

**QUESTIONNAIRE**  
(Revised Version)

**4th**  
**ICID SURVEY**  
on

**WORLDWIDE USAGE OF  
MICRO & SPRINKLER  
IRRIGATION**

*Working Group on On- Farm Irrigation Systems  
(WG-ON-FARM)*



**ICID•CIID**

**INTERNATIONAL COMMISSION ON IRRIGATION AND DRAINAGE  
JANUARY 2006**

## Preamble

The erstwhile Working Group on Micro Irrigation (WG-MICRO) had carried out three worldwide surveys about use of micro-irrigation i.e. in 1981-82, 1986-87 and 1990-91. The micro irrigated area as per the 1991 survey was 1.77 Mha, while it was estimated that more than 3 Mha were micro-irrigated worldwide by the year 2000. The decade 1990-2000 witnessed a quantum leap in adoption of micro irrigation technology, both in developed and developing countries.

The Working Group on On-Farm Irrigation Systems (WG-ON-FARM) at its 3<sup>rd</sup> meeting held at Cape Town, South Africa in October 2000, agreed to prepare a Questionnaire for 4<sup>th</sup> survey on “Worldwide Usage of Micro and Sprinkler Irrigation”.

A questionnaire was prepared and circulated to all National Committees since 2002. However there has been quite low response. Subsequently, the WG took a decision to simplify the questionnaire to re-circulate it amongst National Committees. In light of this decision and considering the new developments in micro and sprinkler irrigation technologies, the 4<sup>th</sup> Questionnaire has been revised and attached herewith.

All the National Committees/Committee of ICID are requested to fill up the questionnaire by latest information, as accurately as possible. It is proposed to compile and publish the information collected through Questionnaire for benefit of all concerned. Please return the filled-in questionnaire to the Central Office, ICID at the earliest (*preferably by 28<sup>th</sup> February 2006*). For any clarification, please do not hesitate to contact the Central Office, at [icid@icid.org](mailto:icid@icid.org).

Looking forward for co-operation from all National Committees/Committee of ICID.

Mr. Felix Reinders  
Chairman, WG-ON-FARM  
(South Africa)

Dr. S.A. Kulkarni  
Director (I)  
Central Office, ICID  
(India)

## TERMINOLOGY

- **Cultivated land:** area under temporary and permanent crops. This refers to the physical area actually cultivated and does not include land, which is temporary fallow (FAO)
- **MIS:** Micro-irrigation systems
- **SIS:** Sprinkler irrigation systems
- **Microirrigation:** includes Drip/Trickle irrigation (2-24 lph), Micro-sprayer (20-150 lph) and Mini/Micro Sprinkler (35-250 lph)

## 1. GENERAL

1.1. Country: \_\_\_\_\_  
 Name(s) and contact details of the person(s) completing this questionnaire:  
 \_\_\_\_\_

1.2. Total Utilizable Water Resources (internal + external) of the country in Billion Cubic Meters (BCM)

Water Resources	Potential	Currently used (Year ___)
Surface		
Ground		
Any other (specify)		

1.3. Average water withdrawal/requirements for different sectors, BCM/Year  
 (year \_\_\_\_\_)

Agriculture	
Industrial	
Domestic	
Hydro-electric	
Other (specify)	

1.4. Per capita water availability (liter/capital/year):

- Actual: \_\_\_\_\_ (year \_\_\_\_\_)
- In the year 2025 \_\_\_\_\_

1.5. Total cultivated land \_\_\_\_\_ Mha (year \_\_\_\_\_)

1.6. Total net irrigated area \_\_\_\_\_ Mha (year \_\_\_\_\_)

1.7. Source wise irrigated land under various irrigation methods. (year \_\_\_\_\_)

Irrigation Method	Surface water (%)	Groundwater (%)
Surface (Basin, furrow, border)		
Sprinkler		
Micro irrigation		

## 2. DEVELOPMENTS

### 2.1. Growth of area under Sprinkler Irrigation Systems (SIS) & Micro Irrigation Systems (MIS)

Year	Sprinkler (ha)	Micro irrigation(ha)	Remarks, if any
1980			
1985			
1990			
1995			
2000			
(year_____)			

### 2.2. Types of sprinkler and micro irrigation systems used in your country (year\_\_\_\_\_)

A	SPRINKLER IRRIGATION	Area (ha)
1	<b>Set systems:</b>	
1.1	<i>Fixed systems:</i> (solid set systems)	
1.2	<i>Periodic-move systems</i> (systems moved between irrigations)	
	▪ Hand-move (fully and semi-portable),	
	▪ Mechanized move -End tow, Side roll laterals and Boom sprinklers.	
2.	<b>Continuous-move systems (irrigation machines):</b> the sprinklers operate while moving in either a circular or a straight path (i.e., travelling guns, enrouleurs, Center pivot, Linear move systems, LEPA, etc.)	
B	<b>MICRO IRRIGATION</b> (micro sprinkler, drip, etc.)	
1.	<b>Drip irrigation</b>	
2.	<b>Subsurface drip irrigation</b>	
3.	<b>Micro &amp; mini sprinkler and bubbler, etc.</b>	
4.	<b>Bucket/Drum kit (Low cost-small holder systems)</b>	

2.3. Major crops irrigated in your country under sprinkler and micro irrigation  
(year\_\_\_\_\_)

<b>Crop</b>	<b>Sprinkler (ha)</b>	<b>Micro irrigation (ha)</b>
<b>1.</b>		
<b>2.</b>		
<b>3.</b>		
<b>4.</b>		
<b>5.</b>		
<b>6.</b>		
<b>7.</b>		
<b>8.</b>		
<b>9.</b>		
<b>10.</b>		

2.4. Crops to which sprinkler and micro irrigation were recently extended

<b>Sprinkler irrigation</b>	<b>Micro irrigation</b>

2.5. Water saving and yield increase for most common sprinkler and micro irrigated crops compared to previous methods.

<b>Crop</b>	<b>Current method</b>	<b>Water savings %</b>	<b>Increase in yield%</b>	<b>Old method</b>
<b>1.</b>	<b>SIS/MIS</b>			<b>SIS/surface</b>
<b>2.</b>	<b>SIS/MIS</b>			<b>SIS/surface</b>
<b>3.</b>	<b>SIS/MIS</b>			<b>SIS/surface</b>
<b>4.</b>	<b>SIS/MIS</b>			<b>SIS/surface</b>
<b>5.</b>	<b>SIS/MIS</b>			<b>SIS/surface</b>

2.6. Micro irrigation and green houses (year\_\_\_\_\_)

<b>Total area under greenhouses (ha)</b>	
<b>Area irrigated by micro irrigation in green houses (ha)</b>	

2.7. Sizes of sprinkler and micro irrigated farms

	<b>Sprinkler</b>	<b>Micro irrigation</b>
<b>Large farm size (range)</b>	...ha	...ha
<b>Small farm size (range)</b>	...ha	...ha
<b>Average farm size (range)</b>	...ha	...ha

2.8. Who designs and installs sprinkler and micro irrigation systems for farmers?  
(Please check)

<b>Agency/Institution</b>	<b>Sprinkler</b>		<b>Micro irrigation</b>	
	<b>Design</b>	<b>Instal.</b>	<b>Design</b>	<b>Instal</b>
<b>Government agency (extension agency/ irrigation advisory services/university)</b>				
<b>Representatives/authorised dealers or technicians of manufacturers</b>				
<b>Private Consulting firms/engineers</b>				
<b>Farmers themselves</b>				
<b>Other (specify):</b>				

(Please check as applicable)

	<b>SIS</b>		<b>MIS</b>	
	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>
<b>2.9. Is application of fertiliser practiced in your country through SIS &amp; MIS? (generally speaking)</b>				

	<b>SIS</b>		<b>MIS</b>	
	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>
<b>2.10. Do water quality standards for irrigation exist in your country?</b>				

	<b>SIS</b>		<b>MIS</b>	
	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>
<b>2.11. Is any research being conducted into use of <u>sewage/saline</u> waters for SIS &amp; MIS?</b>				

	<b>MOST OF THE TIMES</b>	<b>NO/EXCEPTIONALLY</b>
<b>2.12. Is water quality testing carried out prior to design/installation of SIS &amp; MIS?</b>		

2.13. Subsidies for sprinkler and micro irrigation systems (year\_\_\_\_\_)

Particulars	SIS		MIS	
	YES	NO	YES	NO
<b>Is there subsidy available for the purchase of SIS &amp; MIS</b>				
<b>If YES who gives the subsidy?</b>				
▪ <b>Federal/Central government</b>				
▪ <b>State/Province government</b>				
▪ <b>Manufacturers/distributors</b>				
▪ <b>Farmers co-operatives</b>				
▪ <b>Voluntary organisation</b>				
<b>If YES what's the amount in US\$/ha?</b>				
<b>Details on the subsidy structure adopted for SIS &amp; MIS in your country</b>				

2.14. Please provide appropriate estimates for the following costs (year\_\_\_\_\_)

Type of SIS/ MIS	Annual labour, maintenance, repair and replacement costs (US\$/ha)	Annual Energy Cost of pumping (US\$/ha)	Energy requirement [excluding/including pumping] (Kwh/ha)
<b>SPRINKLER</b>			
<b>Solid set</b>			
<b>Hand move -Semi portable</b>			
<b>Hand move -Fully portable</b>			
<b>End tow</b>			
<b>Side roll laterals</b>			
<b>Side roll laterals with or without trail lines</b>			
<b>Gun boom sprinklers</b>			

<b>Irrigation machines</b>			
▪ <b>Center pivot</b>			
▪ <b>Linear move</b>			
▪ <b>Travelling sprinkler</b>			
<i>Other (specify)</i>			
<b>MICRO IRRIGATION</b>			
<b>Drip irrigation</b>			
<b>Subsurface drip</b>			
<b>Micro &amp; mini sprinkler and bubbler, etc.</b>			
<b>Bucket/Drum kit</b>			

2.15. Please provide information on typical or average range of initial capital cost for SIS & MIS in your country (year \_\_\_\_\_)

Type of crop	Spacing RxP (MxM)	Type of SIS	Type of MIS	Cost US\$/ha	Actual*	
					Actual*	Subsidised*
Trees/Orchards						
Grapevine						
Vegetables						
Flowers						
Field crops (Corn, wheat, Sugar beat, etc)						
Cotton						
Sugarcane						
<i>Others(specify)</i>						
Plastic/green houses						

RxR: Row to Row spacing  
PxP: Plant to Plant spacing

\* Please check

- Please do not include in the initial investment cost: the cost of water source creation, pumpsets for lifting and conveying water up to field, and pipes for conveyance of water up to fields
- Include the cost of pumpset, main, submain pipes, control head and other accessories as an integral part of the SIS/MIS system.

2.16. Use of different energy sources for operation of irrigation systems (ha).

(Please check )

Irrigation system	Electricity	Diesel	Gravity force	Solar	Wind	Combination of	Other (specify)
Surface							
Micro							
<b>Sprinkler:</b>							
• <i>Set systems</i>							
• <i>Irrigation machines</i>							

2.17. Impacts of energy costs on expansion of area under the given irrigation system

(Please check )

Irrigation Method	Very high	High	Average	Low	Nil
Surface					
Micro					
<b>Sprinkler:</b>					
Set systems					
Irrigation machines					

2.18. Is the energy cost for irrigation systems subsidised in your country?

YES

NO

Present Energy Cost: ----- US \$/Kwh ; Range of subsidy: \_\_\_\_\_ US \$ per Kwh

2.19. How irrigation water is priced in your country? (Please check )

Volumetric basis	<input type="checkbox"/>
Area basis	<input type="checkbox"/>
Area and crop basis	<input type="checkbox"/>
Other (specify):	<input type="checkbox"/>

2.20. What is the cost of canal/surface irrigation water for the farmers, in your country? (year\_\_\_\_\_)

US\$ _____/1000m <sup>3</sup>
US\$ _____/ha

(Please check  $\checkmark$ )

	SIS		MIS	
2.21. Are ISO standards pertaining to irrigation equipments (ISO/TC23/SC18) followed in your country?	YES	NO	YES	NO
	SIS		MIS	
2.22. Whether your country has developed/developing your own national standards	YES	NO	YES	NO

	SIS		MIS	
2.23. Is there any testing facility for evaluating performance of irrigation system components (e.g. sprinkler heads, emitters, filters, laterals, etc.)	YES	NO	YES	NO

2.24. Is any performance evaluation of SIS/MIS installed on fields, carried out in your country? If YES, which performance parameters are evaluated in the field?

(Please check  $\checkmark$ )

YES  NO

Field application efficiency (Ea)	<input type="checkbox"/>
Field emission uniformity (EU)	<input type="checkbox"/>
Coefficient of Uniformity for Sprinkler System (CU)	<input type="checkbox"/>
Other ( Please Specify)	

	SIS		MIS	
2.25. Is there an adequate coverage in the syllabus about SIS/MIS at graduate/post graduate level education in your country?	YES	NO	YES	NO

	SIS		MIS	
2.26. Is there specialised Institution for training/capacity building of staff/technical persons in various aspects of SIS/MIS?	YES	NO	YES	NO

	SIS		MIS	
2.27. Is there facility for training farmers in adoption, operation & maintenance of SIS/MIS?	YES	NO	YES	NO

2.28 Do you adopt specific strategies and management principles in your country to tackle water scarcity? If yes, please list at least three of those.

YES

NO

1.....

2.....

3.....

2.29 Is there use of poor quality waters for microirrigation in your country? If the answer is yes, please specify which.

YES

NO

1. Sewage waters

2. Drainage water

3. Saline water

4. other:.....

2.30 please provide feed back on the problems faced and lessons learnt in adoption of SIS/MIS in your country, in respect of (Please elaborate – in addition to above stated information)

- Planning, design and installation
- Availability of suitable pumpsets and system components
- Investment cost of the system
- Providing subsidy to the farmers
- Quality of various components
- Testing of equipments
- Water availability and quality
- Energy supply
- Operation and maintenance (O&M) aspects
- Scheduling of SIS/MIS
- Fertigation
- Chemigation
- Automation of SIS/MIS
- After sale services by manufacturers
- Damage from rodents, squirrels, insects, etc.
- Extension advisory services for farmers, especially for SIS/MIS
- Training of professionals, technicians and farmers
- Other:

