**Supplementary information**

**A.1. The conversion of NDVI to**

A preliminary () was calculated from the corrected NDVI () by rescaling the NDVI using maximum and minimum thresholds (Roderick et al., 1999; Donohue et al., 2008).

(A-1)

where and are the maximum and minimum possible values which were set to 0.95 and 0.0, respectively. and are the corresponding maximum and minimum NDVI thresholds which were set to 0.80 and 0.05, respectively.

**A.2. The calculation formula of the climate seasonality index (*S*)**

The climate seasonality index (*S*), proposed by Milly (1994) and Woods (2003), can be calculated as:

(A-2)

(A-3)

(A-4)

where and are the ratios of the amplitudes of the monthly harmonics to the monthly averages of precipitation () and potential evapotranspiration (), respectively. is the cycle of seasonality, which is 0.5 (6 months) in the tropics and 1 (12 months) outside the tropics. is the time in months. is the dryness index ().

**A.3. The calculation of the ratio of precipitation in the form of snow to total precipitation ()**

for each sub-catchment in this study was calculated following Berghuijs et al. (2014). Precipitation on days with a mean temperature below 1 was considered to be entirely snowfall, while it was considered to be rainfall on days with temperatures above 1 .

**A.4. The calculation of the ratio of engineering measure area to the total catchment area ()**

The engineering measures include terraces and check-dams in this study. However, the capacity of runoff interception by them is different (Zhang et al., 1994; Shi et al., 2013; 700.5 m3/ha and 4500 m3/ha for terraces and check-dams, respectively). In order to unify the area of terraces and check-dams, we assumed a weight of 1 for check-dams and 700.5/4500 for terraces. Then, we multiplied the area of terraces by 700.5/4500 to convert into an area equivalent to that of check-dams in the sense of runoff interception capacity. is the total weighted area of the terraces and check-dams divided by the gross catchment area.

**A.5. The calculation formula of the sensitivity coefficients of runoff to changes in , and**

Based on the definition of the elasticities of runoff to , and (Schaake, 1990; Xu et al., 2014), they are given as:

(A-5)

(A-6)

(A-7)

where all the symbols have the same meaning as depicted above.

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