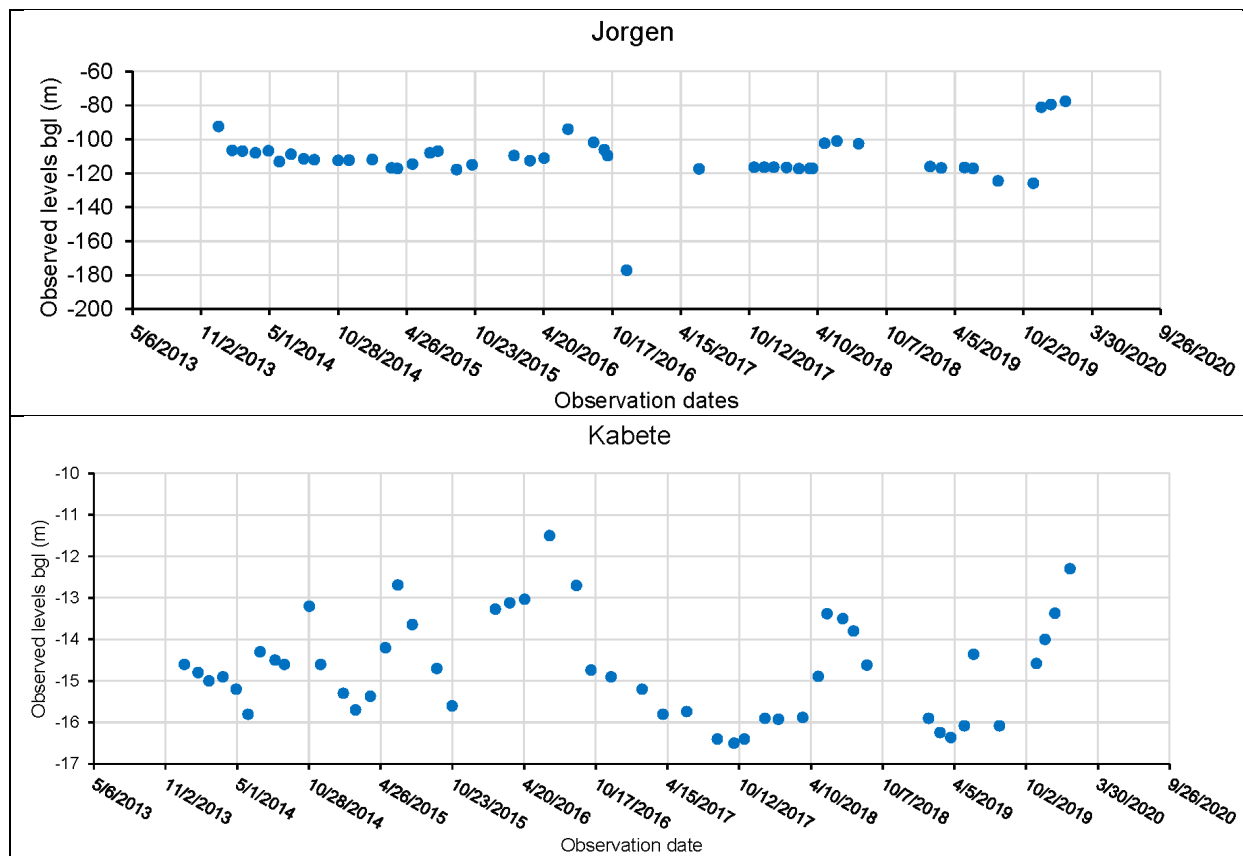


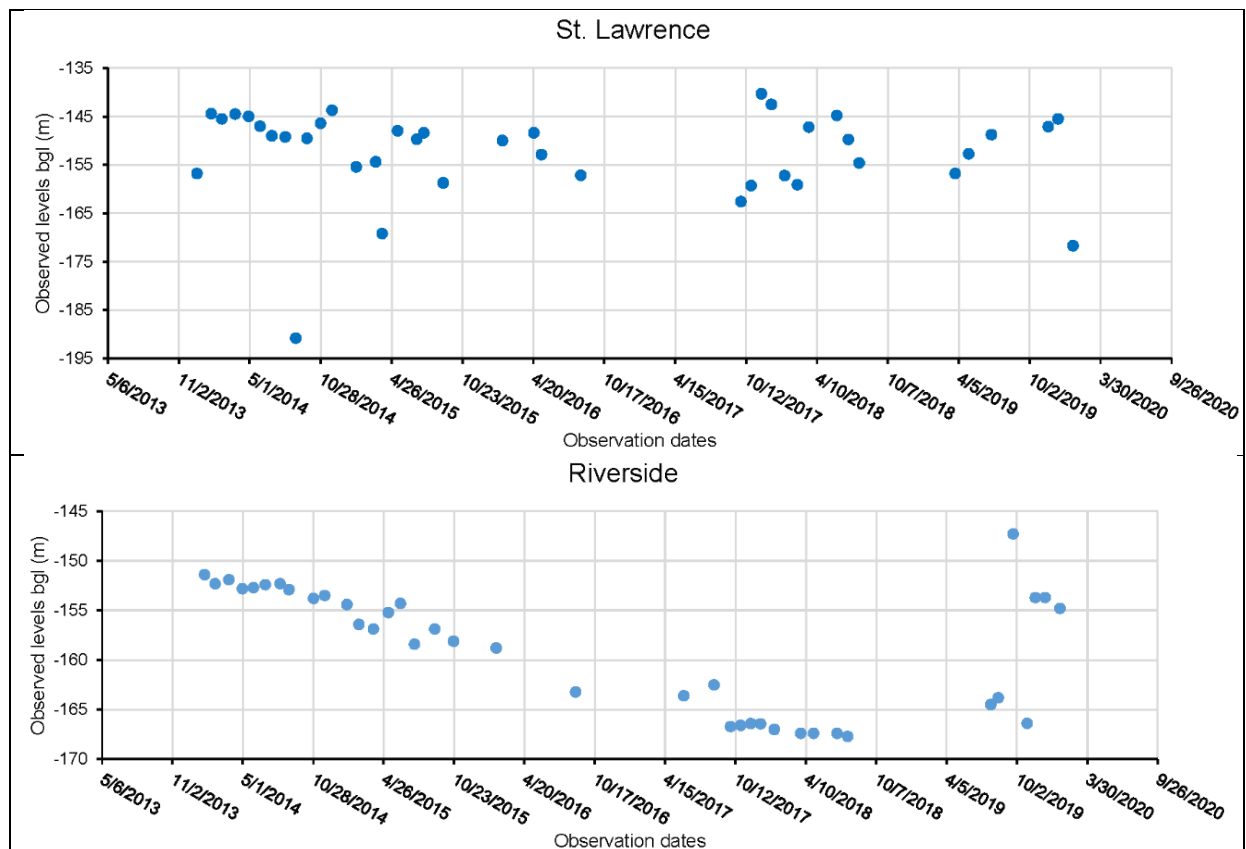
## CHANGES IN ANNUAL RAINFALL AND EXTREME PRECIPITATION PATTERNS IN GROUNDWATER RECHARGE

*The case study of Nairobi aquifer monitoring stations area demonstrate the contribution of rain events to groundwater recharge. The observation is a representative of what happens in other aquifers within the country and how rain periods manipulate aquifer replenishment.*

### Observed groundwater levels (Nairobi sub-region)

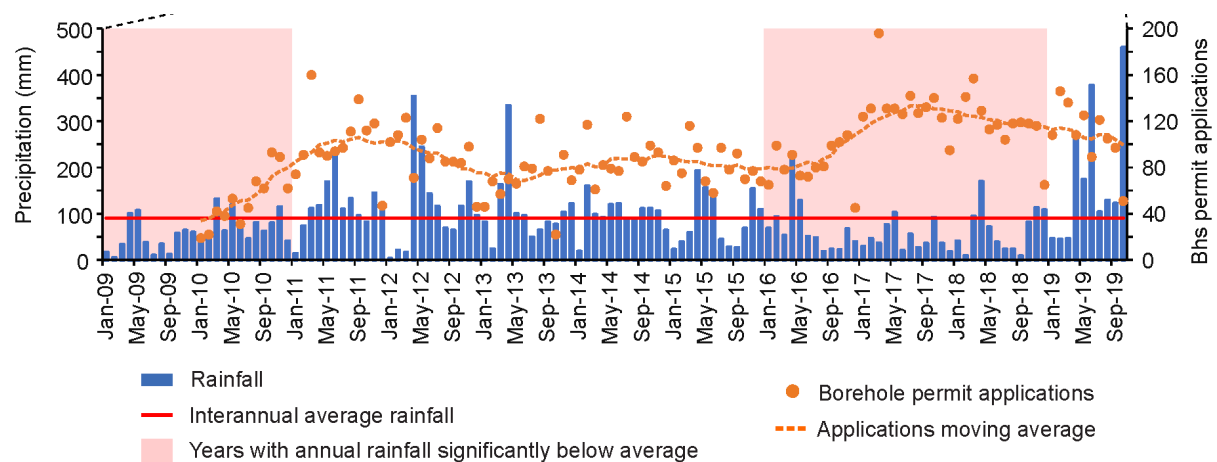
Depth to groundwater level from WRA monthly monitoring boreholes within Nairobi Aquifer Suite from 2013 to 2020 are displaying long-term declining trends and minimal influence of short-term pumping schedule. Recharge based recovery are evident as observed during periods of heavy rains around April – June every year and as experienced in late 2019 and January 2020 as shown in the figure below generated from monthly monitoring data.





### *Permit application pattern against monthly rainfall (Nairobi sub-region) (Oiro et al., 2019)*

New borehole applications have trends of increasing during dry periods and dropping during heavy rains as indicated in the figure below. The trend also corresponds to drilling of new boreholes. Rainwater harvesting is therefore encouraged to ease pressure on groundwater during dry seasons.



Relationship between recorded monthly borehole permit applications and respective monthly average precipitation of Nairobi area, Kenya against time (months) are shown above.