Minutes of Technical Committee meeting held in the Office Chamber of Addl. Chief Secretary & APCto the Govt. of Assam, D' Block, 1st floor, Assam Secretariat, Dispur on 20.04.2017 at 03:00 PM

List of officers present is enclosed at Annexure –I.

The meeting was presided by Sri. Amlan Baruah, IAS, Commissioner & Secretary, Govt. of Assam, Agriculture Department, Dispur & Member of the Technical Committee authorised by the Addl. Chief Secretary & APC to the Govt. of Assam & Chairman of the Technical Committee in the Office Chamber of Addl. Chief Secretary & APC to the Govt. of Assam, D' Block, 1st floor, Assam Secretariat, Dispur on 20.04.2017 at 03:00 PM. At the outset, he welcomed all the Members of the Technical Committee present in the meeting and briefed purpose of the meeting.

Sri. K. K. Choudhury, Chief Engineer (Agriculture) and Member Secretary of the Technical Committee addressed the house with the agenda of the meeting.

Agenda point 1: "To recommend probable Farm Machineries & Equipment and their technical specification, to incorporate in different schemes for the year 2017-18".

In this regard, he placed a 'Draft list of Farm machineries & Equipment and their Technical Specification' before the house through Power Point Presentation for discussion and final recommendation by the house to incorporate in different schemes for the year 2017-18.

After threadbare discussion the members suggested some modifications in the technical specification of the following items:

a) The Tractor Trailer Type may be considered as: Two wheeled tipping or non tipping type matching trailer made of mild steel with provision of spring leaf and hitching arrangement.
b) Valid COP & CMVR shall be produced by the manufacturers/ dealers/ suppliers before respective scheme implementing officer at the time of procurement of Power-tiller as per Govt. of India letter No. (i) No. 13-2/2014-M&T (I&P) dtd. 04/11/2016 and (ii) No. 13-2/2014-M&T (I&P) dtd. 23/12/2016
c) In Automatic Mat-Type Rice Nursery Sowing machine, FMTTI tested machineries may be preferred.
d) A planter for maize crop may be added to the list which will cater demand from farmers of maize growing area of the State.
e) Regarding specification of Diesel Pump-sets, Electrical Pump-sets, Sprinkler Irrigation set, Mobile Rain-gun Sprinkler, Drip Irrigation set etc., the machinery or the components must have ISI markings rather than only BIS certification.
f) In processing machinery like Dry Maize Milling Plant, Ginger Processing Unit, Spice Processing Unit etc. power requirement may be added in the specification.

After above modification the house recommend the probable Farm machineries & Equipment and their technical specification, to incorporate in different schemes for the year 2017-18 as enclosed herewith at **Annexure-II**

Agenda point 2: "To recommend/ suggest whether to go for FOE for shortlisting of Dealer/ Brand/ Model/ Price of machineries or to extract & verifying Dealer/ Brand/ Model/ Price of machineries from Farmers' Portal: www.farmer.gov.in for procurement by farmers in DBT mode".

In this regard the house recommend as follows:

a) Machinery to be procured by beneficiary as per their choice of Dealer/ Brand/ Model/ Price of machineries from Farmers' Portal: www.farmer.gov.in in compliance with the approved technical specification subject to provision available in the Portal and extract real time screenshot from the Portal during procurement for verification.
b) FOE may be published for shortlisting of Dealer/ Brand/ Model/ Price of machineries for which there is no provision in the portal.

Agenda point 3: "To notify a Committee for scrutiny and approval of any "Detail Bid document with T&C" prepared by the Directorate of Agriculture for procurement of any Farm Machineries & Equipment prior to publishing of same".

In this regard the house recommend to constitute a team of members for scrutiny and approval of "Detail Bid document with T&C" prepared by Directorate of Agriculture for any Farm Machineries & Equipment with the following members:

1) Sri. A.K. Upadhay, Sr. Agricultural Engineer - Member
2) Sri. A. K. Bhuyan, Superintending Engineer, H.Q. - Member
3) Sri. Nabnit Saikia, Sr. FAO, Directorate of Agriculture - Member

The meeting concluded with vote of thanks from the Chair.

Chairman, Technical Committee
Cum Commissioner and Secretary
to the Govt. of Assam, Agriculture Department
Dispur, Guwahati-06

ANNEXURE-I

Members Present in the TECHNICAL COMMITTEE MEETING held on 20-04-2017 at 03:00 P.M.

SN	Name	Designation	Signature
1	Shri. K.K. Mittal, IAS	Chairman & Addl. Chief Secretary & APC to the Govt. of Assam	
2	Shri. Amlan Baruah, IAS	Member & Commissioner & Secretary, Govt. of Assam, Agriculture Department	
3		Member & Commissioner & Secretary, Finance Department, Govt. of Assam or his representative	
4		Member & Secretary, Govt. of Assam, Agriculture Department	
5		Member & Secretary, Govt. of Assam, Irrigation Department	
6	Jeni Phukan Director, Agrwah	Member & Director of Agriculture, Assam	
7	K.K. Nagle, DIRECTOR	Member & Director, ~~Central~~ Farm Machinery Training Centre, Biswanath Chariali	
8		Member & Senior Financial Adviser, Agriculture Department	
9	K. K. Choudhury.	Member Secretary & Chief Engineer, Agriculture, Assam	20.4.17.
10			
11	A. K. Bhuyan	SE(A) Hqtr.	20/4
12	K.K. Nagle	DIRECTOR	20/4/17
13	A. K. UPADHYAY	Senior Agricultural Engineer	20/4/17
14			
15			
16			
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Annexure-II

Probable list of Farm Machineries &Equipment and their Technical Specifications for the year 2017-18

SN	Particular of machineries	Technical Specification
(1)	*(2)*	*(3)*
1	**Tractor** (18 to 25 PTO HP) with matching implements Trailer, Cage Wheel and standard tools & accessories	A) **Tractor:** i) Type: Agricultural Tractors (18 to 25 PTO HP) with cage wheels and standard accessories viz. trailing hook, stabilizer assembly, hitch assembly, hood, tool kit etc. ii) CMVR certified iii) Tested at CFMTTI, Budni (MP) B) **Trailer:** i) Type: Two wheeled tipping or non-tipping type matching trailer made of mild steel with provision of spring leaf and hitching arrangement. ii) Capacity (Ton): 1.5 to 2 iii) MS sheet thickness : (a) sides(mm): 2.5 or more (b) bottom(mm): 4 or more iv) Hydraulic brake system as per AIS:043-2005 C) **Cultivator:** i) Type: Matching Rigid Tyne Cultivator, having 3- point hydraulic linkage ii) No. of Tynes: 6 to 9 iii) Tested at any FMTTI or GoI approved Institution. D) **Disc Harrow:** i) Type: Matching Offset Type Disc Harrow, having 3- point hydraulic linkage ii) No. of Discs: 6 to 12 iii) Tested at any FMTTI or GoI approved Institution. E) **Rotavator:** i) Type: Matching Gear type Rotavator ii) No. of Blades: 18 to 30 iii) Tested at any FMTTI or GoI approved Institution.
2	**Tractor** (above 25 to 45 PTO HP) with matching implements Trailer, Cage Wheel and standard tools & accessories	A) **Tractor:** i) Type: Agricultural Tractors (above 25 to 45 PTO HP) with cage wheels and standard accessories viz. trailing hook, stabilizer assembly, hitch assembly, hood, tool kit etc. ii) CMVR certified iii) Tested at CFMTTI, Budni (MP) B) **Trailer:** i) Type: Two wheeled tipping or non-tipping type matching trailer made of mild steel with provision of spring leaf and hitching arrangement. ii) Capacity (Ton): 2 to 3 iii) MS sheet thickness : (a) sides(mm): 2.5 or more (b) bottom(mm): 4 or more iv) Hydraulic brake system as per AIS:043-2005

		C) **Cultivator:** i) Type: Matching Spring Tyne Cultivator, having 3- point hydraulic linkage ii) No. of Tynes: 9 to 13 iii) Tested at any FMTTI or GoI approved Institution. D) **Disc Harrow** i) Type: Matching Offset Type Disc Harrow, having 3- point hydraulic linkage ii) No. of Discs: 12 to 16 iii) Tested at any FMTTI or GoI approved Institution. E) **Rotavator** i) Type: Matching Gear type Rotavator ii) No. of Blades: 30 to 54 iii) Tested at any FMTTI or GoI approved Institution. F) **Disc Plough** i) Type: Matching Disc Plough, having 3- point hydraulic linkage ii) No. of Bottoms: 2 or 3 iii) Tested at any FMTTI or GoI approved Institution
3	**Power tiller** (8 BHP and above)	i) Type: Power Tillers (8 BHP and above) with cage wheel, standard tools and accessories ii) Updated C.O.P. and C.M.V.R. certificates iii) Tested at any FMTTI
4	**Leveller**	i) Type: Land Leveller/ Leveller Blade, having 3- point hydraulic linkage ii) Power source: Tractor (25 - 45 PTO HP) iii) Tested at any FMTTI or GoI approved Institution.
5	**Laser Land Leveller**	i) Type: Laser Guided Land Leveller ii) Operating range (m): 600 – 800 iii) Power source: Tractor (above 40-45 PTO HP) iv) Tested at any FMTTI.
6	**Ridger**	i) Type: Ridger for sugarcane and potato cultivation ii) Power source: Tractor (25 - 45 PTO HP) iii) Tested at any FMTTI or GoI approved Institution.
7	**Ditch maker**	i) Type: Tractor drawn ditch maker ii) Power source: Tractor (above 25 - 45 PTO HP) iii)Tested at FMTTI or GoI approved/ designated testing Centre
8	**Bund Former**	i) Type: Tractor drawn Bund Former ii) Power source: Tractor (25 - 45 PTO HP) iii) Tested at any FMTTI or GoI approved Institution.
9	**Zero till seed cum fertilizer drill**	i) Type: Tractor drawn Zero till seed cum fertilizer drill ii) Power source: Tractor (35 - 45 PTO HP) iii) No. of rows: 9/11/13 iv) Tested at any FMTTI or GoI approved Institution.
10	**Seed Cum Fertilizer Drill**	i) Type: Tractor drawn multi crop seed cum fertilizer drill ii) Power source: Tractor (above 25 - 45 PTO HP) iii) No. of rows: 9/11/13 iv) Tested at any FMTTI or GoI approved Institution.

11	**Pneumatic Multi-crop Planter**	i) Type: Tractor mounted Pneumatic multi crop planter to plant seeds of maize, mustard, ground-nut etc. ii) Power source: Tractor (above 25 - 45 PTO HP) iii) No. of rows: 4/5/6 iv) Tested at any FMTTI or GoI approved Institution.
12	**Automatic Potato Planter**	i) Type: Tractor drawn Automatic Potato Planter ii) Power source: Tractor (35 - 45 PTO HP) iii) Tested at any FMTTI or GoI approved Institution
13	**Tractor operated Potato Digger**	i) Type: Tractor PTO operated Potato Digger Elevator ii) Power source: Tractor (35 - 45 PTO HP) iii) Tested at any FMTTI or GoI approved Institution.
14	**Tractor mounted Vertical Conveyor Reaper**	i) Type: Tractor front mounted or Rear (Offset type) mounted Vertical Conveyor Reaper for harvesting and windrowing of Paddy. ii) Power source: Tractor (35 - 45 PTO HP) iii) Tested at any FMTTI or GoI approved Institution.
15	**Walk-behind type Rice Transplanter**	i) Type: Self Propelled Walk behind type Rice Transplanter ii) Fuel: Petrol/ Diesel iii) No. of planting rows: 4 iv) Tested at any FMTTI
16	**Riding type Rice Transplanter**	i) Type: Self Propelled Riding type Rice Transplanter ii) Fuel: Petrol/ Diesel iii) No. of planting rows: 8 iv) Tested at any FMTTI
17	**Automatic Mat-Type Rice Nursery Sowing Machine**	i) Type: Automatic Mat-Type Rice Nursery Sowing Machine for in-line production of mat type Rice nursery for paddy transplanter, along with nursery trays and standard accessories and including installation & commissioning on turnkey basis. ii) Power: Single phase electric motor (50 Hz 220 V) iii) Efficiency (trays/hour): 600 - 800 iv) Sowing quantity (gm/tray): 65 - 150 v) Thickness of sub-soil (mm): 18 - 25 vi) Thickness of surface soil (mm): 3 - 9 vii) BIS certification of Electric motors viii) Tested at any FMTTI or GOI approved center shall be preferred.
18	**Self Propelled Reaper**	i) Type: Self propelled walk behind type Vertical Conveyor Reaper for harvesting and windrowing of Paddy. ii) Power (Kw): 2.2 - 3.7 iii) Fuel: Petrol/ Diesel iv) Cutting width (mm): 900- 1200 v) Tested at any FMTTI
19	**Power Weeder (below 2 BHP)**	i) Type: Self Propelled Engine operated Power Weeder ii) Power (BHP): below 2 iii) Fuel: Petrol/Diesel iv) Tested at any FMTTI
20	**Power Weeder (2 BHP & above)**	i) Type: Self Propelled Engine operated Power Weeder ii) Power (BHP): 2 BHP & above iii) Fuel: Petrol/Diesel iv) Tested at any FMTTI

21	**Tractor PTO operated Paddy Thresher**	i) Type: Tractor PTO driven Spike tooth Axial flow Paddy Thresher mounted on a chassis with pneumatic wheels. ii) Grain Loss: 0 – 5% iii) Power source: Tractor (above 25 - 45 PTO HP) iv) Tested at any FMTTI or GoI approved Institution.
22	**Power Paddy Thresher with prime-mover**	i) Type: Spike tooth Axial flow type Paddy Thresher mounted on a chassis with pneumatic wheels. ii) Power source (Diesel Engine) (Kw): 3 – 4 iii) Grain Loss: 0 – 5% iv) Completely fitted as one unit with Diesel engine (3 - 4 Kw) as prime-mover v) Tested at any FMTTI. vi) BIS certificate of Diesel Engine
23	**Portable power operated paddy thresher**	i) Type: Portable power operated paddy thresher with wire loop type threshing drum. ii) Power source (HP) : 1.0 – 2.0 (single phase electric motor) iii) Output capacity (q/hr): 3 to 5 iv) Tested at any Govt approved/ designated testing centre.
24	**Tractor PTO operated Multi crop Thresher**	i) Type: Tractor PTO operated Multi-crop Thresher for pulses, wheat, mustard etc. mounted on a chassis with pneumatic wheels. ii) Grain Loss: 0 – 5% iii) Power source: Tractor (above 25 - 45 PTO HP) iv) Tested at any FMTTI or GoI approved Institution.
25	**Mini Combine Harvester**	i) Type: Self Propelled Mini Combine Harvester for harvesting and threshing of paddy. ii) Rated Engine Power (Kw): 50 or less iii) Tested at any FMTTI
26	**Knapsack Sprayer**	i) Type: Manual Hand compression Knapsack Sprayer ii) Tank capacity (lit): 13 – 16 iii) Pressure chamber made of Brass. iv) Spray Lance made of Brass or Stainless Steel. v) Tested at any FMTTI or CIAE/FMTTI Junagadh or BIS certification.
27	**Power Knapsack sprayer**	i) Type: Petrol engine operated Power Knapsack Sprayer ii) Tested at any FMTTI or CIAE/FMTTI Junagadh or BIS certification.
28	**Battery operated Knapsack sprayer**	i) Type: Battery operated Power Knapsack Sprayer ii) Tested at any FMTTI or CIAE/FMTTI Junagadh or BIS certification
29	**Maize Sheller**	i) Type: Power operated Maize Sheller fitted with single phase electric motor ii) Power source (Single phase electric motor): 1.0 – 2.2 Kw iii) Shelling efficiency (%): 95 or more iv) Tested at any FMTTI or GoI approved Institution.
30	**Mini Rice Milling Unit**	i) Type: Installation of Mini Rice Milling Unit on turnkey basis consisting of- ii) Paddy Dehusker (Rubber Roll Sheller)-1 No. (a) Size of Rubber Roll- 4" Dia (b) Capacity -400kg/hr (paddy) iii) Emery Stone Polisher-1 No. (a) Size of Emery Stone-14" length & 4.5" Dia (b) Capacity-250 kg/hr (Rice) iv) 3 Phase 5 HP Electric Motor to power both Dehusker& Polisher-1 No. v) Complete fittings for both Dehusker& Polisher viz. Base Frame, Main Drive Pulley, V-Belt, PVC Bend/Pipe for outlets etc. vi) Complete Electric fittings upto and including Panel Board for both Dehusker& Polisher vii) Tested at any FMTTI or Govt. Institutions

31	**Mini Oil Expeller**	i) Type: Mini Oil Expeller for mustard with filter press and oil pump including installation and commissioning on turnkey basis. ii) Capacity (kg/hr) : 30-50 iii) Size of filter press : 12"x12"x12-plates iv) Power requirement (kw): 5 - 7.5 v) Fitted with Electric motor including Starter, Panel Board, foundation bolts etc. vi) BIS certification of electric motors vii) Tested at any Govt approved/ designated testing centre.
32	**Mini Dal Mill**	i) Type: Mini Dal Mill for splitting and de-husking of pulses with automatic arrangement of collecting husk & dust, dehusked pulses, un-dehusked pulses and brokens in separate containers and bags, complete with electric motor, standard fittings & accessories. ii) Capacity in single operation (Kg/hr): 80 or more iii) Power (Kw): 1.5 – 2.2 iv) Tested at any Govt. approved/ designated testing centre.
33	**Batch type Flat-Bed Dryer for Paddy**	i) Type: Batch type flat-bed dryer for drying raw paddy with standard fittings. ii) Drying Temperature (0C): 500 - 600 iii) Capacity (Ton/batch): 1 iv) Drying capacity (Ton/day): 3 Ton/day (for 12% moisture extraction) v) Fuel: Diesel/ Biomass vi) Accessories: Moisture meter, Safety device & Standard accessories vii) Tested at any Govt. approved/ designated testing centre
34	**Ginger Processing Unit for making Ginger Paste**	i) Type: Batch Type Ginger Processing Unit for making ginger paste in complete including installation and commissioning on turnkey basis. ii) Each unit shall consists of – (a)Washer (b)Peeler (c)Paste making machine (d)Weighing machine (e)Pouch Sealer iii) Capacity (kg/hr): 50-100 iv) Power requirement (kw): v) All contact parts made of stainless steel vi) BIS certification of electric motors
35	**Ginger Processing Unit for making Ginger Powder**	i) Type: Batch Type Ginger Processing Unit for making ginger powder in complete including installation and commissioning on turnkey basis. ii) Each unit shall consists of – (a)Washer (b)Peeler (c)Dryer (d)Pulveriser (e)Weighing machine (f)Pouch Sealer iii) Capacity (kg/hr): 50-100 iv) Power requirement (kw): v) All contact parts made of stainless steel vi) BIS certification of electric motors
36	**Dry Maize Milling Plant**	i) Type: Dry Maize milling plant in complete including installation and commissioning on turnkey basis. ii) Each unit shall consists of – (a)Maize Sheller (b)Hammer Mill or Pulveriser (c)Weighing machine (d)Pouch Sealer iii) Capacity (kg/hr): 50-100 iv) Power requirement (kw): v) BIS certification of electric motors

37	**Potato / Banana Chips making Unit**	i) Type: Batch type Potato / Banana Chips making Unit in complete with all fittings and accessories including installation and commissioning on turnkey basis. ii) Capacity: 100 - 200 kg per day iii) Power requirement (kw): iv) Each unit shall consists of following machines– a) Peeler b) Potato and Banana Slicer c) Hydro for potato chips d) Fryer e) Flavour mixing machine f) Weighing machine g) Pouch Sealer v) All contact parts made of stainless steel vi) BIS certification of electric motors
38	**Spice Processing Unit**	i) Type: Spice Processing Unit in complete with all fittings for medium to fine grinding of wide variety of spices including installation and commissioning on turnkey basis. ii) Each unit shall consists of – (a)Hammer Mill or Pulveriser (b)Weighing machine (c)Pouch Sealer iii) Capacity (kg/hr): 50-100 iv) Power requirement (kw): v) BIS certification of electric motors
39	**Diesel Pump-set for STW**	i) Type: Centrifugal Pump-set fitted with Diesel Engine for Shallow Tube Well (STW) ii) Prime-mover (Diesel Engine) (Kw): 3.0 – 3.7 (4.0 – 5.0 hp) iii) BIS certification. iv) ISI marking
40	**Diesel Pump-set for LLP**	i) Type: Centrifugal Pump-set fitted with Diesel Engine as Low Lift Pump (LLP) along with accessories. ii) Prime-mover (Diesel Engine) (Kw): 3.0 – 3.7 (4.0 – 5.0 hp) iii) Accessories: a) 1 (one) piece matching PVC Suction-pipe of 7.5 meter length. b) 1 (one) roll matching flexible PVC Delivery-pipe of 7.5 meter length. c) 1 (one) no. matching Foot-valve with necessary fixing clamp etc. iv) BIS certification. v) ISI marking.
41	**Electrical Pump-set for STW**	i) Type: Centrifugal Pump-set fitted with Electric motor for Shallow Tube Well (STW) ii) Prime-mover (Electric motor) (HP): 2.0 – 3.0 iii) BIS certification. iv) ISI marking
42(a)	**Electrical Pump-set for LLP**	i) Type: Centrifugal Pump-set fitted with Electric motor as Low Lift Pump (LLP) along with accessories. ii) Prime-mover (Electric motor) (HP): 2.0 – 3.0 iii) Accessories: a) 1 (one) piece matching PVC Suction-pipe of 7.5 meter length. b) 1 (one) roll matching flexible PVC Delivery-pipe of 7.5 meter length. c) 1 (one) no. matching Foot-valve with necessary fixing clamp etc. iv) BIS certification. v) ISI marking.

42	**(b) Electrical Submersible Pump-set for STW**	i) Type: Electrical Submersible Pump-set for Shallow Tube Well (STW) having 150 mm diameter bore-well ii) Electric motor (Single-phase) (HP): 1.5-2.0 iii) BIS certification. iv) ISI marking v) Accessories: Rope etc. for fitting the pump-set inside bore well up to a depth of 40m including electric cable and starter.
43	**Sprinkler Irrigation Set**	(a) Type: Sprinkler Set for Portable sprinkler irrigation system with coverage area of 1 ha and each set comprises following quantity of items as specified: i) 30 Nos. of HDPE Pipes with QRC (Pipe of Class II; 3.2 kg/cm^2 IS:14151 Part-I) 63mm dia& 6m long ii) 5 Nos. QRC HDPE 63mm Service Saddle (IS:14151 Part-II) iii) 5 Nos. GI Riser Pipe 3/4" dia & 75 cm long iv) 5 Nos. Metal Sprinkler Nozzles (1.7 to 2.8 kg /cm^2 IS:12232 Part-I) v) 1 No. QRC HDPE Bend with Coupler 900 (63/50mm) (IS:14151 Part-II) vi) 1 No. QRC HDPE Pump Connecting Nipple 63 mm (IS:14151 Part-II) vii) 2 Nos. QRC HDPE End Plug (63mm) (IS:14151 Part-II) viii) 1 No. QRC HDPE Tee with Coupler (63mm) (IS:14151 Part-II) (b) BIS certification. (c) ISI marking
44	**Mobile Raingun Sprinkler**	(a) Type: Mobile Raingun sprinkler system with coverage area of 1 ha and each set comprises following quantity of items as specified: i) HDPE Pipes with Quick Release Coupler (Pipe of Class III; 4 kg/cm^2) IS:14151 Part I, 75mm diameter & 6m long: 30 Nos. ii) Metal Raingun with 30 m radius of throw (IS:12232 Part-II): 1 No. iii) Tripod Stand: 1 No. iv) QRC HDPE Bend with Coupler 90 Degree (75mm) IS:14151 Part II: 1 No. v) QRC HDPE Pump Connecting Nipple 75mm IS:14151 Part II: 1 No. vi) QRC HDPE End Plug (75mm) IS:14151 Part II: 1 No. vii) QRC HDPE Tee with Coupler (75mm) IS:14151 Part II: 1 No viii) Screen filter 20 / 25 m^3/hr: 1 No. ix) By Pass Assembly 2": 1 No. (b) BIS certification. (c) ISI marking.
45	**Drip Irrigation Set for wide spaced crop at 9m x 9m (Lateral x Dripper) spacing**	(a) Type: Drip Irrigation System with all Fittings & Accessories for Wide Spaced Crops for coverage area of 1 hectare at 9m x 9m (Lateral x Dripper) spacing and each set comprises following quantity of items as specified: i) 156 m PVC Pipe 50 mm; Class II; 4kg / cm^2; IS : 4985 (2000) ii) 1111 m Lateral 12 mm Class II ;2.5 kg / cm^2 iii) 494 No. Emitter 4 / 8 lph iv) 370 Microtube 6 mm v) 1 No. Control Valve 50 mm, vi) 1 No. Flush Valve 50 mm vii) 1 No. Air Release Valve 1" viii) 1 No. Non Return Valve 1.5" ix) 1 No. Throttle Valve 1.5" x) 1 No. Screen Filter 10 m^3 / hr xi) 1 No. By-pass Assembly -1.5" xii) 1 No. Venturi& Manifold 1.5" (b) BIS certification. (c) ISI marking

46	**Drip Irrigation Set for wide spaced crop at 3m x 3m (Lateral x Dripper) spacing**	(a) Type: Drip Irrigation System with all Fittings & Accessories for Wide Spaced Crops for coverage area of 1 hectare at 3m x 3m (Lateral x Dripper) spacing and each set comprises following quantity of items as specified: i) 54 m PVC Pipe 75 mm; Class II ; 4kg / cm^2; IS : 4985 (2000) ii) 102 m PVC Pipe 63 mm; Class II ; 4kg / cm^2; IS : 4985 (2000) iii) 3333 m Lateral 12 mm Class II ;2.5 kg / cm^2 iv) 2267 No Emitter 4 / 8 lph v) 1 No. Control Valve 75 mm vi) 1 No. Flush Valve 63 mm vii) 1 No. Air Release Valve 1" viii) 1 No. Non Return Valve 1.5" ix)1 No. Throttle Valve 1.5" x) 1 No. Screen Filter 10 m^3 / hr xi) 1 No. By-pass Assembly -1.5" xii) 1 No. Venturi& Manifold 1.5" (b) BIS certification. (c) ISI marking
47	**Drip Irrigation Set for close spaced crop at 2.5m x 0.6m (Lateral x Dripper) spacing**	(a) Type: Drip irrigation system with all Fittings & Accessories for close Spaced Crops for coverage area of 1 hectare at 2.5m x 0.6m (Lateral x Dripper) spacing and each set comprises following quantity of items as specified: i) 54 m PVC Pipe 75 mm; Class II; 4 kg / cm^2; IS : 4985 (2000) ii) 102m PVC Pipe 63 mm; Class II; 4 kg / cm^2; IS : 4985 (2000) iii) 60 m Lateral 16 mm Class II ; 2.5 kg / cm^2 iv) 4040 m Emitting Pipe 16 mm Class II (0.6 m x 1 to 4 lph) v) 1 No. Control Valve 63 mm vi) 1 No. Control Valve 50 mm vii) 1 No. Flush Valve 50 mm viii) 1 No. Air Release Valve 1" ix) 1 No. Non Return Valve 1.5" x) 1 No. Throttle Valve 1.5" xi) 1 No. Screen Filter 10 m^3 / hr xii) 1 No. By-pass Assembly – 1.5" xiii) 1 No. Venturi& Manifold 1.5" (b) BIS certification. (c) ISI marking
48	**Drip Irrigation Set for close spaced crop at 1.2m x 0.6m (Lateral x Dripper) spacing**	(a) Type: Drip irrigation system with all Fittings & Accessories for close Spaced Crops for coverage area of 1 hectare at 1.2m x 0.6m (Lateral x Dripper) spacing and each set comprises following quantity of items as specified: i) 54 m PVC Pipe 75 mm; Class II; 4 kg / cm^2; IS : 4985 (2000) ii) 102m PVC Pipe 63 mm; Class II; 4 kg / cm^2; IS : 4985 (2000) iii) 125 m Lateral 16 mm Class II ;2.5 kg / cm^2 iv) 8417 m Emitting Pipe 16 mm Class II (0.6 m x 1 to 4 lph) v) 1 No. Control Valve 63 mm vi) 2 No. Control Valve 50 mm vii) 1 No. Flush Valve 50 mm viii) 1 No. Air Release Valve 1" ix) 1 No. Non Return Valve 1.5" x) 1 No. Throttle Valve 1.5" xi) 1 No. Screen Filter 10 m^3 / hr xii) 1 No. By-pass Assembly – 1.5" xiii) 1 No. Venturi& Manifold 1.5" (b) BIS certification. (c) ISI marking.

49	**HDPE Pipe for Water conveyance (75 mm dia)**	i) Type: HDPE Pipe with QRC (Class IV; IS:14151 Part-I) for conveyance of irrigation water ii) Outside diameter: 75 mm iii) Length: 6 m iv) Working pressure: 6 kg / cm^2 v) BIS certification. (vi) ISI marking.
50	**PVC Pipe for Water conveyance (75 mm dia)**	i) Type: PVC Pipe (Class III; IS 4985: 2000) for conveyance of irrigation water ii) Outside diameter: 75 mm iii) Length: 6 m iv) Working pressure: 6 kg / cm^2 v) BIS certification. (vi) ISI marking.
51	**PolyethyleneDripper pipe**	i) Type: Polyethylene Dripper pipe of Class II; (IS 12786 : 1989) to be used for irrigation Lateral for dripper/ emitter. ii) Outside diameter: 25 mm iii) Working pressure: 4 kg / cm^2 iv) BIS certification. (v) ISI marking.
52	**Polyethylene films for mulching**	i) Type: UV stabilized Polyethylene films for mulching as per Code of Practice; IS 15177 : 2002 ii) Thickness: 100 micron iii) Colour: Black or White iv) Breadth: 120 cm v) BIS certification. vi) ISI marking.
53	**Polyethylene (HDPE) woven fabric(geo-membrane) for water proof lining**	i) Type: High density polyethylene (HDPE) woven fabric (geo-membrane) laminated with low density polyethylene (LDPE) or suitable combination of LDPE and LLDPE for use as lining forpond and reservoir to control seepage; IS:15351-2008 ii) Thickness: 500 micron (0.5 mm) iii) Weight (g/m^2): 420 iv) BIS certification. v) ISI marking.
54	**Supply, installation, commissioning and testing of Solar PV Pumping system**	Type: Supply, installation, commissioning and testing of Solar PV Pumping system on turnkey basis for irrigation purpose from bore-well of 80 mm / 100 mm diameter (bore-well along with pipes & fittings are to be constructed/ provided by the purchaser/beneficiary) at various sites, as per the technical specifications mentioned below. The whole Solar PV Pump set system shall be under warranty from the supplier for a period of 1 (one) year and comprehensive maintenance for 2 (two) years thereafter. **1. Solar PV Array:** Sufficient number of modules in series and parallel could be usedso that the pump-set could operate at a minimum of 85% of solar radiation to obtain the required PV array power output. The power output of individual PV modules used in the PV array, under Standard Operating Conditions (SOC) should be a minimum of 74 Watts peak, with adequate provision for measurement tolerances. Use of PV modules with higher power output is preferred. Indigenously produced PV module (s) containing mono/ multi crystalline silicon solar cells with following features should be used in the PV array for the SPV Water Pumping Systems: a) PV modules supplied with the SPV water pumping systems should have certificate as per IEC 61215/ IS 14286 specifications.

		b) PV modules must qualify to IEC 61730 Part 1- requirements for construction & Part 2 – requirements for testing, for safety qualification. c) The efficiency of the PV modules should be minimum 14% and fill factor should be more than 70%. d) PV module must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. e) The terminal box on the module should have a provision for "Opening" for replacing the cable, if required. f) Each PV module must use a RF identification tag (RFID), which must contain the following information: i) Name of the manufacturer ii) Model or Type Number iii) Serial Number iv) Month and year of the manufacture v) I-V curve for the module vi) Peak current of the module at 33 volts vii) Im, Vm and FF for the module viii) Unique Serial No and Model No of the module f) RFID shall be mandatorily placed inside the module laminate. A distinctive serial number starting with NSM will be engraved on the frame of the module or screen printed on the tedlar sheet of the module. **2. Motor Pump Set:** The motor pump sets to be supplied and installed in the SPV water pumping systems, shall have the following technical parameters: a) Mono block AC centrifugal/ Submersible motor pump-set driving unit and impeller mounted on a common shaft, thereby giving it a perfect alignment. b) The pump should be provided with specially developed mechanical seals which ensure zero leakage. c) The motor should be of 0.75 K.W. (1HP)/1.5 kw (2HP) and compatible to both solar PV and grid electricity. d) The suction/ delivery pipe (GI/HDPE), electric cables, floating assembly, necessary civil work and other fittings required to install the system. e) Following details should be marked indelibly on the motor pump-set : i) Name of the Manufacturer with Logo. ii) Model Number. iii) Serial Number. **3. Mounting Structures and Tracking System:** a) To enhance the performance of SPV water pumping systems, the fixed structure shall be so designed to avail maximum radiation. b) The PV modules will be mounted on metallic structures of sufficient strength, which can withstand load of modules and high wind velocities up to 150 km per hour. The support structure used in the pumping system shall be of hot dip galvanized iron (G.I). c) The "Mounting Structure" should have the following features: i) The modules support structure shall be mild steel, hot dipped galvanized (with minimum of 80 micron thickness) iron for holding the PV modules. The size of ground support angle iron and the main frame should not be less than 50x50x5 mm. ii) Each panel frame structure shall be so fabricated as to be securely grouted on ground on cement concrete block or on roof-top on its legs. It must withstand severe cyclone/ storm with the speed of 150 Km/Hr. iii) Each panel frame shall be complete with a weather proof junction box as per the relevant BIS specifications, where the module terminals shall be interconnected and output taken.

		iv) All nuts and bolts should be of BIS specification and should be corrosion-resistant. v) The structure should be designed to allow easy replacement of any Module. vi) The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels. vii) Earthing should be provided in the structure. **4. Electronics And Protections:** a) Maximum Power Point Tracker (MPPT) and Variable Frequency Drive (VFD) is to be provided for optimal use the Solar panel and maximizing the water discharge. b) Solar Controller (VFD) provided shall be designed for SPV systems to operate Solar Pump-set. c) VFD to be fitted in IP54 enclosure having DC switch and surge suppressor. d) The system shall have Protections like Pump-set Dry Run, Over Voltage, Under Voltage, Over Current, Short-Circuit, Over Speed/Under Speed, Surge Protection, Lightening Protection, hails & storms. e) The system shall have full protection against open circuit, accidental short circuit and reverse polarity. f) The solar inverter shall have sufficient capacity to operate the pump-sets under wide voltages. g) Solar Controller provided shall be designed for SPV systems as indicated in the Price Schedule to operate Solar Pump-set. **5. Interconnect Cables and "On-Off" switch:** a) BIS marked electrical switches suitable for AC use is to be provided with the motor pump set. b) Sufficient length of cable should be provided for inter-connection between the PV array and the motor pump set. (Bidder shall quote rates for cables assuming 50 meter lengths for calculating the total bid price).

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