

Supplementary Materials

Table S1. Estimation of groundwater seepage from the field to the open drainage (Wg3).

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Salinity in water (g L ⁻¹)													
Drainage water ^{*1}	2.2	3.1	3.2	3.0	2.4	2.2	2.4	2.5	2.2	2.3	2.4	2.6	
Groundwater ^{*2}	7.2	8.2	9.1	8.1	8.0	8.6	7.2	7.0	8.3	9.9	9.1	8.3	
Input water in depth (mm)													
Irrigation water ^{*3}	116	55	69	84	107	131	135	128	120	91	71	62	1,169
Precipitation ^{*4}	27	43	63	18	14	3	2	0	0	8	44	37	259
Total	143	98	132	102	121	134	137	128	120	99	115	99	1,428
Open drainage water in depth (mm)													
Amount of discharge ^{*5}	78*	23	25	0	49	13	5	55	56	89*	115	87*	595
Estimation for seepage													
Amount of seepage ^{*6} (mm)	15	7	7	0	10	2	1	14	9	13	20	19	117
Seepage rate ^{*7} (%)	10	7	5	0	8	1	1	11	8	13	17	19	8

Note: The observation site is located in Yangiobod WCA, Mirzaobod District (refer to Figure 1b). There is no subsurface drainage system in the WCA. The data for irrigation water and precipitation was obtained from local organization. The procedure for calculating the groundwater seepage volume from field to open drainage is as follows: (1) To estimate the proportion of groundwater seepage in the open drainage water by analyzing data from the salt concentration in the drainage water ^{*1}, the groundwater ^{*2}, and the canal water (1.0 g L⁻¹) which overflows from irrigation canals into the drainage. The estimation is under the presumption that the open drainage water could be composed of the groundwater seepage and canal water. Since the surface runoff from the fields to the open drainage was not observed around the fields, we may leave aside the possibility that the surface runoff flows into the drainage. (2) To estimate the amount of input water which was distributed irrigation water ^{*3} without the conveyance loss (27.7%, [25]) plus precipitation ^{*4}. (3) To estimate the amount of the groundwater seepage ^{*6} by multiplying the open drainage discharge ^{*5} by the obtained proportion of ground water seepage. Note that missing data for the open drainage water in January, October, and December (*) are complemented by averaging the value before and after the month. (4) To calculate the groundwater seepage rate ^{*7} by dividing the amount of groundwater seepage by the amount of input water. The applied seepage rate (12%) during the experimental period is presumed to be an average value for January, February, and December.

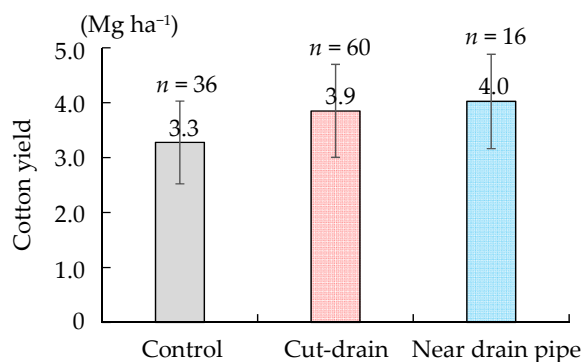


Figure S1. Cotton yield in the experimental field, 2017. Note: The yield survey was conducted on 13 and 14 September 2017 [26]. Error bars represent the standard deviation. The figure above the bar shows yield. The *n* represents the number of the sampling points. The analysis of variance resulted in significant differences ($p < 0.01$).