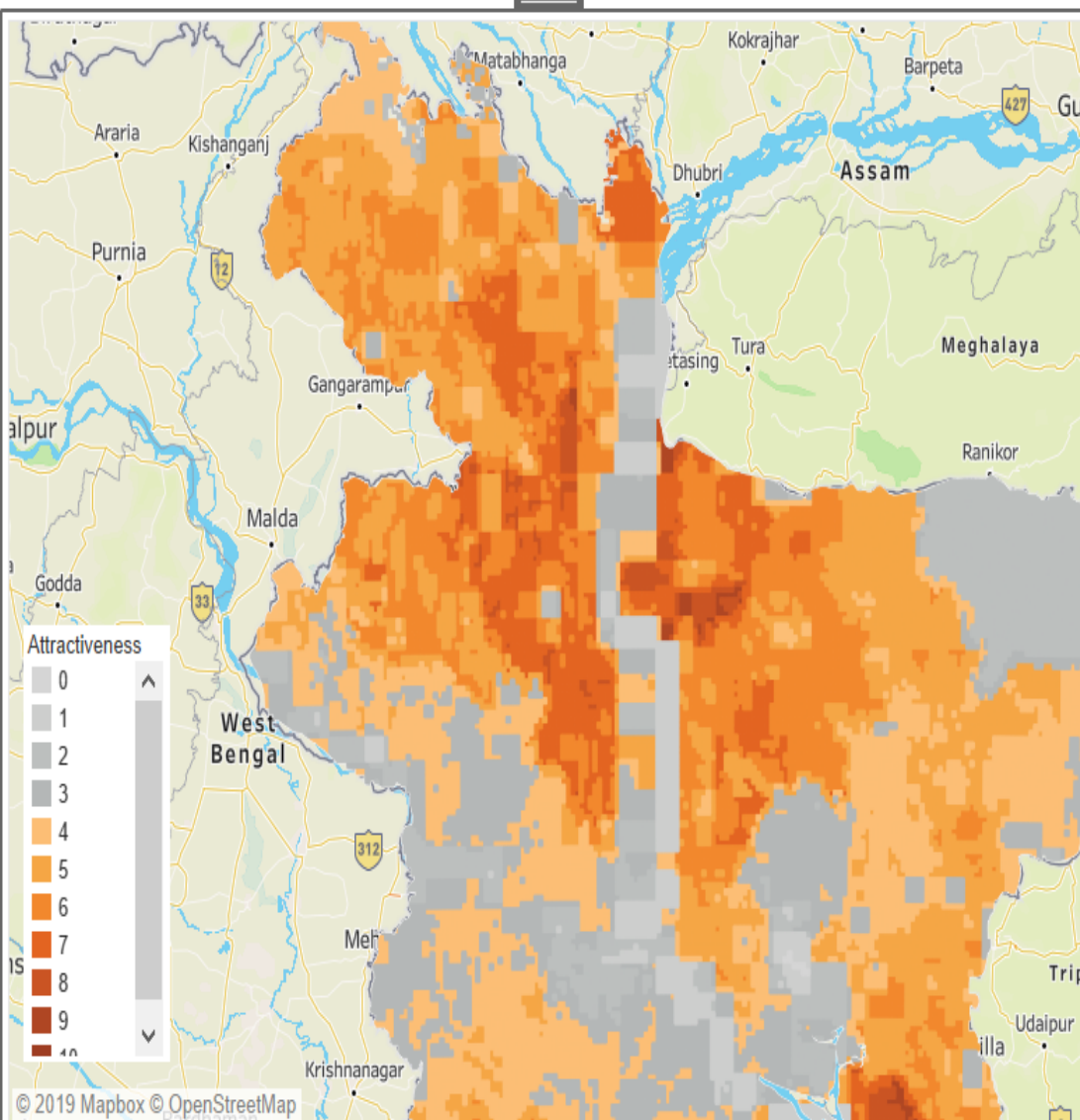
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Crop Switch

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Visualisation

Future condition switches - crop switch and irrigation prices on

Map view

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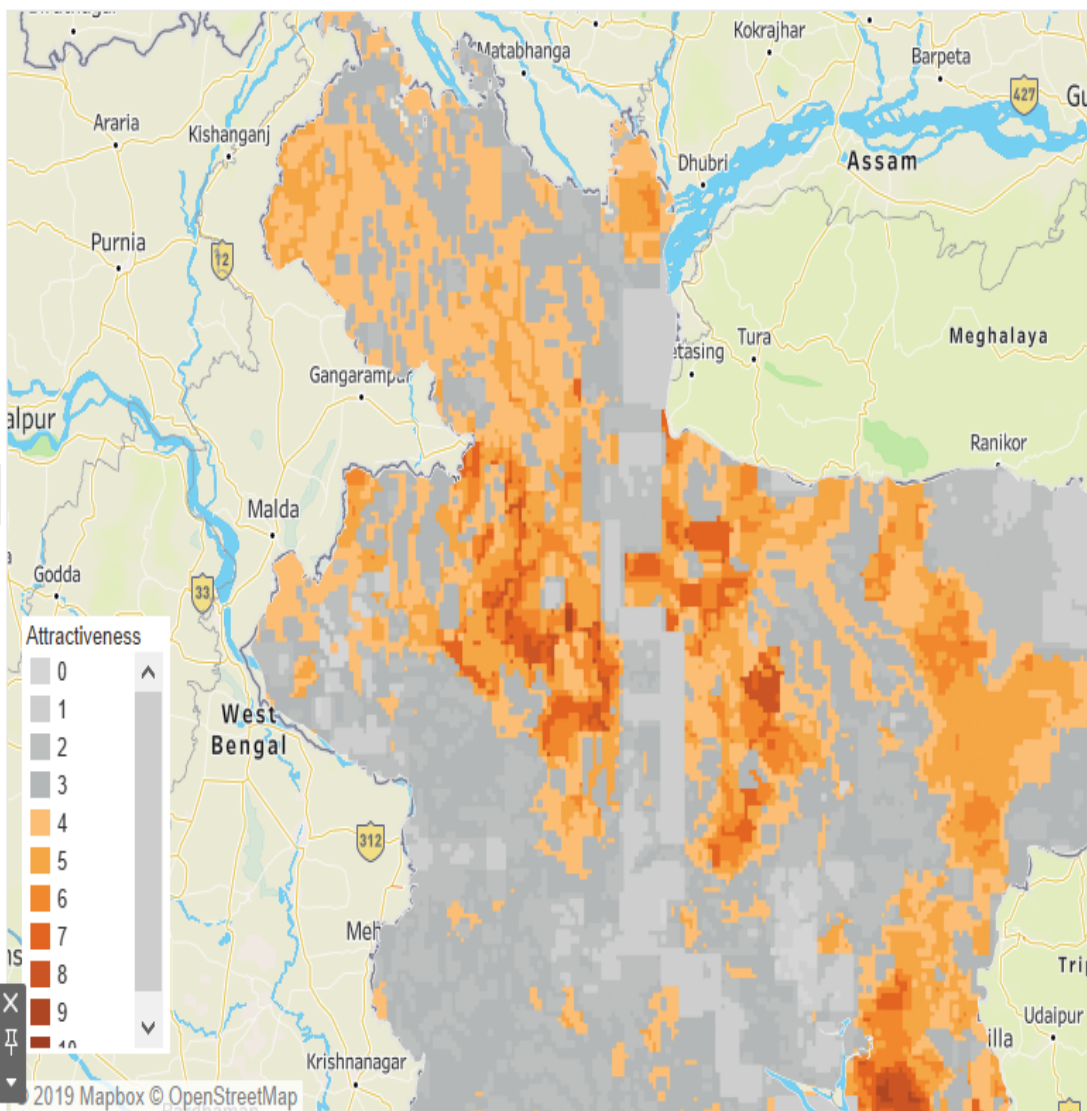
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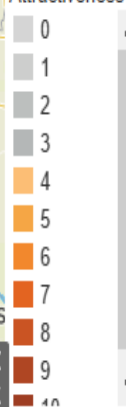
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Impacts and benefits of our work

Investment barrier	How is this addressed by this work?
Low utilisation of SIPs outside of the main BORO irrigation season	Increases understanding on utilising surplus power outside of the BORO seasons
Mismatch between project cash flows and debt service obligations	Opens up new revenue generating options with predictable cash flows
Low uptake of SIPs by farmers	Opening up sale of power back to the grid increases the overall attractiveness of SIPs to farmers
High investment and operation costs	Opens up new revenue generating options for SIPs

Key Outcomes



Increased private sector awareness of investment opportunities and incentives in off-grid solar



Business models developed and interest for application registered for a broad pipeline of off-grid-solar energy projects



Consensus from stakeholders on the recommendations given in the implementation road-map for an investment mobilization, as well as momentum for immediate action



Opportunity for networking and information exchange for investors, policy makers, and financiers on investment opportunities and enabling environment



Replication of methodology in different contexts - work with PwC India and other teams globally

Learning

- Solar mini grids and irrigation pumps are mostly sourced through public sector budget or development partners; funding and financed through government's infrastructure company (IDCOL's) grant-loan-equity financing schemes
- Limited private sector engagement on off grid solar energy sector because:
 - Lack of awareness of investment opportunity
 - Concerns regarding grid expansion
 - Low tariff structures offered by IDCOL
 - Seasonality of irrigation demand
 - Lack of regulations for sale of surplus power.
- Solar boats is a nascent technology that needs multiple pilot demonstrations and technical design studies before it can be deployed in market
- Rate of returns can be improved by using sensitive and robust analysis as part of pre-investment decisions
- Internal programmatic learning on frequency, consistency and type of engagement with key stakeholders

THANK YOU

