Response to the Comments on Feb 8th 2011

It is agreed that the use of the POT method is more suitable for trend detection than analysis of the annual maximum with the short period of data record. I acknowledge the assumption of independent and identically distributed data forces the use of runs declustering, while noting that POT methods have been justified in a setting with correlated and seasonal data. It would be interesting to see some β estimates for the case $r = 0$.

The approach we adopted here is more precisely known as the "point process approach", which operates very similarly to the POT approach, but uses a representation of the probability distribution that leads directly to the GEV parameters. Declustering with the runs algorithm seems to be standard practice and was also used by, for example, Mannshardt-Shamseldin et al. (2010).

When we ran the analysis with $r = 0$ and threshold $u = Q_{95\%}$ for each month, none of the β's is significant. With $r = 0$ and $u = Q_{90\%}$, beta values were found significant for February and July, with standardized beta values -2.04 and -2.47, respectively, which are very similar to the findings with $r = 1$. These analyses are not reported in the paper.

In the revision, we have clarified the methods (see paragraph 2, the Methods section) and point the readers to a recent work of Mannshardt-Shamseldin et al. (2010) (see paragraph 5, the Methods section).

The frequency of extreme values discarded due to runs declustering is substantial. For example, fully 11% of the June and 9% of September peaks over 95% threshold measurement (both in the main rainy season) are discarded. Is there any evidence data dicarded from runs declustering tend to occur more often early or late in the data record?

The frequency of extreme values discarded due to runs declustering is a result of temporal dependence. Even if there were no temporal dependence, 5% percent of the exceedences would be expected to be followed by another exceedance. These percentages higher than 5% confirms that there is temporal dependence and hence the declustering is necessary.

Figure 1 shows the time series of the number of discarded exceedances by months from 1953 to 2006. The largest count 7 near the beginning comes from January 1955, dry season, because the threshold (95% percentile) is very low due to many zeros for most dry days. There is no obvious pattern about the frequency of the discarded exceedances, especially in rain seasons.

A comment has been added in the revised manuscript; see paragraph 3, the Data section.

Page 8593: line 16, change "do" to "does".

Changed.

Page 8594, line 15 "for the models all 12 months"?

Changed to "for the models in all 12 months".

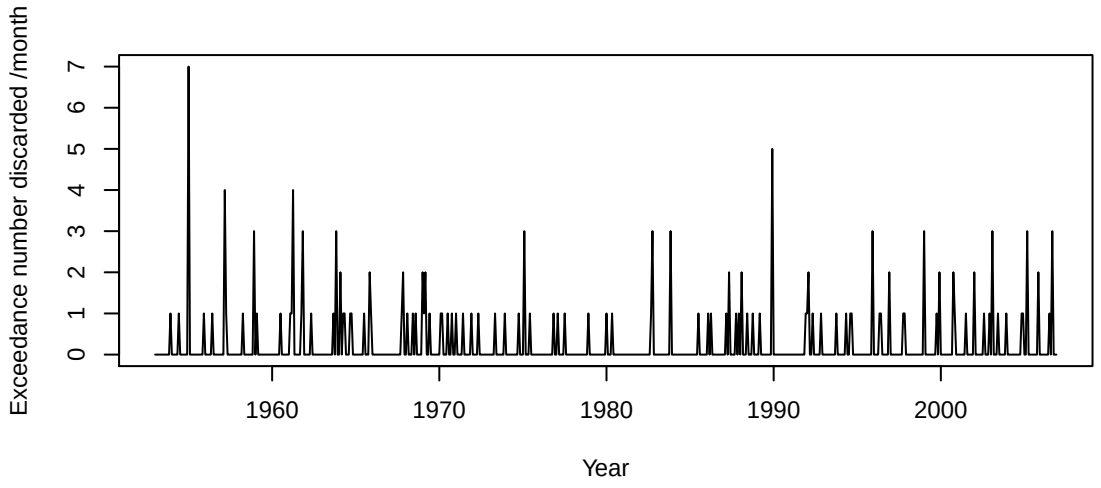

Figure 1: Time series of the number of discarded exceedances per month.

References

Mannshardt-Shamseldin, E. C., Smith, R. L., Sain, S. R., Mearns, L. O., and Cooley, D.: Downscaling Extremes: A Comparison of Extreme Value Distributions in Point-source and Gridded Precipitation Data, The Annals of Applied Statistics, 4, 484–502, 2010.