



Dammed-up problems: challenges and difficulties in small-holder irrigation agriculture in south-western Burkina Faso



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The adequate distribution of water over time as well as its efficient use is one of the major challenges for irrigation agriculture in south-western Burkina Faso. Small dams are so far the most commonly used practice to store rainfall water in the rainy season and to enable irrigation agriculture in the dry season.

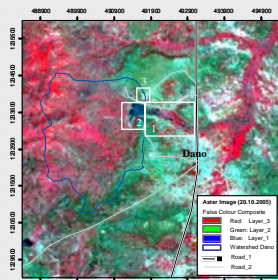
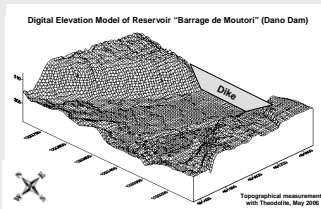
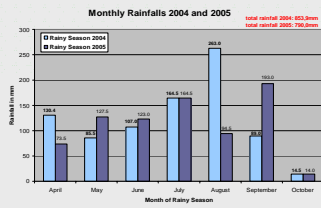
But in which way are micro dams a viable option particularly to small-scale farmers, given the problems of farmers' capacity to organise themselves effectively in addition to agro-ecological and economic concerns?

Agro-economical and social constraints and benefits

- Relation flooded land surface / utilized irrigation perimeter
- Number of crops per year with / without irrigation
- Crop profitability and marketing
- Water use efficiency

Water availability and requirement calculation for the small reservoir "Moutouri" near Dano, southwestern Burkina Faso	
Lake surface in 2005 (max. ext.) 13 ha 130.000 m ²	Available water quantity ^{a)} in lake 190.620 m ³
Perimeter area 18 ha 180.000 m ²	Irrigation water requirement of crop 1 ^{b)} 200 mm 36.000 m ³
	Irrigation water requirement of crop 2 ^{c)} 600 mm 108.000 m ³
	Irrigation water requirement of crop 3 ^{d)} 600 mm 108.000 m ³
	Total annual irrigation water requirement 1.400 mm 252.000 m ³
	Difference of required to available water ^{e)} 252.000 m ³ ^{f)} -61.374 m ³

Conclusion: Water deficit in a dry year is too great to satisfy three crops. The lake surface would have to be at least the size of the cropped land surface to achieve this goal, which in turn depends on the catchment area (see table on the right). In 2005 even the cropped area of the second crop had to be reduced, because irrigation water use during the rainy season was above the usual 200 mm.



1. Irrigation Area
2. Dano Dam
3. Scientific Research Center, Dreyer Foundation

Socio-ethnological background and concerns

- Farmers organization and management structures
- Acephal society of the Dagara in southwestern Burkina Faso
- Livestock during dry season as a hazard to crops
- Labor availability
- Priority setting towards small reservoir irrigation



Ecological and hydrological potentials and limitations

- High intensity of rainfalls
- Soil erosion on Ioba mountains
- Deposition and siltation in reservoir
- Changes in reservoirs morphology
- Decrease of water storage capacity
- High evaporation losses from water surface with high surface-volume ratios
- Decrease of water storage capacity

Irrigation Water (Dano)	Area (ha)
Water surface of dam (max. extent, end of rainy season)	21 (2004) 13 (2005)
Catchment area of Dano (contributing area)	785
Irrigation area (cultivated fields at the end of the rainy season)	18 (2004) 14 (2005)



Catchment Area of Dano



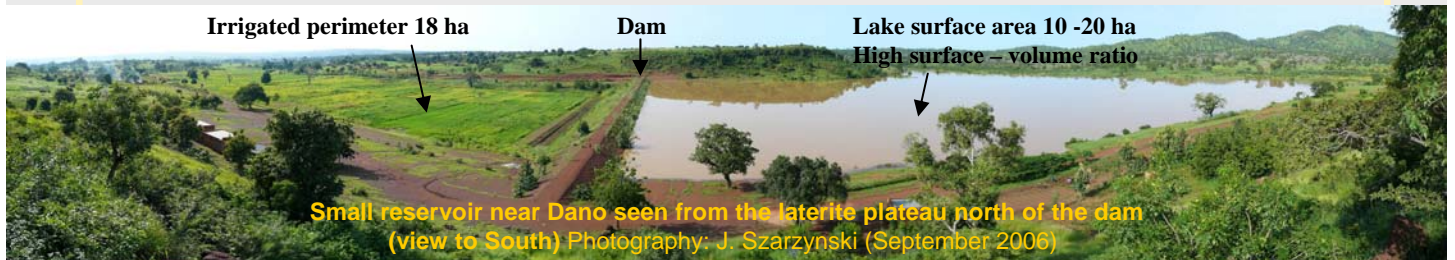
Lake Surface Sediments



Dano small reservoir & perimeter



Accumulated Soil Layer



Dano Dam, Dry Season, May 2006; Photo: Schmengler

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Dano Dam, Rainy Season, Sept. 2006; Photo: Schmengler