



Republic of the Philippines
OFFICE OF THE SECRETARY
Elliptical Road, Diliman
1100 Quezon City

December 07, 2020

Memorandum Order
No. 17
Series of 2020

SUBJECT: GENERAL GUIDELINES ON THE IMPLEMENTATION OF SOLAR-POWERED FERTIGATION SYSTEM (SPFS) OF THE DEPARTMENT OF AGRICULTURE

As part of the continuing effort to modernize the agriculture sector, the Department of Agriculture (DA) aims to introduce advance technologies that will contribute to the increase in productivity while significantly cutting farmers' costs. The introduction of Solar Powered Fertigation System (SPFS) is one of the modern technologies that will redefine irrigation application as production efficiency is enhanced with the precise combination of fertilization and irrigation, while reducing irrigation cost.

This Guidelines is being issued to facilitate the implementation of SPFS in the Department and to provide greater clarity in its implementation, thus optimizing public investments in irrigation.

I. COVERAGE OF THE GUIDELINES

This Guidelines shall cover the implementation of Solar-Powered Fertigation System (SPFS) under the National Rice and Corn Program of the Department of Agriculture (DA).

II. GENERAL POLICY GUIDELINES

The SPFS is one of the Small-Scale Irrigation Projects (SSIPs) of the DA designed to increase cropping intensity, rice productivity, farm income, and employment. Its implementation shall be led by Bureau of Soils and Water Management (BSWM) and Bureau of Agricultural and Fisheries Engineering (BAFE). In particular, the BSWM and BAFE shall provide the over-all direction in the planning, implementation and operation of SPFS. The DA-Regional Field Offices (RFOs) shall undertake the implementation of SPFS within their respective regions.

All SPFS can be availed by qualified beneficiaries and proponents under the DA Rice and Corn Programs through grant but the recipient has to undertake responsibilities relative to permits, right-of-way, operation and maintenance. The National and Regional Research Centers of DA, Local Government Units (LGUs) and Research Centers of State Universities and Colleges (SUCs) with equivalent agricultural areas are considered qualified beneficiaries.

III. IMPLEMENTATION

Roles and Responsibilities of Implementing Agencies

- A. The BSWM shall:
1. Lead the annual updating of plans and targets for SPFS in coordination with BAFE and RFOs for integration to the National SSIP Master Plan;

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2. Review the Detailed Engineering Design (DED) and Program of Work (POW) of SPFS prepared by the RFOs per technical requirements;
3. Provide technical assistance in capacity building and conduct of specialized training courses for implementors; and
4. Consolidate the periodic reports of BAFE for inclusion in the SSIP report to be submitted to DA.

B. The BAFE shall:

1. Oversee the national planning, implementation and monitoring of SPFS in close coordination with BSWM;
2. Provide technical and administrative assistance to RFOs to facilitate planning, design, implementation, and operation of SPFS;
3. Coordinate with the DA National Programs for the allocation of funds;
4. Conduct Joint Technical Peer Review of engineering plans and designs to facilitate timely approval of projects;
5. Formulate system testing protocols in coordination with Agricultural Machinery Testing and Evaluation Center (AMTEC) and BSWM, and provide technical assistance on its conduct and evaluation;
6. Consolidate the periodic reports of RFOs for submission to BSWM; and
7. Conduct assessment jointly with BSWM and DA-Planning Service on the contribution of SPFS to agricultural development targets.

C. The RFO

Thru the Regional Agricultural Engineering Division (RAED), shall oversee the planning, programming, implementation, and monitoring of SPFS in their respective regions. In particular, it shall:

1. Validate suitable sites for SPFS and assess the readiness of eligible beneficiaries in accordance with the approved site selection criteria as indicated in the Site Validation Report (Annex A1 and A2);
2. Conduct pumping test/or and resistivity test on the proposed spfs-8 and SPFS-32 sites, if necessary;
3. Assist the eligible beneficiaries in securing permits such as drilling permit, water permit, among others;
4. Update and review the annual programming of SPIS/SPFS for inclusion in the Regional SSIP Masterplan;
5. Assist the Field Operations Division (FOD) in the conduct social preparation activity to qualified recipients;
6. Prepare project proposal including DED and POW per project incorporating the result of the soil analysis and resistivity test, and subsequently submit it to BSWM and BAFE;
7. Submit an annual target and budgetary requirement to BAFE and the regional banner programs for inclusion in the regional budget proposal;
8. Facilitate the resolution of Road Right of Way (RRROW) issues and acquisition of affected land if necessary;
9. Oversee the construction/installation of approved SPFS;
10. Spearhead the regular physical and financial monitoring during the implementation period as well as the operational monitoring after the turnover. The RAED shall also conduct geo-tagging activities before, during, and after the construction of the SPFS as part of monitoring;
11. Facilitate the provision of capability development activities to recipients, LGUs and other concerned agencies/organizations (e.g. SWISA), and coordinate with other offices such as BSWM, TESDA, and ATI for training support;
12. Submit periodic reports including the geotagged photos for consolidation, assessment and submission to DA;
13. Provide assistance to AMTEC in the conduct of testing and evaluation of the SPFS;

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2. Qualified beneficiaries
 - Farmers Organization
 - National and Regional Research Centers of DA
 - Local Government Units (LGUs)
 - State Universities and Colleges (SUCs)
3. With adequate potential water source (groundwater or open source)

Details of the site selection criteria for SPFS-8 and SPFS-32 is attached as Annex B.

Additional Guidelines for both SPFS-8 and SPFS-32

1. The qualified beneficiaries shall submit the letter of intent or letter request for SPFS together with the following documentary requirements:
 - a. Letter of Intent and Board Resolution signed by majority of the Board members, stating the (a) justification or explanation for the need for SPFS; (b) commitment to shoulder the cost of operation and maintenance of SPFS; and (c) authorized representative to sign the MOA/any legal documents relative to SPFS;
 - b. Endorsement from Municipal Agriculture Office (MAO)/ City Agricultural Office (CAO), and/or Provincial Agricultural Office (PAO), stating the consistency of the request to local development plans such as local Agriculture and Fisheries Modernization Plan (AFMP), Local Commodity Investment Plan, among others;
 - c. Map of the area showing the water source and the existing and potential production area; and
 - d. Profile of the organization and its members (Farmers Organization) or organizational structure (for LGUs and SUCs).
2. The DED and POW of the proposed systems must be prepared signed and sealed by Professional Agricultural and Biosystems Engineer with valid Professional Regulation Commission (PRC) License and Professional Tax Receipt (for non-government practitioner), in consonance with RA 10915.
3. It should be stipulated in the procurement documents that the contractor shall provide warranty and after-sales service conforming to PNS/BAFS/PABES 192:2016 (Guidelines on After-Sales Service). The contractor shall also be required to schedule at least two (2) follow-up visits to the beneficiary within the warranty period. The first visit shall check for the proper operation of the SPFS. The second visit shall be conducted prior to the end of the Defect Liability Period to check for the proper maintenance of the SPFS. Additionally, the contractors should have a feedback mechanism (call or messaging) for regular communication among contractor, beneficiary, and RFO regarding the use, performance and problems with the SPFS.
4. System testing and commissioning of SPFS shall be conducted by AMTEC and RAED together with the contractor and beneficiary. No acceptance report shall be signed by the DA-RFO unless the SPFS has already complied with the desired performance and set standards. An Acceptance/Compliance Report shall be issued by the RAED based on the system test result, which shall be one of the requisite documents in payment. The report shall likewise form part of the Deed of Donation.

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14. Assist the recipients in the avallment of the warranty and after sales service;
and
15. Oversee the collection, disposal, and overall waste management of solar panels and other SPFS materials.

Thru Field Operations Division (FOD), shall ensure that the proposed SPFS are funded and shall contribute to the objectives of the banner programs, It shall:

1. Conduct social preparation activity to qualified recipient jointly with RAED;
and
2. Complement the SPFS with provision of fertilizer, farm machinery, facilities and other appropriate technical and/or production support services as deemed necessary.

Thru the Integrated Laboratory Division (ILD), shall conduct soil analysis of the site and determine appropriate fertilizer requirement. The result of the analysis shall be forwarded to RAED for consideration in the design and FOD for possible fertilizer assistance.

Thru the Planning, Monitoring and Evaluation Division (PMED), shall determine and analyze the emerging benefits of the SPFS one year after the project completion. The report shall be submitted to RAED for inclusion in the periodic report to be submitted to BSWM and BAFE.

IV. SPECIFIC GUIDELINES FOR SOLAR-POWERED FERTIGATION SYSTEM

Solar-Powered Fertigation System – An irrigation system powered by solar energy with the integration of low-pressure fertigator tanks. The system provides both water and nutrient requirements in the pre-determined right time and quantity.

The SPFS will have two (2) systems, namely: 1) SPFS-8 and 2) SPFS-32. Each system has the following requirements as indicated below

SPFS-8 involves the upgrading of existing Shallow Tube Well (STW) and Pump Irrigation System for Open Source (PISOS)

1. Coverage area
 - With an existing service area of 5 ha and additional potential area of 3 ha
2. Qualified beneficiaries
 - Farmers Organization
 - National and Regional Research Centers of DA
 - Local Government Units (LGUs)
 - State Universities and Colleges (SUCs)
3. With existing functional well (for STW)

Note: SPFS-8 may also include construction of new STW provided that the beneficiary will assume the cost of drilling and the well must be functional prior to the onset of implementation.

SPFS-32 involves the construction of new SPFS

1. Coverage area
 - With a service area of 32 ha

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5. All proposed, on-going and completed SPFS shall be registered to Agricultural and Biosystems Engineering Management Information System (ABEMIS). The status of implementation/operation/utilization shall be updated by the RAED in the ABEMIS for planning and monitoring purposes.
6. To facilitate smooth implementation of the project, the selected sites should be free from conflicts involving the right of way and peace and order. In case of change/transfer of approved project sites due to issues such as right-of-way, peace and order, force majeure and technical concerns, the new site should have the same service area and beneficiary. The transfer of site should be approved by the Regional Executive Director and forwarded to BAFE.

In case the transfer of site will involve relocation to a different site, the newly approved site must be within the same city/municipality/district/province. A waiver/resolution from the beneficiaries should be attached to the RFO's approval.
7. Downloading of funds for the implementation of SPFS shall not be allowed.

V. RESPONSIBILITIES OF FARMER-BENEFICIARIES/PROJECT RECIPIENTS

The DA-RFO shall execute a Memorandum of Agreement (MOA) with the beneficiary specifying the detailed arrangements during the construction of the SPFS and operational phase of the project. The MOA shall require the following minimum undertakings from the beneficiary:

- a. secure permits such as drilling permit, water permit, among others;
- b. assist in the resolution of right-of-way concerns;
- c. assume the operation and maintenance of the system upon turn-over, including the cost of minor repairs and cost of parts after the warranty period, except for repairs that were caused by force majeure;
- d. ensure that the SPFS will be used by the intended beneficiaries;
- e. attend relevant trainings (e.g. trouble-shooting, and maintenance of SPFS, etc.) being provided by DA and other agencies such as TESDA; and
- f. regularly report the operational status of the SPFS and service area generated per cropping; and
- g. must be willing to adapt the fertigation and staggered planting

VI. REVIEW OF PROJECT PROPOSAL

No proposal shall be recommended for funding to DA Programs unless reviewed by BSWM and BAFE. The submitted proposals shall be reviewed based on the following criteria:

- Included in the annual updated lists of proposed projects in the National SSIP Master Plan
- With complete DED and POW
- Compliance with the PAES
- Supported with Feasibility Study with positive economic indicators

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VII. SUPPLEMENTAL GUIDELINES

1. All DA-RFOs and MAFAR are hereby authorized to formulate detailed supplemental guidelines to address peculiar situations of a particular region or to clarify further those indicated in the Memorandum Order. A copy of all regional issuance for supplemental guidelines shall be officially furnished to the BSWM, BAFE and Banner Programs Secretariat within seven (7) working days from the date of its release.
2. The DA Secretary may authorize the DA-RFOs to adopt and implement other modalities or schemes in the implementation of SPFS.


VIII. RESOLUTION OF ISSUES UNDER THIS IMPLEMENTING GUIDELINES

All issues and concerns pertaining to these implementing guidelines shall be forwarded to the Office of the BSWM and BAFE Directors for appropriate and immediate action.

IX. EFFECTIVITY

This General Guidelines shall take effect immediately upon approval

Approved and promulgated this 14th of December 2020


WILLIAM D. DAR, Ph.D
Secretary
Department of Agriculture
ae

DEPARTMENT OF AGRICULTURE
In replying pls cite this code :
For Signature: S-12-20-0350
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ANNEX A1

SOLAR POWERED FERTIGATION SYSTEM

SITE VALIDATION FORM (GROUND WATER)

BACKGROUND INFORMATION:	
A1. Who and why requested. Annex A copy of the letter request	
A2. Composition of validation team. (1e Staff from RFO (name/designation-----), Staff from BSWM (name/designation----), staff from BAFE, Farmer leader, etc. Please include contact numbers)	
B. PROJECT PROFILE:	<input type="checkbox"/> SPFS-8 <input type="checkbox"/> SPFS-32
Name of Project:	
Location: (Barangay, Municipality, Province, Region)	
Transportation/Accessibility of the site/Proximity to existing all weather roads	
C. CLIMATE & SOLAR IRRADIATION DATA:	
Type of climate: (Rainfall pattern)	<input type="checkbox"/> Type 1 <input type="checkbox"/> Type 2 <input type="checkbox"/> Type 3 <input type="checkbox"/> Type 4
Daily Irradiance (Kwh/m ² /day) secondary data	
D. WATER SOURCE DATA:	
D.1. For SPFS 8	
Well location (in 6 decimal degrees) Privately owned/public land	Coordinates N _____ and E _____ <input type="checkbox"/> Yes <input type="checkbox"/> No
Well condition	<input type="checkbox"/> Functioning <input type="checkbox"/> Not function
Well age (yrs.) /rehab already or not yet rehab	_____ Years <input type="checkbox"/> Yes <input type="checkbox"/> No
Well depth, by rope or sounder, (mbgs)	
Well size, (mm)	
Well casing size (mm)	
Static water level (mbgs)	
No of wells within 100 m. from	
Discharge rate (m ³ /hr)	
Water quality (no possibility of saline intrusion)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Distance of well from nearest point of delivery (m)	
Area served by the well (ha)	
Number of farmers served by the well	
Others	
D.2. For SPFS-32	
Location of proposed well (Coordinates, in decimal degrees, 6 digits)	
Indicators for possible availability of ground water (soil type, parent materials/presence and type of rock out crops)	
Proximity of the proposed well site to the nearest open water sources, m.	
Proximity to adjacent wells and number of wells within 200 meters, (m)	Distance= _____ (m) Static water level= _____ (mbgs)
Distance of proposed well to the service area (m)	
Others	

E. PUMP AND ENGINE DATA:	
<i>For SPFS-8</i>	
Pump Type/Engine Type	
Pump & Engine Model/Brand	Pump=_____ Engine =_____
Pump and Engine age (years)	Pump=_____ Engine =_____ yrs
Pump capacity, (lps), pump type: Engine Capacity, hp	Pump=_____ lps Engine =_____ hp Pump type:_____ Engine type:_____
Pump TDH (m)	TDH=_____ m.
Pump/Engine physical condition (by testing)	<input type="checkbox"/> Functioning <input type="checkbox"/> Not function
Pump & Engine source (Funding Source and year of funding) From DA	<input type="checkbox"/> Yes <input type="checkbox"/> No what program_____ year:_____
Others	
F. AGRICULTURAL/LAND RESOURCES DATA:	
Potential Irrigable Production/Rainfed Area (ha)(within the identified suitable areas for SPIS 8)	
Soil texture/type of service area:	
Crops planted (if any)	
Cropping pattern	
Cropping Calendar	
Average yield (Mt/ha/season): (of the Validated Production Area)	
Existing Irrigated Area (ha):	
Type of Existing Irrigation system (if any):	<input type="checkbox"/> STW/PISOS <input type="checkbox"/> SWIP/DD <input type="checkbox"/> Others Specify _____
G. INSTITUTIONAL DATA:	
Requesting party/Indorsing party	
Name of organization (if there's any):	
Potential Number of Beneficiaries	
Tenural Status (owner/tenant)	<input type="checkbox"/> Owner _____ <input type="checkbox"/> Tenants _____
Availability of potential site for solar panels, and other appurtenant structures (Area is 30 m ² minimum for SPFS-8 and 140 m ² for SPFS-32., shade free, not on flood prone area, etc.)	<input type="checkbox"/> yes <input type="checkbox"/> none <input type="checkbox"/> others
Social Acceptance and reception (willingness to assist in the validation activity, reactions through interviews, etc.)	<input type="checkbox"/> willing <input type="checkbox"/> not willing
Willingness to adopt fertigation technology	<input type="checkbox"/> willing <input type="checkbox"/> not willing
I. OBSERVATIONS AND FINDINGS (to include potential issues and problems, presence and distance of electric grid from the project site.etc.), Potential obstruction/shading.	

J. RECOMMENDATIONS (to include future activities, resolutions of issues and potential constraints, decisions whether feasible or not and why, etc):

K. PHOTO DOCUMENTATIONS (to include **date** and **name of photographer**): Geo-tagged pictures, satellite images from google earth, others ; should be colored and with captions/label as to location of well, pump and engine if possible, service area, etc. (min 2 photos and 5 max)

PHOTO DOCUMENTATION

NAME OF PROJECT LOCATION

Date Taken:

Photographer: NAME

FIG. 1 WATER SOURCE/PUMP & ENGINE	FIG. 2 POTENTIAL SITE FOR SOLAR ARRAY
FIG. 3 TARGET SERVICE AREA	FIG. 4 VALIDATION TEAM (during the validation activities)

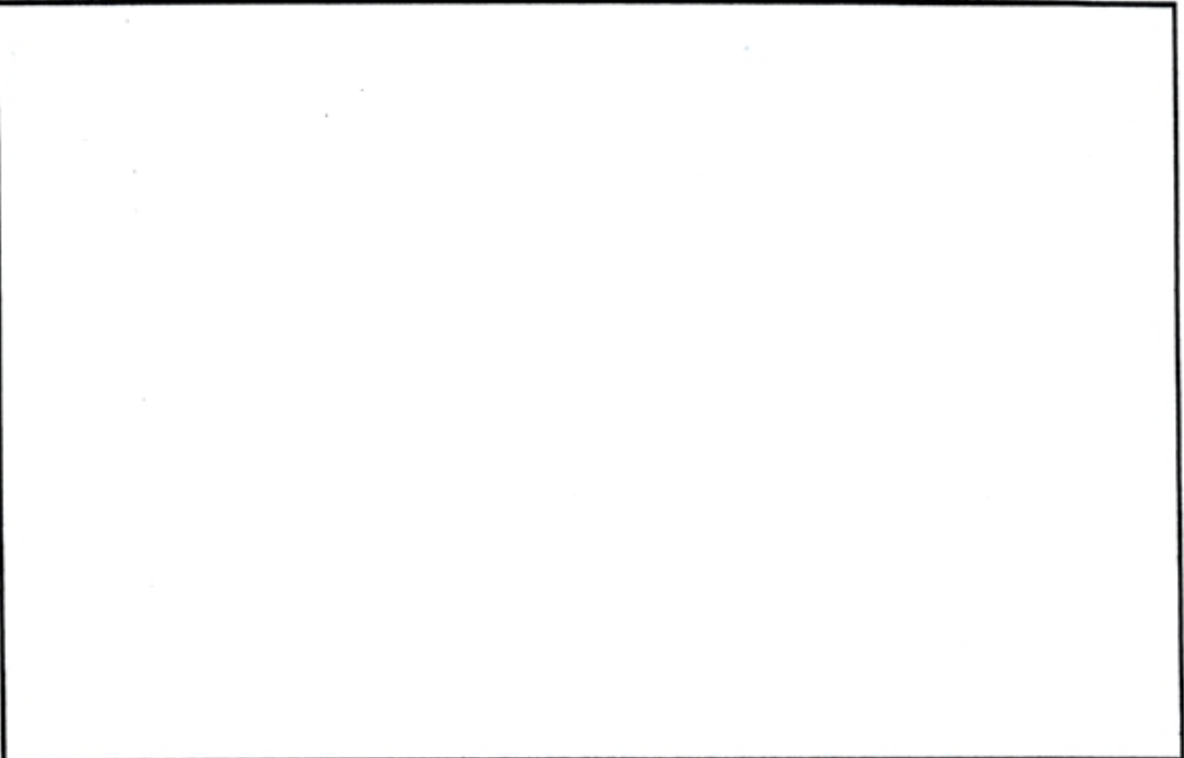


FIG. 5 GOOGLE IMAGE SHOWING THE LOCATION OF WATER SOURCE, POSSIBLE LOCATION OF SOLAR ARRAY & DELINEATED SERVICE AREA

Tools, gadgets and materials to be used during the validation (GPS Device, Altimeter, Range Finder, and Flow Meter, tape, rope or sounder, field notes, validation form

Date validated: _____

Validated by: NAME OF AGRICULTURAL ENGINEER

Noted by: RAED CHIEF

Recommending Approval: RTD for Operations

Approved by: RED

ANNEX A2

SOLAR POWERED FERTIGATION SYSTEM

SITE VALIDATION FORM (OPEN SOURCE)

A. BACKGROUND INFORMATION:	
A1. who and why requested. Annex A copy of the letter request	
A2. Composition of validation team. (ie Staff from RFO (name/designation-----), Staff from BSWM (name/designation----), staff from BAFE, Farmer leader, etc. Please include contact numbers)	
B. Project Profile:	<input type="checkbox"/> SPFS-8 <input type="checkbox"/> SPFS-32
Name of Project:	
Location: (Barangay,Municipality,Province, Region)	
Transportation/Accessibility of the site/Proximity to existing all weather roads	
C. CLIMATE & SOLAR IRRADIATION DATA:	
Type of climate: (Rainfall pattern)	<input type="checkbox"/> Type 1 <input type="checkbox"/> Type 2 <input type="checkbox"/> Type 3 <input type="checkbox"/> Type 4
Daily Irradiance (Kwh/m ² /day) secondary data	
D. WATER SOURCE DATA:	
Name of River/Creek	
Coordinates/Location of possible sump (in 6 decimal degrees)	Coordinates N _____ and E _____
Watershed area (ha)	
Water level (Min. & Maximum), mbgs	
Stable river bank height (m)	
River/creek discharge (lps) (discharge measurement method used)	
Average River width (average of 3 measurements if irregular shape)	
Flood marks height from river bed or if banks are overtopped (by observation & interviews)	
Water permites (volume granted in lps) downstream of proposed site (if available), other water users	
Other information (water quality (color), saline intrusion, presence of silt deposition in river bed) by observations	
E. PUMP AND ENGINE DATA: For SPFS-8	
Pump Type/Engine Type	
Pump & Engine Model/Brand	Pump= _____ Engine = _____
Pump and Engine age (years)	Pump= _____ Engine = _____ yrs
Pump capacity, (lps), pump type: Engine Capacity, hp	Pump= _____ lps Engine = _____ hp
	Pump type: _____ Engine type: _____
Pump TDH (m)	TDH= _____ m.
Pump/Engine physical condition (by testing)	<input type="checkbox"/> Functioning <input type="checkbox"/> Not function
Pump & Engine source (Funding Source and year of funding) From DA	<input type="checkbox"/> Yes <input type="checkbox"/> No if yes: what program _____ year: _____
Others	

F. AGRICULTURAL/LAND RESOURCES DATA:	
Potential Irrigable Production/Rainfed Area (ha)(within the identified suitable areas for SPIS 8)	
Soil texture/type of service area:	
Crops planted	
Cropping pattern	
Cropping Calendar	
Average yield (Mt/ha/season): (of the Validated Production Area)	
Existing Irrigated Area (ha):	
Type of Existing Irrigation system (if any):	<input type="checkbox"/> STW/PISOS <input type="checkbox"/> SWIP/DD <input type="checkbox"/> Others Specify _____
G. INSTITUTIONAL DATA:	
Requesting party/Indorsing party	
Name of organization (if there's any):	
Potential Number of Beneficiaries	
Tenural Status (owner/tenant)	<input type="checkbox"/> Owner <input type="checkbox"/> Tenants
Availability of potential site for solar panels, and other appurtenant structures (Area is 30 m ² minimum for SPFS-8 and 140 m ² for SPFS-32., shade free, not on flood prone area, etc.)	<input type="checkbox"/> yes <input type="checkbox"/> none <input type="checkbox"/> others
Social Acceptance and reception (willingness to assist in the validation activity, reactions through interviews, etc.)	<input type="checkbox"/> willing <input type="checkbox"/> not willing
Willingness to adopt fertigation technology	<input type="checkbox"/> willing <input type="checkbox"/> not willing
I. OBSERVATIONS AND FINDINGS (to include potential issues and problems, presence and distance of electric grid from the project site.etc.), Potential obstruction/shading.	

J. RECOMMENDATIONS (to include future activities, resolutions of issues and potential constraints, decisions whether feasible or not and why, etc):

K. PHOTO DOCUMENTATIONS (to include **date** and **name of photographer**): Geo-tagged pictures, satellite images from google earth, others ; should be colored and with captions/label as to location of well, pump and engine if possible, service area, etc. (min 2 photos and 5 max)

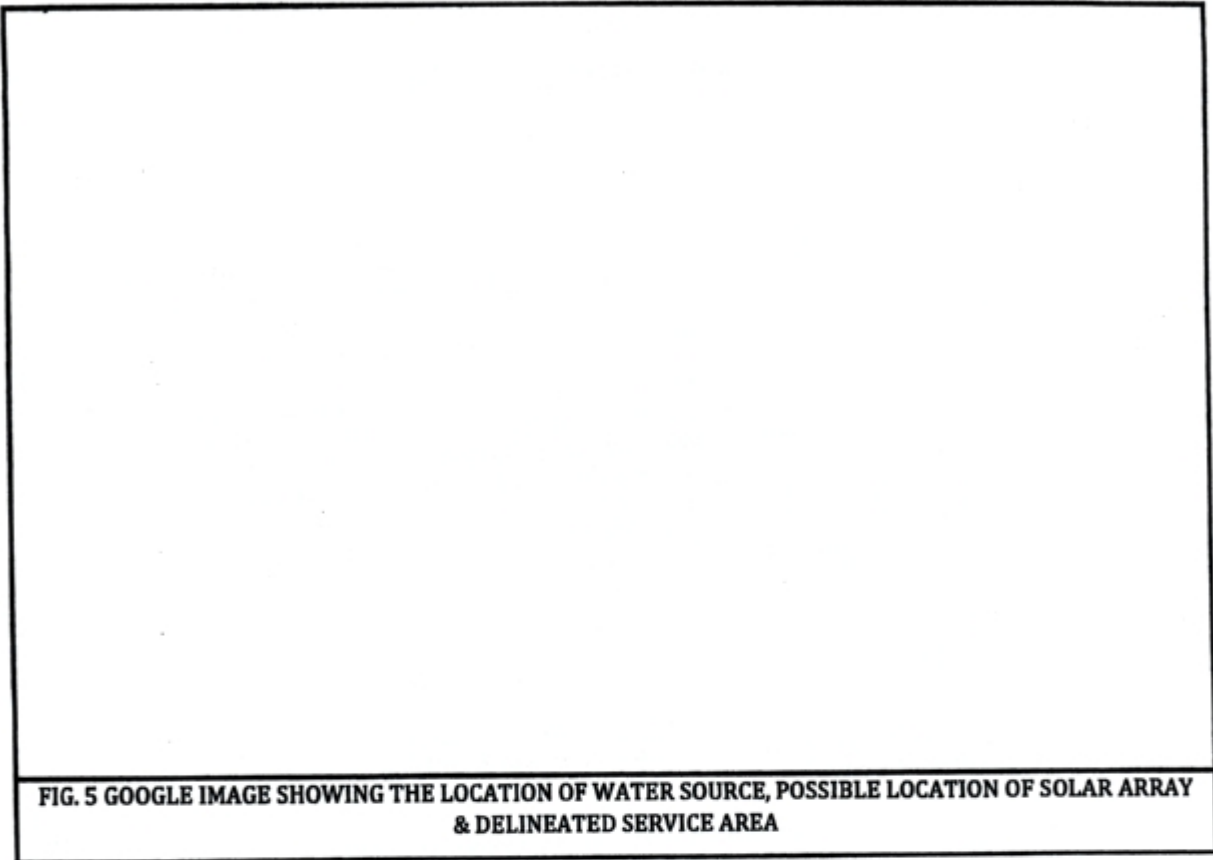
PHOTO DOCUMENTATION

NAME OF PROJECT, LOCATION

Date Taken:

Photographer: NAME

FIG. 1 WATER SOURCE/PUMP & ENGINE	FIG. 2 POTENTIAL SITE FOR SOLAR ARRAY
FIG. 3 TARGET SERVICE AREA	FIG. 4 VALIDATION TEAM (during the validation activities)



Tools, gadgets and materials to be used during the validation (GPS Device, Altimeter, Range Finder, and Flow Meter, tape, rope or sounder, field notes, validation form

Date validated: _____

Validated by: NAME OF AGRICULTURAL ENGINEER

Noted by: RAED CHIEF

Recommending Approval: RTD for Operations

Approved by: RED

ANNEX B

SOLAR POWERED FERTIGATION SYSTEM

SITE SELECTION CRITERIA

A viable site should pass the following criteria:

1. **Regulatory:**
 - a. Agreement with the Irrigation Association and / or the individual landowner for the installation of the SPFS and the use of the irrigation system by the association and its members.
 - b. A GIS tagged DWG file with plot survey and division, including details of each plot owner
 - c. Consent of the land owner where the system is installed to irrigate area controlled by other farmers and to remove any shading objects in the vicinity of the SPFS solar array. Legal documents (i.e. Deed of Donation/Right of Way) should be provided by the LGU/ Farmers' Association as shown in the Memorandum of Agreement.
 - d. Right of way to and from the site during installation and maintenance of the system.
 - e. Right of way through any plot used for the excavation and installation of underground water pipes and solar array.
 - f. Consent of all the farmers to use the SPFS

2. **Technical:**
 - a. The site shall have adequate recharge of the aquifer system such that there is enough quantity of infiltrating water.
 - b. It is highly prioritized that SPFS-8 will be constructed in existing Shallow Tube Wells (STW). The recommended maximum static water table is 5 meters and maximum dynamic water depth is 7 meters. There should be a minimum flow of 50 m³/h for 4" well.
 - c. For SPFS-32, the recommended maximum static water table is 15 maximum and maximum dynamic water depth of 20 meters. There should be a minimum flow of 150 m³/h for an 8" well. Total Dynamic Head (TDH) should not be more than 30 meters, including friction losses of up to 10 meters.
 - d. The site shall be at an area with low vulnerability to pollution and seawater intrusion potential.
 - e. The site's slope, distance from existing boreholes or wells and from physical discharges of aquifers shall be determined and considered. Groundwater source should be within 200 meters from the Irrigable area.
 - f. A cellular network coverage is necessary, as it is required for remote monitoring and precision agriculture (for system control and data acquisition installation).