Water availability for dry season irrigation in the Anayari watershed in Ghana

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Key messages

- Farmers resilience to climate change could be increased by upscaling irrigation potential levels in Anayari watershed.
- Groundwater irrigation efficiencies need to be improved and maintained from the current 28-54% to above 70% to ensure long-term groundwater sustainability.
- Groundwater irrigation from shallow wells is about 840ha while surface water / small reservoir irrigation is 217ha.
- Upscaling irrigation from the current 1057ha to cover the full potential of 4600ha could lead to about 0.01% reduction in streamflow from into Akosombo dam which is not significant.

Objective

- Assessing the feasibility of dry season vegetable production and supplementary irrigation in the Anayari sub-basin.

Approach

- Quantification of surface water (streamflow and storage of water in dams and dugouts) using hydrological modeling, PGIS +Water Quality Analyses
- Quantification of groundwater resources - pumping test evaluation
- Water demand assessment; Water allocation in WEAP

Key results

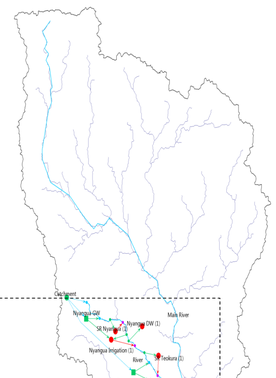
- Main use of water - Domestic and Dry season irrigation (Okro, Tomatoes, pepper and Cabbage)
- Almost every farm has a hand-dug well with farm sizes < 0.2ha;
- Shallow wells (< 11m) dry up in the dry season (Feb-May);
- Deep Groundwater (Boreholes >50m deep) are sustainable for dry season vegetable irrigation with yields up to 120 l/min with 98% recovery rate and recharge rates between 20 - 130 mm/annum;
- Potential land that could be put to dry season surface (small reservoirs) and ground water irrigation is ≈46 km^2 or 4600 ha

Significance

Anayari catchment area ≈ 542km^2. About 7% (37 km^2) and 2% (9.3 km^2) of the catchment area could be sustained by groundwater and surface water dry season vegetable irrigation. This implies that to increase the resilience of farmers in the study area, from water availability perspective, there is a need to supply them with mechanised boreholes in addition to efficient management of the small reservoirs in the catchment to avoid water shortages in the months of February - May. Water access will need to be complemented with farm inputs, access to credits and market to benefit from dry season production system.

Scaling potential

- More than 18,000 farmers could benefit from sustainable irrigation using mechanised boreholes with depth over 50m in the dry season.



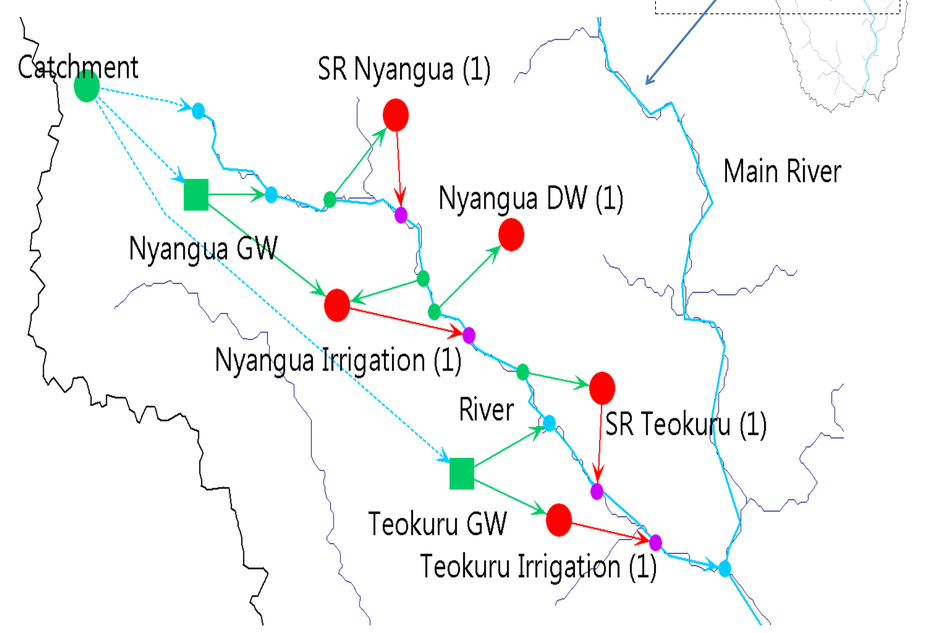


Fig. 1: Catchment and Schematic of water allocation

Fig. 2: Bore Holes, Reservoirs, Irrigated Areas in Nyangua

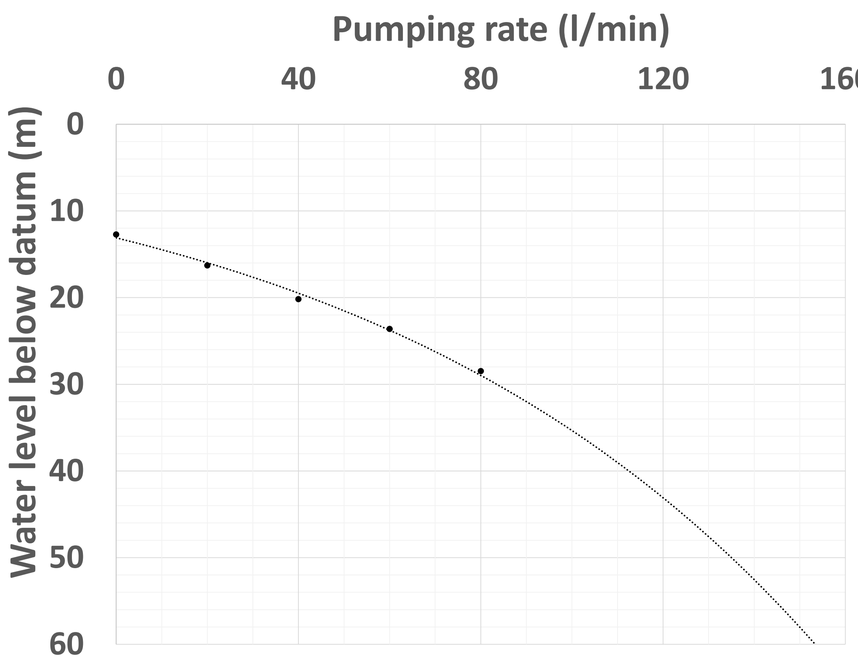


Fig. 3: Performance curve for a borehole at Nyangua

Partners

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