General comments:

The authors used the Soil and Water Assessment Tool (SWAT) to simulate streamflow and water balance components for a forested catchment in Ghana. In addition, they use a future climate model to predict changes in streamflow and water balance components, which is the actual aim of the study. I have serious doubts, whether the paper can be published. My two major concerns are:

1. Measured streamflow data were not available. The authors used a very questionable method to derive streamflow. As a result, there is a very high uncertainty in streamflow data that were used for calibration. In general, the methodological approach is often unclear to me. There are many open questions. I will come back to that later in the specific comments. In general, the results are based on many vague and questionable assumptions.

2. The authors used only one climate change scenario, RCP8.5. This scenario is the worst case scenario and I wonder why other more moderate scenarios (RCP6.0, RCP4.5) were not taken into account.

Specific comments:

P1, Line 6: I believe, SUFI-2 was only used only for calibration and not for validation as well.

P2, Lines 34-35. This sentence can be deleted

P3, Figure 1: The resolution is too coarse to get all information of the figure. Catchment boundaries would be fine.

P4, line 17: Please, provide the SWAT version number.

P4, line 19-20: what is the grid cell resolution of the land use map?

P4, line 28: what is the grid cell resolution of the DEM?

P4, line 30: This is a small catchment for a SWAT analysis. Soil map has a coarse resolution, land use and DEM I do not know. However, I cannot understand why the authors set thresholds. They lose even more information. They ignore 20% of land use, for example. Please, explain.

P5, Fig 2: This map is unclear too me. There is a green dot representing the dam. The catchment outlet is downstream. That means discharge is completely controlled by dam regulations. The dam itself is approx. 2km from east to west. Am I right that large parts of the delineated catchment is actually open water from the reservoir? So, to avoid confusion and for clarification I suggest to provide different maps. 1. DEM with catchment boundaries, 2. Areal photo or topographic map with REAL river network and delineated catchment boundaries, 3. Land use across the catchment. The legend in the presented map shows DEM and land use but there is NO in formation in the map.

P5: Are meteorological data from the point in fig 1?

P6, l1: Are these data available in daily resolution? Are the local data consistent with the ARC2 data? A figure would be fine, showing prec coming from local and ARC2 data

P6, l3: Are these data available in daily resolution? Are the local data consistent with the ECMWF… data? A figure would be fine, showing temp coming from local and ECMWF data

P6, l6: Which statistical data do the authors mean?

P6, l7: What is the dewpoint temperature for? What about relative humidity?

P7, l1-l14: This is one of the most critical points in this paper. The authors calculated monthly climatic water balance (cwb) from precipitation and potential evapotranspiration. Next, they defined that 15% of monthly cwb is surface runoff. This is weird and calls for explanation! (Also, according to fig6 there is always flow. According to Fig 4, the annual cwb is negative (PET=1459, PREC=1266). That means that there are months with 0mm surface runoff and eventually 0mm total discharge, please explain.). To obtain streamflow, the authors multiply surface runoff with catchment area. Is this an accepted method? Are there references? Please, explain. In addition, the unit surface runoff in eq2 is mm/d. But it is unclear, monthly surface runoff data were converted into daily values. Also, what is the unit of A (basin area)?

P7,l18: There must be two model sets, for daily and for monthly calibration, right? But later on, I see only one parameter set.

P10Table4,5: Are these tables really necessary?

P11, l3: It is unclear to me, why the authors calibrated against daily and monthly streamflow data, and only monthly results are presented. Due to the uncertainty of "measured" streamflow, I would only calibrate at a monthly scale and delete all passages related to daily calibration.

P11, l13: 10 and 12 mm maximum rainfall per month? This is certainly much too low!!!

P12, fig7: maximum monthly rainfall approx. 18mm? This is certainly much too low!!!

P11,l20-21: I do not understand, why fitted parameters were inserted into a default model? "*This was to ensure that the new fitted ranges boosted the model performance for climate and stream-flow prediction.*" I cannot follow, why model performance for climate? Please, explain!

P12,l1: I am confused: There is Fig6 with optimized streamflow and there is fig9 with optimized streamflow data. Predicted streamflow in Fig9 is much higher. Why showing uncalibrated data…

P13,l5: Why did the authors only used RCP8.5 and not others?

Table7: The table captions are not explained. Is it important to show lateral flow? Groundwater flow is not show. Is the high percentage of surface runoff realistic? WYLD in future projection is more then three times larger. Is this realistic? The same for suface runoff….

Figure 10: I believe it is not a good idea to show future projections year by year. Nobody knows, how the wheather will be in 2040. But there are scenarios, how the climate will develop. Therefore, I suggest to compare a 30-years reference period (average) with the future projection (also 30 years, 2021-2050)