Presentation on business models for solar irrigation in Bangladesh and India

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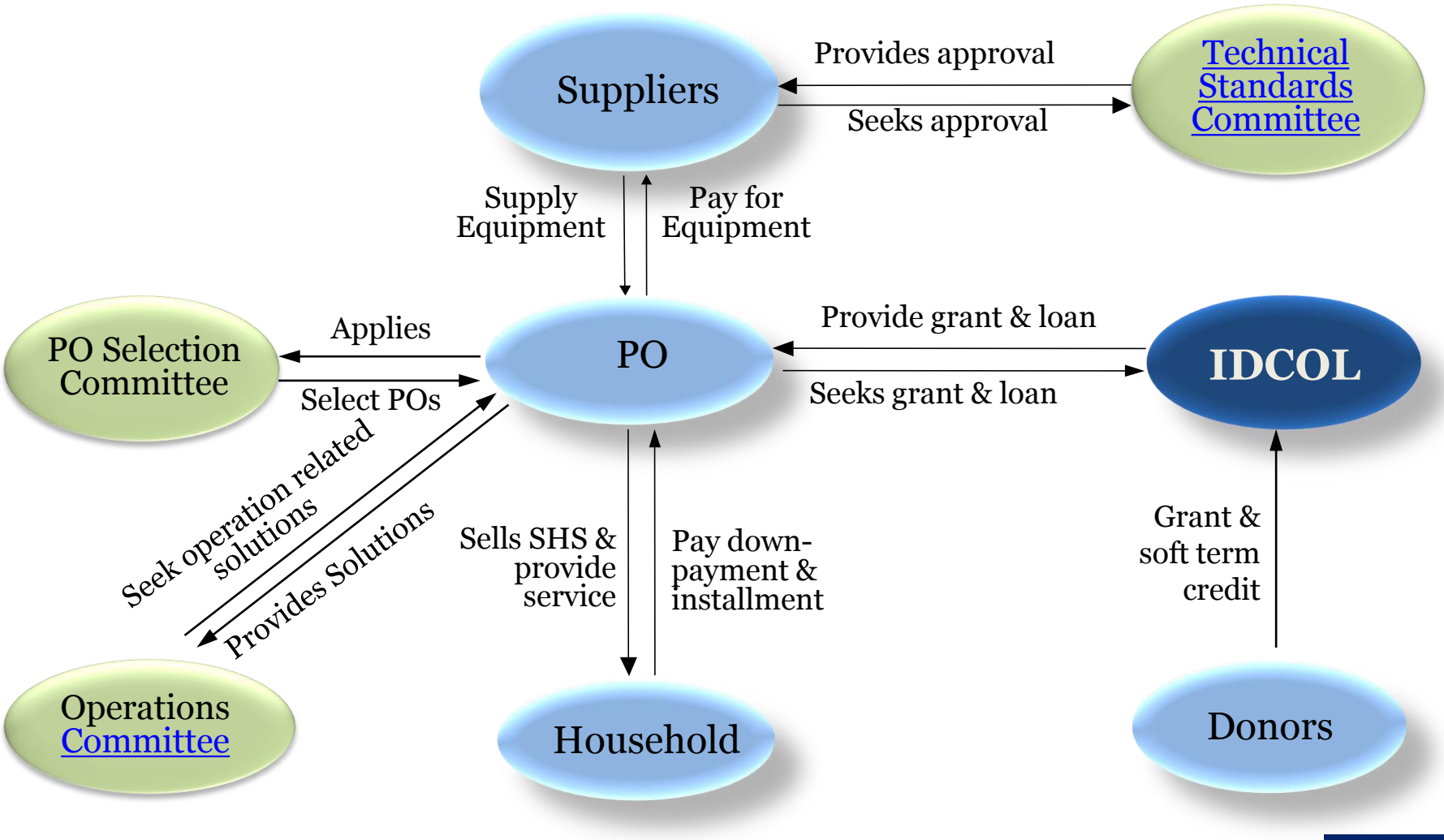
Two projects to be presented:

1) IDCOL's Solar Irrigation Program
2) 2 Models for Punjab's Solar Agri Pump Program

Renewable Energy Initiatives Supported by IDCOL

Project/Program	Target	Achievements as of December 2014
SHS Program	6 million SHS by 2018	3.5 million
Domestic Biogas Program	100,000 biogas plants by 2020	36,000
Solar Irrigation Program	1,550 solar agricultural pumps by 2017	124
Solar Mini-grid	50 solar mini grids by 2017	4
Solar Powered Telecom Base Transceiver Stations (BTSs)	as per demand	138
Biogas-based Electricity Project	130 biogas-based power plants by 2017	5
Improved Cooking Stove Program	1 million cooking stoves by 2018	recently launched

Program Structure



Solar PV Based Irrigation Pump Program

- **Target :** 1,550 solar irrigation pumps by 2017 (17 MW)
- **Savings :** 5,100 tons of diesel per year equivalent to Taka 410 million ($5.2 million)
- **Beneficiaries :** 30,000 farmers
- **Average capacity :** Pump - 7 kW, Panel – 11 kWp
- **Average water flow:** 750,000 liters/day
- **Status:** 223 approved, 102 installed and 250 in the pipeline

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Financing Structure

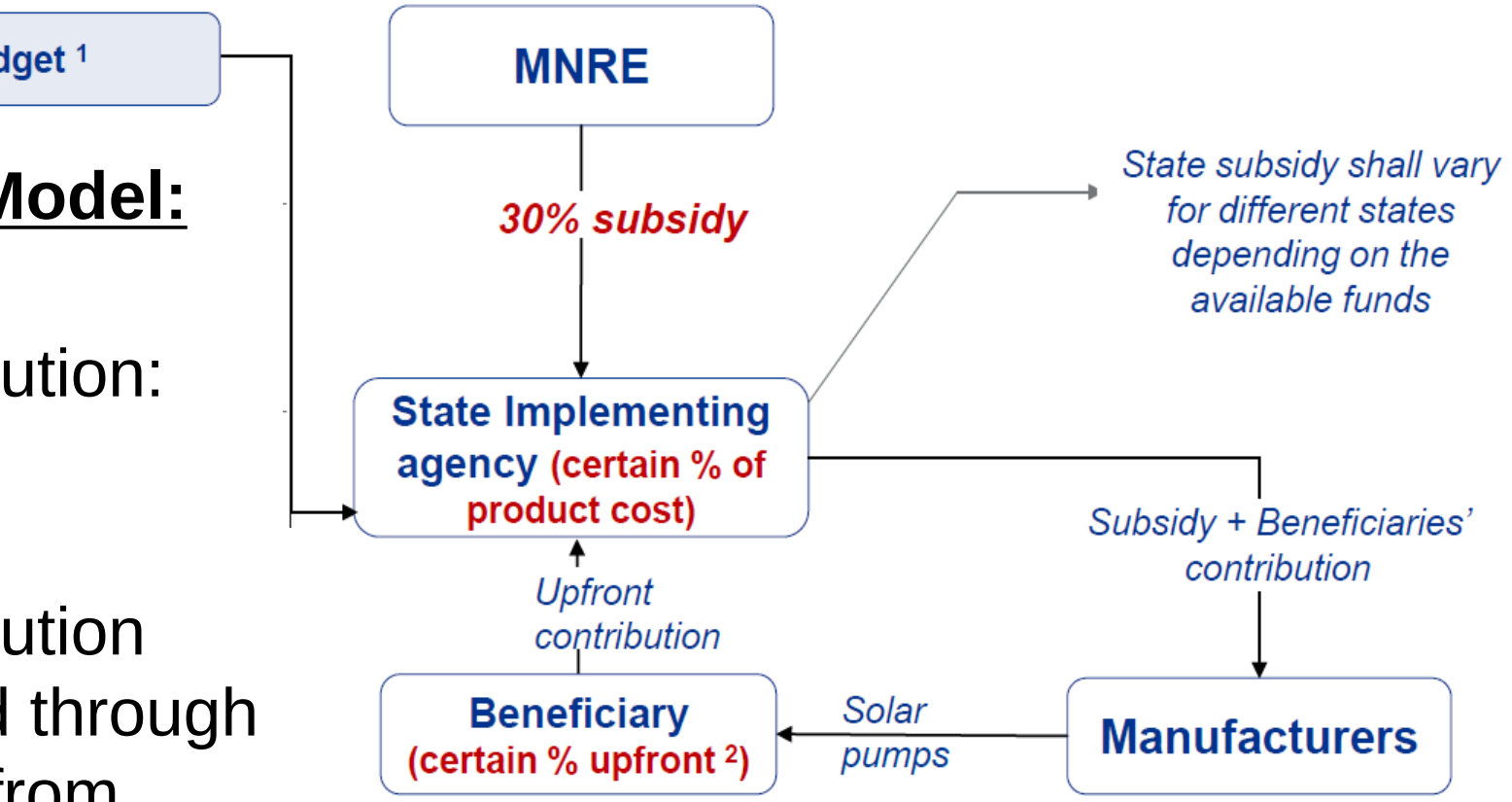
Project cost	USD 31,343
Grant amount (40% of project cost)	USD 12,537
Remaining Cost	**USD 18,806**
IDCOL Loan (40 % of project cost)	USD 12,537
Equity participation by the sponsor (20% of project cost)	USD 6,269

Financing terms	
Loan amount	USD 12,537
Loan Tenor	8 years (9 months grace)
Interest rate	6%
Principal repayment	29 equal quarterly installments
Security	Bank guarantee or land mortgage

Option 1: Conventional Model

Punjab Model:

- Farmer Contribution: 14%
- PEDA Contribution (funded through a loan from ADB): 56%



1. State may be flexible to look at integrating various schemes and leveraging subsidy from other schemes
2. The Beneficiary contribution shall vary depending on the contribution made by State. The beneficiaries' contribution can increase due to benefits from integration of scheme

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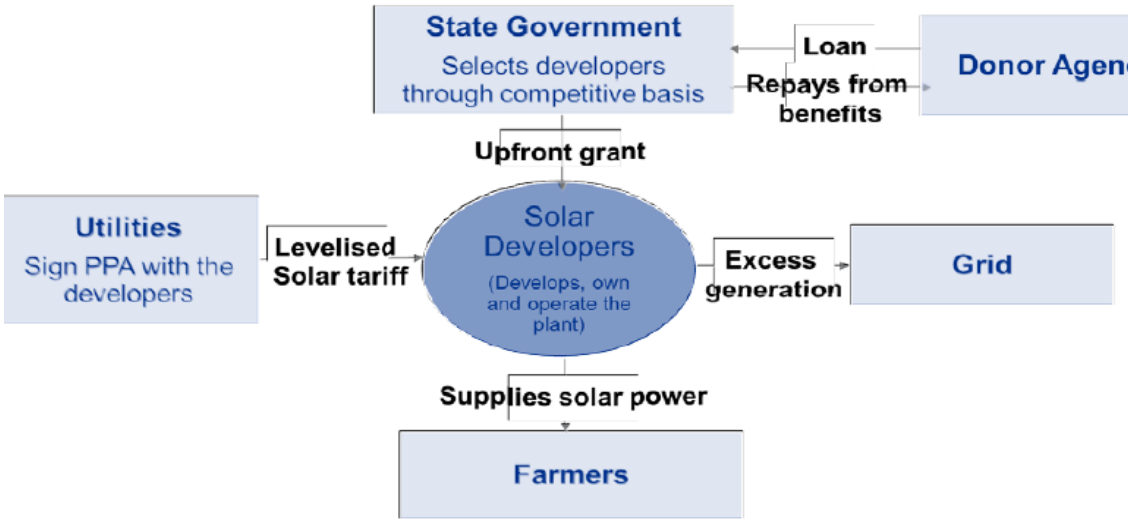
Model 2: Feeder Level Distributed Supply of Solar Power for Agricultural Pumps



- Setting up small (KW scale) solar power array of panels at the feeder level by appointed developers and provision of power to agriculture pumps.
- As all the pumps need not be operational at the same time, the array of panels can be optimized. Example – Array of ~35 KW would service 10 pumps whereas 10 individual pumps would have required 70 KW

- State Government provide upfront Viability Grant Funding (VGF) to the developers and the Tariff can be fixed for a period of 25 years.
- The State Government shall take loan for the amount of VGF provided to the developer. This VGF will reduce the tariff to existing grid levels.
- The loan repayment will be based on benefits due to tariff difference between conventional power tariff and levelised solar power tariff during subsequent years

Conclusion

- **Affordability barrier**: Overcoming the affordability barrier by providing long-term access to finance to households/farmers and grants by the state and/or development partners plays an important role
- **Financing model**: Determine the appropriate finance structure is key in successfully adopting (renewable) technology and ensure wide diffusion
- **Sustainability**: Ownership and partnership, nation-wide sales distribution, warranty and maintenance branch networks ensures long-term success
- **Sustainable groundwater use initiatives:** Linkage to agricultural efficiency improvement initiatives to encourage efficient groundwater utilization techniques (such as direct seeding, raised-bed farming, and use of tensiometers) by farmers in the program's areas are of critical importance

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