



Water treatment in the Oasis of Figuig – MOROCCO

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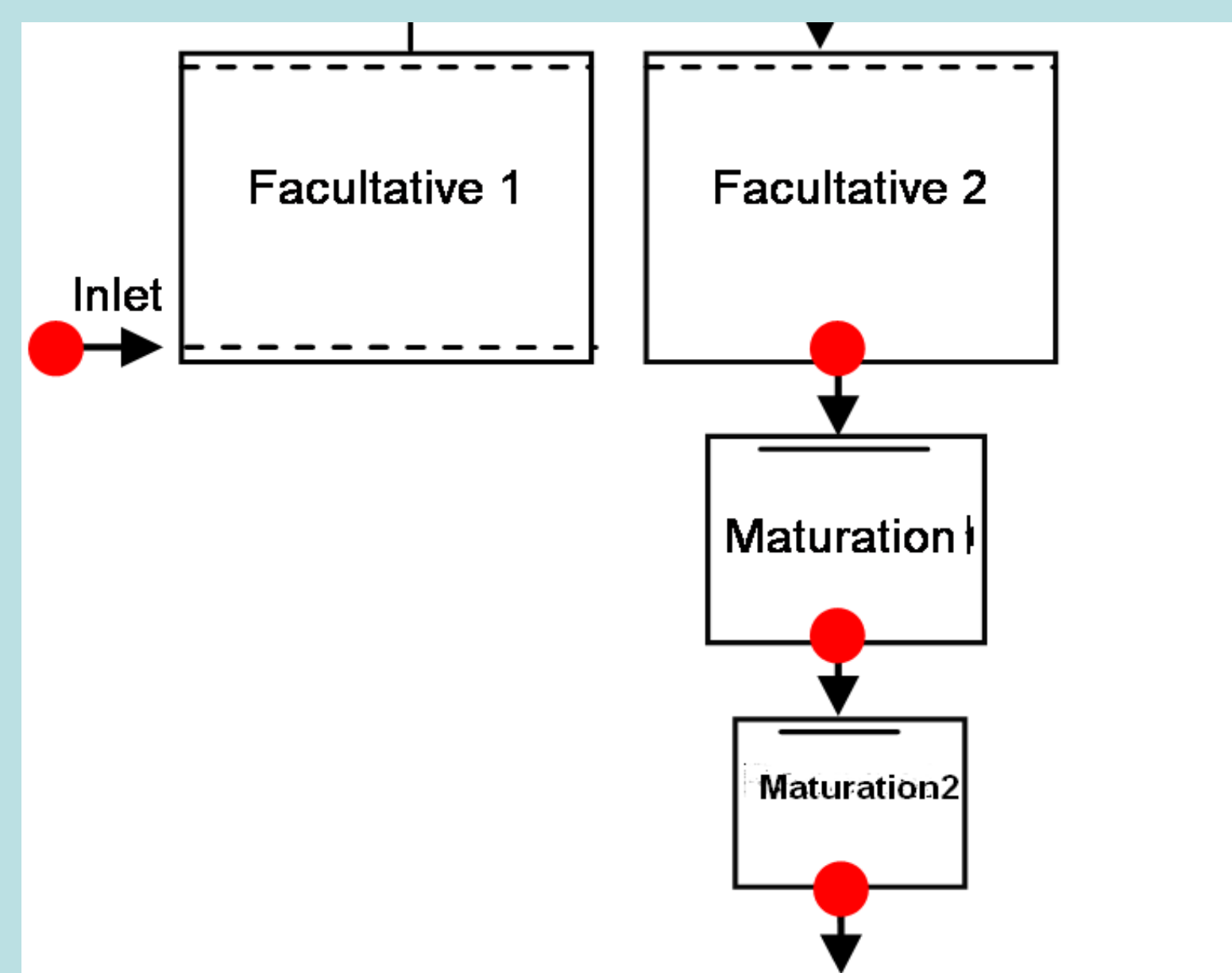
Introduction:

The Oasis of Figuig (Morocco) is located in Morocco's far South-east, near the Algerian border. Water resources are scarce in the Oasis and the sanitation is very poor.

The Hammam Foukani is a district of the city of Figuig which arranges a waste water treatment pond (WWTP). This one started operating in 1998 and has 4 ponds in series (2 facultative and 2 maturation pond). The population served is approximately 1200 PE and has an average flow of circa 70 m³/day.



Maturation 1 and 2 ponds view



Flow diagram of Hammam Foukani's WWTP and sampling points

Methods:

Design characteristics of the WSP of Hammam Foukani.

Ponds	Volume (m ³)	Surface (m ²)	Depth (m)	HRT (days)
Facultative 1	812	650	1,25	10
Facultative 2	812	650	1,25	10
Maturation 1	244	315	1	3
Maturation 2	200	100	2	1

HRT: hydraulic retention time

A monitoring programme was conducted from October 2008 to November 2009 making a total of 8 campaigns (2 campaigns per season). Samples were taken in each unit process of the WWTP (red marks). Analyses were performed according to Standard Methods (APHA, 2005)

Results

Parameters	Inlet	Facultative 1	Facultative 2	Maturation	Reservoir	Total removal
pH	7,4	8,1	8,2	8,4	8,4	-
EC (mS/cm)	3,2	3,3	3,4	3,4	3,4	-
COD (mg/L)	556	320	254	233	225	58 %
BOD ₅ (mg/L)	350	290	210	177	175	51 %
SS (mg/L)	289	190	174	155	151	48 %
N-NH ₄ ⁺ (mg/L)	42	29	230	17	17	57 %
P-PO ₄ ³⁻ (mg/L)	11	7	6	5	4	60 %
FC (Ulog)	7,7	6,6	5,7	4,7	4,4	3,3 Ulog

Conclusion

The WSP performed take into account the short HRT (Hydraulic Retention Times) of the original design. The sanitary quality of the final effluent met the irrigation water standards for restricted irrigation the entire year according to the World Health Organization recommendations (WHO, 1989) and the draft of the future Moroccan legislation on wastewater reuse. According to this, the final effluent could be used for the irrigation of trees.

Organic matter (BOD₅, COD) and SS concentration at the final effluent were high, due to the high organic load that receives the pond and the short HRTs.