

**Manual  
of  
Gate Rehabilitation  
by Farmers Participation  
On  
The Secondary canals in Maliana I  
Irrigation Scheme**

**October 2022**

**The Project for Increasing Farmers  
Households' Income through Domestic  
Rice Production**

# **1. Introduction**

## **Current Situation of Gates on the Secondary Canals**

# **(1) Many of gates are out of function or already removed.**



Handle was removed  
(No.6 Ritabau)



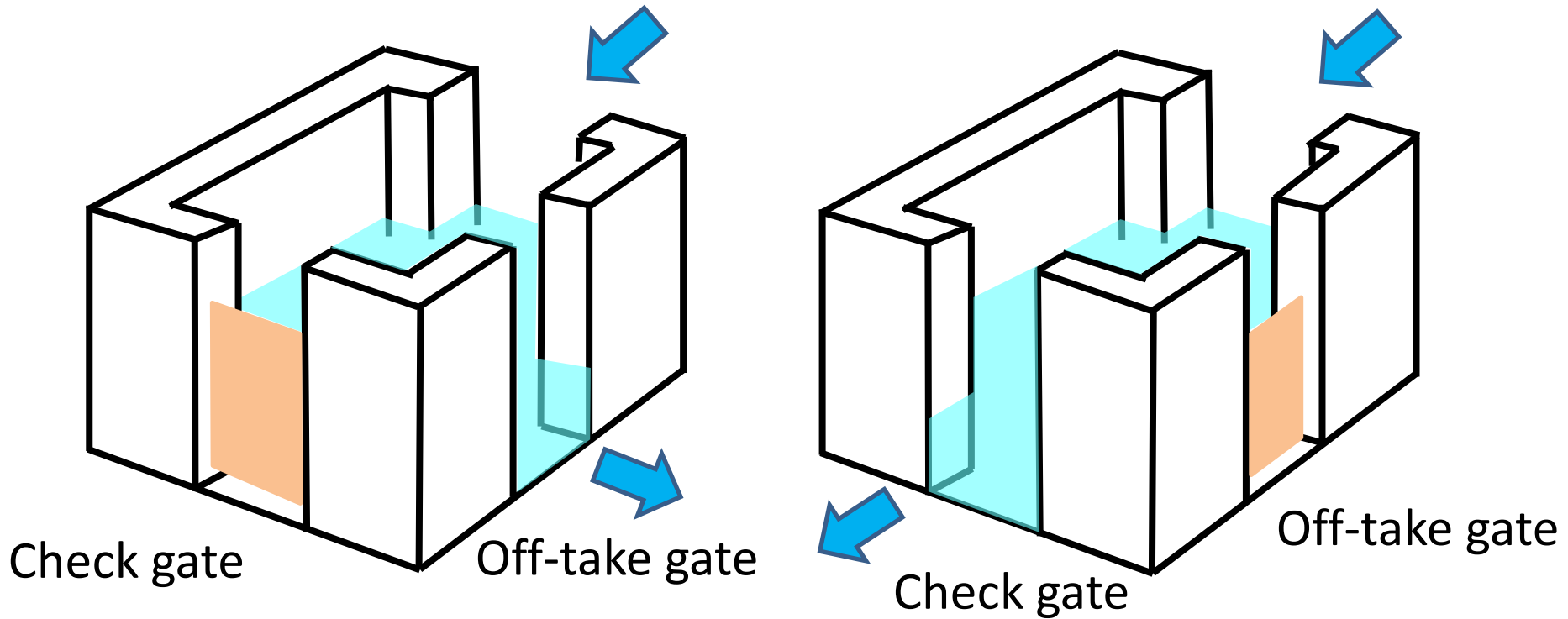
Disconnection  
(No.6 Ritabau)

# **(1) Many of gates are out of function or already removed.**



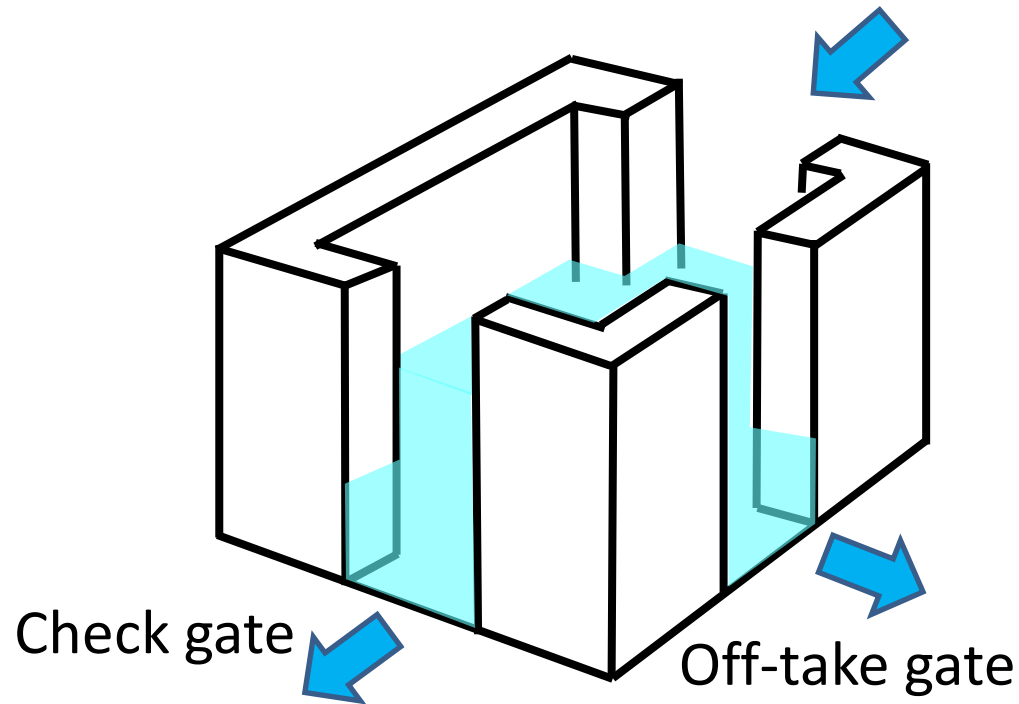
**Both Sluice gates Removed  
(No.7, Ritabau)**

## (2) Planned operation of gates



Rotation irrigation by gate operation

### (3) If gates are malfunction...



Irrigation water is shortage both sides



## **(4) However, steel gate is expensive...**



Original steel gate is  
over 2,000 USD / pc.

## **2. Proposed gate type**



# **(1) Required for new gates**

Rehabilitation of gates shall be done by farmers (WUA)

For selecting gate type following points are considered.

- Inexpensive
- Materials is available in Maliana
- Theft-proof

## (2) Proposed gate



Wooden Stop log with chain

## (2) Proposed gate



Strong points:

- Stop log is fixed by chain
- Easy to make
- Adjustable the height of stop log and regulatable the water volume

Wooden Stop log with chain

# **3. Material & Tools**





# (1) Materials for Proposed gates

No.	Item	Photo	Where to buy
1	Stop log		Carpenter shop
2	Bolt & nut	 	Hardware shop



# (1) Materials for Proposed gates

No.	Item	Photo	Where to buy
3	Used chain (mortar bike)		Body shop (free)
4	Wooden board		Carpenters shop

# (1) Materials for Proposed gates

No.	Item	Photo	Where to buy
5	Welding rods		Hardware shop



## (2) Cost of Materials

Estimated cost of the materials (each gate)

No.	Items	Q'ty	Unit	Unit price (\$)	Amount(\$)
1	Stop log	1	Pc	30.0	30.0
2	Bolt & nut	1	Set	5.0	5.0
3	Chain	1	Pc	Free	0.0
4	Wooden board	1	Pc	9.0	9.0
5	Welding rods	1	set	10.0	10.0
	Total				54.0

### (3) Necessary tools

Following tools are procured by the Domestic Rice Project and stored in the WUA office




No.	Item	Photo	Use application
1	Welding machine (Protective glasses)		Welding bolts and nut for thief-proof
2	Drill		Making holes on stop log & wooden board

# (3) Necessary tools

No.	Item	Photo	Use application
3	Generator		Electricity resource for welding machine and drill
4	Saw		Cutting and adjusting a length of wooden board






### (3) Necessary tools

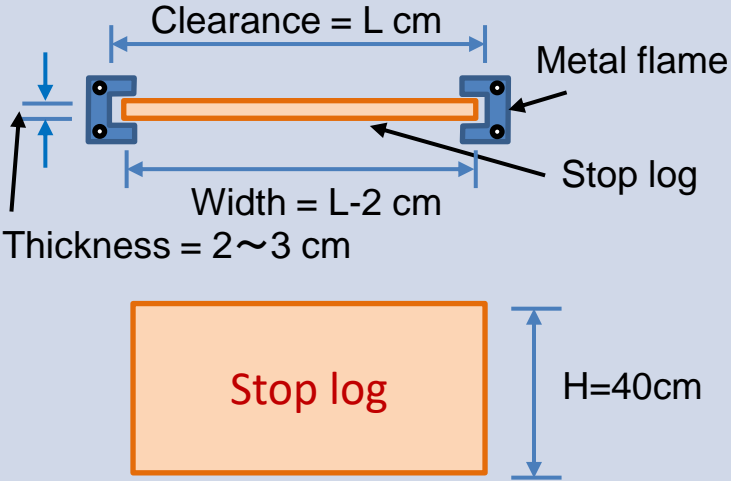

No.	Item	Photo	Use application
5	Convex		Measuring the width of gates, fixing the holes position on wooden board, measuring the length of wooden board
6	Hammer		Driving nails, miscellaneous
6	Wrench		Removing existing damaged steel gate

# **4. How to Make Stop Log**




# How to make stop log (1/11)

No.	Description	Photo
1	Remove existing steel gates.	 A photograph showing two men working on a concrete structure. One man, wearing a white t-shirt and grey pants, is using a tool to remove a steel gate. Another man, wearing a white shirt and a cap, is assisting him. The structure appears to be a part of a water control system.
2	<p>Measure the clearance of metal frames for deciding the width of stop log.</p> <p>Also, confirm the distance of bolt holes for positioning the drilling holes on wooden board</p>	  Two photographs showing the measurement process. The left photo shows a man using a long metal rod to measure the clearance of a metal frame. The right photo shows a man using a tape measure to confirm the distance of bolt holes on a wooden board.

# How to make stop log (2/11)




No.	Description	Photo
3	Decide the size of a stop log from measurement of metal flame.	 <p>The diagram illustrates the assembly of a stop log. It shows a blue metal frame with two vertical posts. An orange stop log is placed between the posts. The distance between the posts is labeled 'Clearance = L cm'. The width of the stop log is labeled 'Width = L-2 cm'. The thickness of the stop log is labeled 'Thickness = 2~3 cm'. The height of the stop log is labeled 'H=40cm'. The stop log is labeled 'Stop log' in red text. The metal frame is labeled 'Metal flame'.</p>
4	Order a stop log to a carpenter shop	 <p>A photograph showing a carpenter working on a large wooden structure, likely a stop log, in a workshop setting. The carpenter is using a tool to work on the wood. The structure is made of several large wooden planks joined together.</p>

# How to make stop log (3/11)



No.	Description	Photo
5	<p>Prepare the necessary materials, such as chain, bolt &amp; nut, wooden board, etc.</p> <p>Also, check the condition of tools which stored in WUA office.</p>	 <p>Selecting bolt &amp; nut</p>
6	<p>Check the position of holes on metal frame for drilling the holes on wooden board accurately.</p>	  <p>Holes on Metal frame</p>





# How to make stop log (4/11)

No.	Description	Photo
7	<p>Drill the holes on a wooden board and reaming holes to adjust to bolt size.</p>	
8	<p>Make a slit (2cm x 2cm) on wooden board like below drawing by saw for fixing chain.</p> <div>  </div>	

# How to make stop log (5/11)

No.	Description	Photo
9	Drill a hole on the center of a wooden board for fix chain by bolt & nut.	
10	Fix chain to a wooden board by bolt & nut	

# How to make stop log (6/11)

No.	Description	Photo
11	Chain is fixed at a slit of a wooden board to enhance durability.	 A close-up photograph showing a person's hands using a yellow power drill to create a slit in a wooden board. The board is held steady by another person's hands. A black chain is visible, attached to the board. A blue toolbox is open on the ground nearby.
12	Drive a nail on the side of a wood board to hook the chain and adjust the height of stop log.	 A close-up photograph showing a person's hands using a hammer to drive a nail into a wooden board. The board is held steady by another person's hands. A black chain is visible, attached to the board. A blue toolbox is open on the ground nearby.



# How to make stop log (7/11)

No.	Description	Photo
13	Marking a position of bolt & nut to fix stop log and chain.	 A close-up photograph showing a person's hands using a yellow power drill to mark a position on a wooden stop log. The drill is held vertically, and the person is using a metal rod to mark the wood. The log is lying on the ground, and the person is wearing a white shirt and a cap.
14	Drill a hole on the stop log	 A photograph showing a person using a yellow power drill to drill a hole into a wooden stop log. The log is lying on the ground, and the person is wearing a white shirt and a cap. The drill is held vertically, and the person is using a metal rod to mark the wood.

# How to make stop log (8/11)


No.	Description	Photo
15	Fix chain to stop log by bolt & nut.	 A close-up photograph showing several pairs of hands working on a wooden structure. One person is using a yellow-handled screwdriver to tighten a bolt through a hole in a wooden beam. Another person is holding a metal chain, which is being attached to the bolt. The structure appears to be part of a larger assembly, possibly a stop log.
16	Installation of stop log to metal frame.	 A photograph showing a group of about seven men working on a large metal frame structure. The structure is made of heavy metal beams and is supported by concrete blocks. One man is standing on a concrete block, while others are standing on the ground. They are all looking at the structure, and one man is holding a tool. The structure appears to be a stop log or a similar device used in construction or agriculture.



# How to make stop log (9/11)

No.	Description	Photo
17	Welding bolt & nut fixing wooden board and metal frame.	 A man in a blue shirt is kneeling on the ground, welding a bolt and nut to a wooden board. The board is part of a metal frame. A yellow welding machine is on the ground next to him. Another person is standing nearby.
18	Welding bolt & nut fixing stop log and chain.	 A close-up view of a man welding a bolt and nut to a wooden board. The board is part of a metal frame. A yellow welding machine is on the ground next to him.

# How to make stop log (10/11)

No.	Description	Photo
19	Welded bolt & nut fixing wooden board and metal frame.	
20	Welded bolt & nut fixing stop log and chain.	

# How to make stop log (11/11)



Completion  
(Replaced gates by farmers)



# For wise use of limited irrigation water!

