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اعلان صادر عن المركز الوطني للبحوث الزراعية
يرغب المركز بطرح العطاءات التالية :-

رقم العطاء	موضوع العطاء	ثمن نسخة دعوة العطاء	آخر موعد لبضع نسخة دعوة العطاء الساعة: 12.30 ظهراً	آخر موعد لإيداع العروض الساعة: 12.30 ظهراً
2026/7	توريد وتركيب وتشغيل نظام ذكي لخلط مياه الري وإدارة جودتها	(50) دينار	2026/6/23 الثلاثاء	2026/7/1 الاربعاء
2026/8	توريد وتركيب وتشغيل محطة ذكية تعمل بالطاقة الشمسية لمراقبة رطوبة ودرجة حرارة التربة	(25) دينار		

على من يرغب المشاركة بالعطاء مراجعة مقرر لجنة الشراء الرئيسية في المركز الوطني للبحوث الزراعية / البقعة (هاتف/301/4725071) لشراء نسخة دعوة العطاء مصطحبين معهم رخص المهن سارية المفعول والسجل التجاري .

ملاحظات:-

* أجور الإعلان على من يرسو عليه العطاء مهما تكرر.

** للجنة المشتريات الحق بالغاء العطاء في أي مرحلة من مراحلها دون ابداء الاسباب ولا يترتب على هذا الالغاء اية مطالبات مالية وقانونية.

* الدخول على موقعنا الالكتروني www.narc.gov.jo للاطلاع على وثيقة العطاء.

المدير العام

الاستاذ الدكتور ابراهيم محمد الرواشدة



المركز الوطني للبحوث الزراعية
National Agricultural Research Center

التاريخ : ٢١/٥/٢٠١٧

نموذج استدرج اسعار
الرقم المتسلسل لطلب الشراء: ٤٤٤

مديرية اللوازم والعطاءات

الرقم	قائمة اللوازم	المطلوب		المواصفات	السعر الافرادي	السعر الاجمالي
		الوحدة	الكمية			
1.	Supply, installation, testing, commissioning, operation, and training for a smart irrigation water mixing system based on a Decision Support System (DSS) capable of automatically blending two irrigation water sources with different salinity levels (TDS/EC) to achieve a desired irrigation water quality suitable for different crop requirements.	عدد	10	According to the technical specifications		
2						
3						
4						
5						

المجموع :- النهائي رقما () كتابة ()

اسم و توقيع المورد:

ختم المورد:

التاريخ:



موضوع العطاء: توريد وتركيب وتشغيل وتدريب نظام لخلط المياه باستخدام تقنية نظام دعم القرار بناء على مقياس ملوحة المياه المرغوبة للري

Decision Support System (DSS) based
on desired TDS Index for Irrigation
Water

رقم العطاء:

المواصفات الفنية

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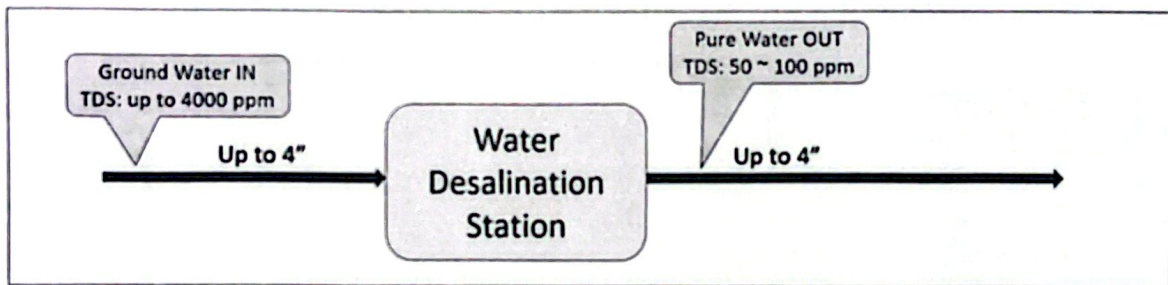
1. System Description

Advance Decision Support System (DSS) is a Mixing Junction Control and Monitoring System.

The DSS algorithm will be based on mixing the two water sources each source at different TDS index, in a ratio to output an irrigation water at desired TDS determined by the farmer which is dependent on the crop types to be irrigated.

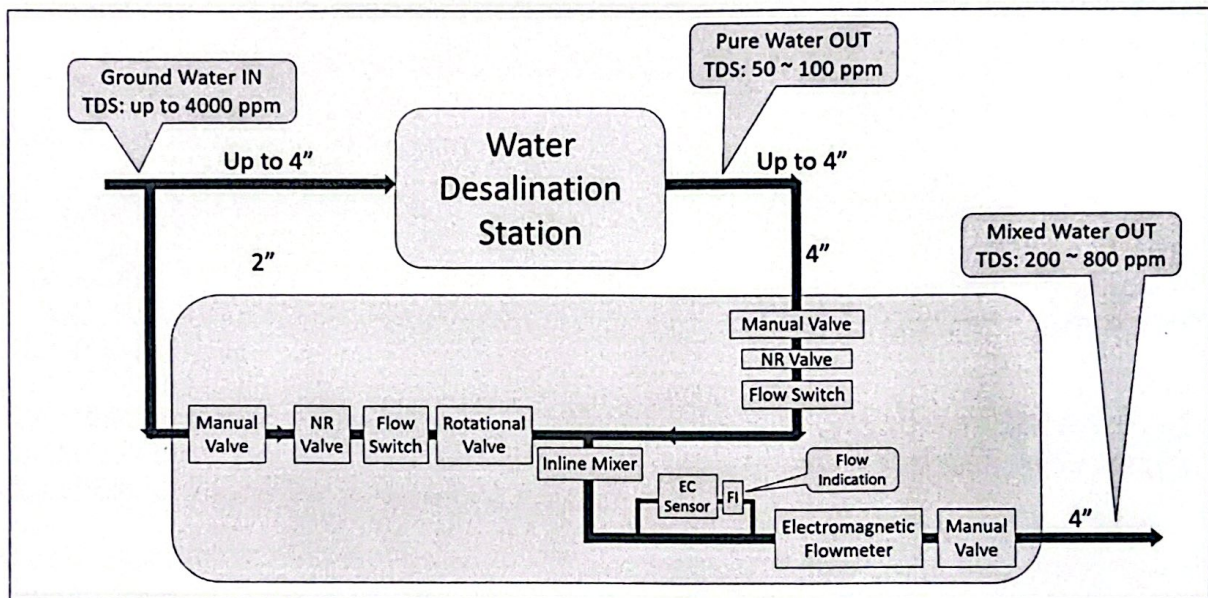
The required system enables the mixing of different water quality sources for irrigation purposes and is based on a reliable hardware infrastructure (cloud server, storage, sensors, PLC, and I/O processor).

The DSS system target is to mix purified water from desalination stations existing at farms (usually generating water TDS: 50~100 ppm) with ground water existing at same farm (TDS up to 4000 ppm) to yield mixed water used for irrigation at a desired settable TDS usually (from 200~800) according to crop type.



Existing Water Desalination Station at Farm

The bidder is required to design a proper inline mixing system to mix the purified water of the desalination station (as it is being generated) along with ground water. The mixing ratio is determined by the target TDS value.



With Direct DSS Inline Mixing

The bidder design needs to include the following in his design:

- Inline mixer
- TDS sensor
- Electromagnetic Flowmeter 4"
- Non-return valves
- flow switches
- Manual/Electrical Valves, Electrical Rotational Valves, auxiliary pumps if required, and any fittings.

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A Touch display is required at the control panel.

Cloud-based system with logging of historical data for one year minimum, logged data to the cloud with adjustable interval starting from 2min as a minimum.

Remote Monitoring and Control from anywhere outside the farm.

The required systems are 10 identical systems, to be installed in different farms.

NARC staff can monitor and control all systems, whereas each farm owner can monitor and control his own system.

The farmer can monitor and control his farm from any PC/ mobile.

Water rate used for irrigation can vary up to 30~60 m³/hour, so the designed system should be able to cope with maintaining the desired TDD with this variation in flow.

The system shall be able to measure the TDS water quality index for each water source before starting at any time when farmers want to. These indices are then stored in the system along with the desired TDS index needed for irrigation.

4G router to be included in each system along with SIM card valid for 3 years.

The bidder is required to include in his offer a list and a drawing highlighting all fittings/accessories needed to integrate his system with the existing Water Desalination Station at the farm.

The bidder is required to mention in his offer the list of fittings required from farmer side (supported by a drawing) to connect to farmer existing desalination system, while keeping these fittings required by the farmer to minimum.

In case of DSS mixing system failure, the farmer must still be able to use the existing legacy desalination plant.

The DSS system must still be functional using the on-site touch screen in case of no internet connection with cloud server. However, all data (during period of no internet connectivity) must be logged and then uploaded to cloud server when internet connection is resumed.

The pipe size of the existing Water Desalination Station IN/OUT can be assumed in the range up to 4" for the targeted farms.

To simplify the operation, designed system to have a Dry Contact (Relay) to operate the existing Desalination System automatically when required to irrigate by the farmer.

The designed system must have the ability to run and start generating output mixed water based on either:

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- Run Period required
- Output Mixed Water Volume (cubic meters) required

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2. System Requirements

In addition to what has been mentioned in **System Description**, for every DSS system, the following requirements must have:

- 1 The system to be installed over a galvanized steel SKID of appropriate size and height. PVC Pipes, flowmeters, water pumps, sensors, valves, flow switches, and any other system components/fittings are to be mounted on this SKID.
- 2 Electrical Cabinet that contains all the control components of the system to be mounted over the SKID at suitable height to be used conveniently by the farmer
- 3 IoT logger and any other control/automation components to connect whole components of the system.
- 4 Touch Display of size of 10.1" that enables on-site monitoring & control with well-designed user-interface for the farmer. Both Arabic & English is a must
- 5 4G Cellular Router
- 6 4G SIM card valid for 3 years
- 7 Remote software for automatic data-log reports, graphic reports, summary reports and alarm reports, multi-users accessing the system, with following requirements:
 - a. NARC Users can view all systems together from mobile and/or PC.
 - b. Each farm owner can view his own system from mobile and/or PC.
 - c. Cloud storage for all logged data and alarms for last 12 months
- 8 Secure Cloud System and loggings (TSL)
 - a. Secure connection between IoT Logger and Cloud
 - b. Secure connection between Cloud and User
- 9 Sensor (EC Electrical Conductivity) for DSS algorithm
- 10 Electrical conduits/glands to be used to connect all electrical wires to the Electrical Cabinet
- 11 EC Sensor to be installed on sub-pipe at low flow and not direct on main water pipe with flow indication of water flowing/stopped in the sub-pipe.
- 12 In case of using pumps, appropriate overload protection is to be used.
- 13 Earthing is a must for any component in the bidder system that requires earthing.
- 14 Notification by SMS and Email in case of Alarms, failures, or values exceeding certain thresholds.

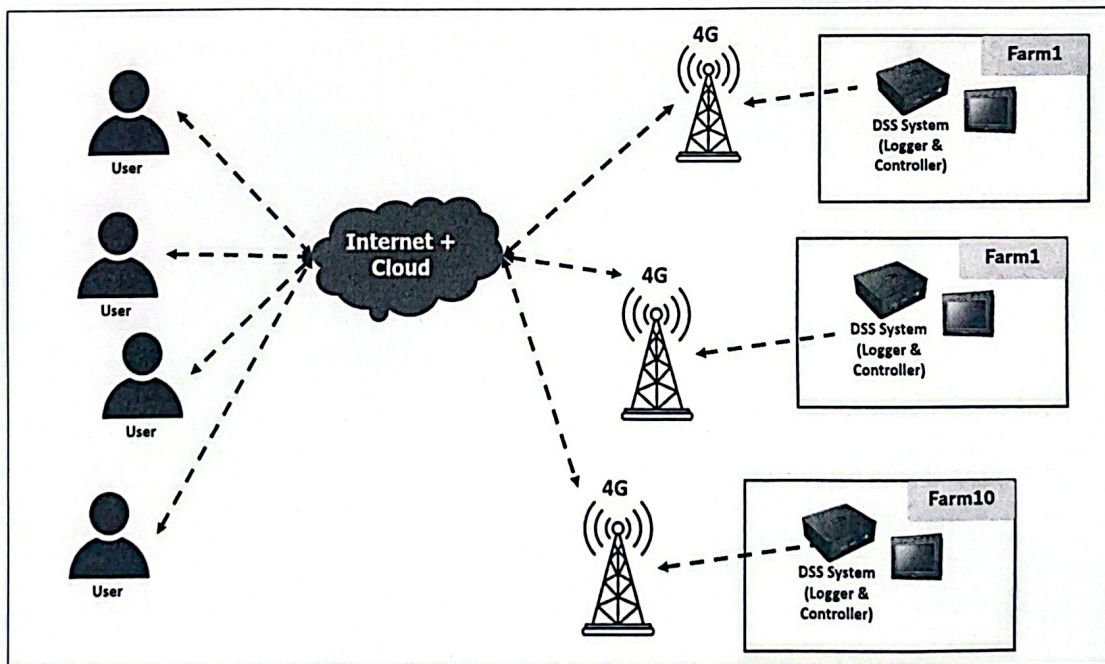
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- 15 The system must detect when there is no flow in the Water Desalination Station and accordingly stop operating and gives notification on the on-site screen and when monitoring the system remotely. In addition to sending notifications via Email/SMS.
- 16 The system must detect when it is not able to mix the water at the desired TDS index and must give notification on the on-site screen and when monitoring the system remotely. In addition to sending notifications via Email/SMS
- 17 A minimum package of 2,500 SMS per farm and 25,000 email per farm valid for 3 years

3. System Monitoring/Communication Diagram

- Local Monitoring & Control is possible from Touch Screen.
- Remote Monitoring & Control is possible from anywhere over the internet.
- Data logging for 12 months.
- NARC users can monitor and control any farm.
- Any Farm owner can monitor and control his own farm only.



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4. Training

The training must include:

- Farmers: how to operate and use the system, how to deal with faults.
- NARC Staff: system operation, extracting logged data, and making reports.

5. Other Requirements

- Submission of project plan is required.
- System Warranty valid for one year
- A total of 10 SIM cards valid for three years each

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6. Checklist for Submission

The bidder is required to include the checklist below in his compatibility matrix upon submission:

No	Item	Compatibility (Yes/No)
Regarding Installations		
A1	The system shall be able to measure the TDS water quality index for each water source individual whenever required by the farmer (with the help of closing/opening valves)	
A2	The system to be installed over a galvanized steel SKID	
A3	Electrical Cabinet mounted over the SKID at suitable height to be used conveniently by the farmer	
A4	Electrical conduits/glands used to connect electrical wires to the Electrical Cabinet	
A5	EC Sensor installed on sub-pipe (at low flow) not on main pipe	
A6	EC Sensor installed on sub-pipe with indication of water flowing/stopped in the sub-pipe	
A7	In case of using pumps, appropriate overload protection is used	
A8	Earthing is a must for any component in the bidder system that requires earthing	
A9	Touch Display of size of 10.1" that enables on-site monitoring and control	
A10	Protective cover for the Touch Display against water	
A11	4G Cellular Router	
A12	4G SIM card valid for 3 years	
A13	Designed system to have a Dry Contact (Relay) to operate the existing Desalination System automatically when required to irrigate by the farmer	
Cloud and Software		
B1	System design is based on Cloud	
B2	The system includes an IoT logger that connects to the cloud	

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B3	<p>Cloud storage for all logged data and alarms for last 12 months. Logged data as a minimum:</p> <ul style="list-style-type: none"> • started run time, ended run time, current run time, current run ID (each run must be given a unique incremental ID) for data analysis by NARC team • set TDS of steam1, set TDS of steam2, Target TDS, output TDS, TDS hysteric (+/-) • output mixed water volume per run, accumulative mixed water volume, resettable mixed water volume • selected running option (Period/Volume) • faults and Operational Alarms 	
B4	Data is logged to the cloud with adjustable interval starting from 2min as a minimum	
B5	Remote software based on cloud for automatic data-log reports, graphic reports, summary reports and alarm reports	
B6	Both Arabic & English user-interface is a must on the Touch Display	
B7	Both Arabic & English user-interface is a must when using mobile/PC for remote monitoring	
B8	Multi-users accessing the system: NARC Users can view all farmers' systems together from mobile and/or PC	
B9	Multi-users accessing the system: Each farm owner can view his own system from mobile and/or PC	
B10	Secure system based on (TSL): Secure communication between Controller/IoT Logger and Cloud	
B11	Secure system based on (TSL): Secure communication between Cloud and User	
TDS Algorithm		
C1	<p>The TDS Algorithm must have the ability to run and start generating mixed water based on either:</p> <ul style="list-style-type: none"> • Run Period required • Output Mixed Water Volume (cubic meters) required 	
C2	The TDS algorithm should reach the target value within 1~2min	
C3	The TDS algorithm should maintain the target TDS within hysteresis +/-50ppm from set value, and should be restored quickly when flow changes	
C4	In case of DSS Mixing System failure, the farmer must still be able to use the existing legacy desalination plant	



C5	The TDS Algorithm must detect when there is no flow in the Water Desalination Station and accordingly stop operating and gives notification on the on-site screen and when monitoring the system remotely. In addition to sending notifications via Email/SMS	
C6	The system must detect when it is not able to mix the water at the desired TDS value and must give notifications on the on-site display and when monitoring the system remotely. In addition to sending notifications via Email/SMS	
C7	Notification by SMS and Email in case of Alarms, failures, or values exceeding certain thresholds.	
C8	For NARC Tracking and Research Purposes, at the end of each run, the DSS algorithm must send an Email summarizing the results per Running Operation to the list of email recipients configured per farm: <ul style="list-style-type: none"> started run time, ended run time, run ID set TDS of steam1, set TDS of steam2, Target TDS, average output TDS, min. output TDS, max. output TDS, TDS hysteric (+/-) output mixed water volume per run, accumulative mixed water volume, resettable mixed water volume selected running option (Period/Volume) faults and any Operational Alarms 	
Resiliency		
D1	In case of internet connection failure, the DSS system must still be functional using the on-site touch display	
D2	In case of internet connection failure, all data (during period of no Internet connectivity) must be logged and then uploaded to cloud server when internet connection is resumed	
Others		
E1	Availability (one requested) of a manual both Arabic/English for the farmers and NARC users that includes system operation, how to deal with faults, extracting logged data, and making reports	
E2	Project plan submitted	
E3	System Warranty valid for one year	
E4	The bidder is required to include in his offer a list and a drawing highlighting all fittings/accessories needed to integrate his system with the existing Water Desalination Station at the farm	



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E5	The bidder is required to mention in his offer the list of fittings required from farmer side (supported by a drawing) to connect to farmer existing desalination system, while keeping these fittings required by the farmer to minimum	
E6	A minimum package of 2,500 SMS per farm and 25,000 email per farm valid for 3 years	

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