

## ***Interactive comment on “Detecting the influence of land use changes on Floods in the Meuse River Basin – the predictive power of a ninety-year rainfall-runoff relation” by A. G. Ashagrie et al.***

### **Anonymous Referee #2**

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Title: Detecting the influence of land use changes on Floods in the Meuse River Basin- The predictive power of a ninety-year rainfall-runoff relation

### General Comments

The paper presented is an interesting study on the possible importance of land use change with respect to the understanding of changes in the floods of the Meuse river. The paper is of interest to HESS and is especially of interest as it 1) discusses an important issue in the importance of long term land use changes with respect to flood generation, and 2) discusses the application of long term data ranges for runoff mod-

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eling. However the role of potential evapotranspiration in the modelling should be clarified more in detail

### Specific Comments

The main conclusion derived from modeling efforts is that land use change does not affect runoff in the Meuse basin within the errors of the available records. This is a new point of view as most studies so far suggested that land use change, apart from climate change, is the most important factor altering runoff generation. Another conclusion mentions the changes in land use that occurred, but these data are not really given or discussed in the text. A table showing these changes would be of interest.

There are some further remarks to be made on the conclusions:

One first remark is that the data set used and modeling as well, applied the use of potential evaporation values following the Penman equation. Potential evaporation is based on the assumption that no water shortages occur. However, it is well known that especially in summer, water shortages occur which will affect the evapotranspiration rates. Whether the authors have incorporated this, is not mentioned, clarified or discussed in the paper. How this might affect modeling outcomes is also not addressed.

A further remark has to be made on the calibration and validation of the model. This has been done for the best data set from 1968-1998. Input data (P,T, PE) of the model have further been extrapolated to the period prior to 1968, using multi-regression techniques. No information is given on the accuracy of this approach although possible effects on the model outcomes for the period prior to 1968 are given in table 2.

Especially the uncertainty on the Potential Evapotranspiration are an important point of discussion (see fig 3) and are the key factor in the modeling. The paper would certainly improve when this point is addressed in more detail, especially as the main conclusions are directly related to the effect of land use.

### Technical comments

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Prior work is sufficiently referred to. One essential paper is possibly hard to get hold of: van Deursen (2004); as it is a report and in Dutch, but important as it is explaining model calibration of the applied HBV model. The paper of Maugeri et al. 2002 is not referred to in the text, but listed in the references. Figure 1 is too small to be read.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 3, 529, 2006.

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3, S356–S358, 2006

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