

BACKGROUNDS

Climate change is at the root of several natural disasters (floods, drought, desertification.) around the world (Fossou et al., 2015). These events have a negative impact on agriculture, livestock and natural resources (Karimou Barké et al., 2015), which are sectors on which the bulk of West African national economies are based. This is the case of Côte d'Ivoire and more particularly the Lobo watershed, whose economic development is based on agriculture, which is of the rainfed type and therefore very sensitive to the climatic context. Climatic variations lead to the shifting of seasons (delay in the onset of rains, pockets of drought within the rainy seasons, disruption of the farming calendar). There is a regular and effective drop of half of the production or yield of rainfed agriculture. Knowledge of climatic extremes is important for daily life and plays an essential role in sustainable socio-economic development and emergency management. This study therefore proposes to study the trend in extreme rainfall indices in the Lobo watershed (figure 1).

DATA AND METHODOLOGY

The data used are daily precipitation data from seventeen stations over the period 1984 to 2013 (30 years), available at <https://globalweather.tamu.edu/#pubs>. They were processed using the ClimPACT2 programme, which enabled the calculation of these indices

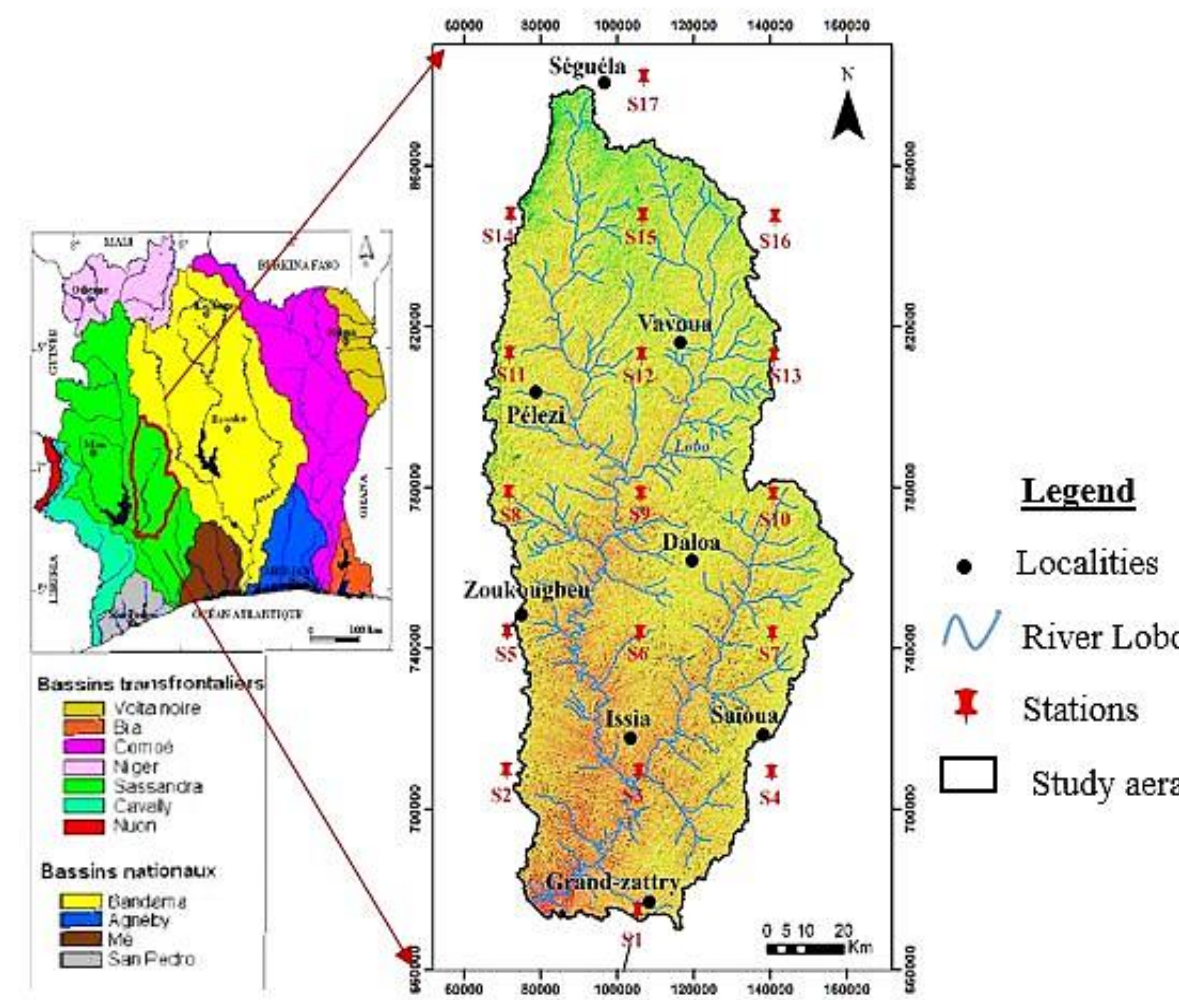


Figure 1: Situation of area study

The climate index method proposed by the Expert Team on Climate Change Detection and Indices (ETCCDI) was adopted in this study.

RESULTS AND DISCUSSION

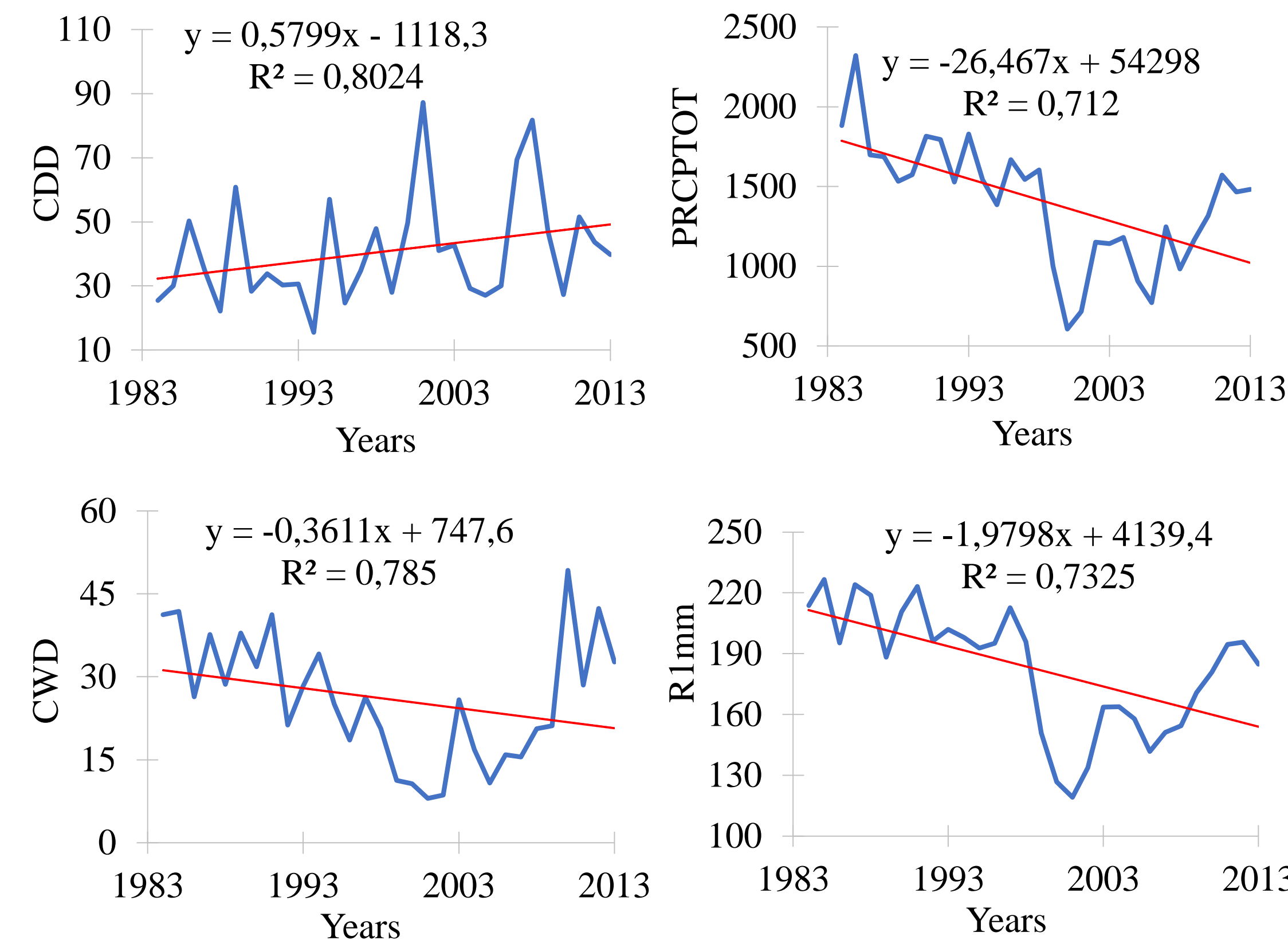


Figure 2: Annual variation and linear trend of CWD, R1mm and PRCPTOT indices in the northern half of the Lobo watershed

Figure 2 shows that the northern half of the Lobo watershed experienced an increase of 0.58 d/yr of CDD and a decrease of 0.36 d/yr of CWD, 1.98 d/yr of R1mm and 26.467 mm/yr of PRCPTOT

Figure 3 shows that the extreme south of the Lobo watershed experienced a decrease of 0.32 d/year of CWD, 1.6 d/year of R1mm and 20.58 mm/year of PRCPTOT except CDD which is up by 0.29 d/year of CDD

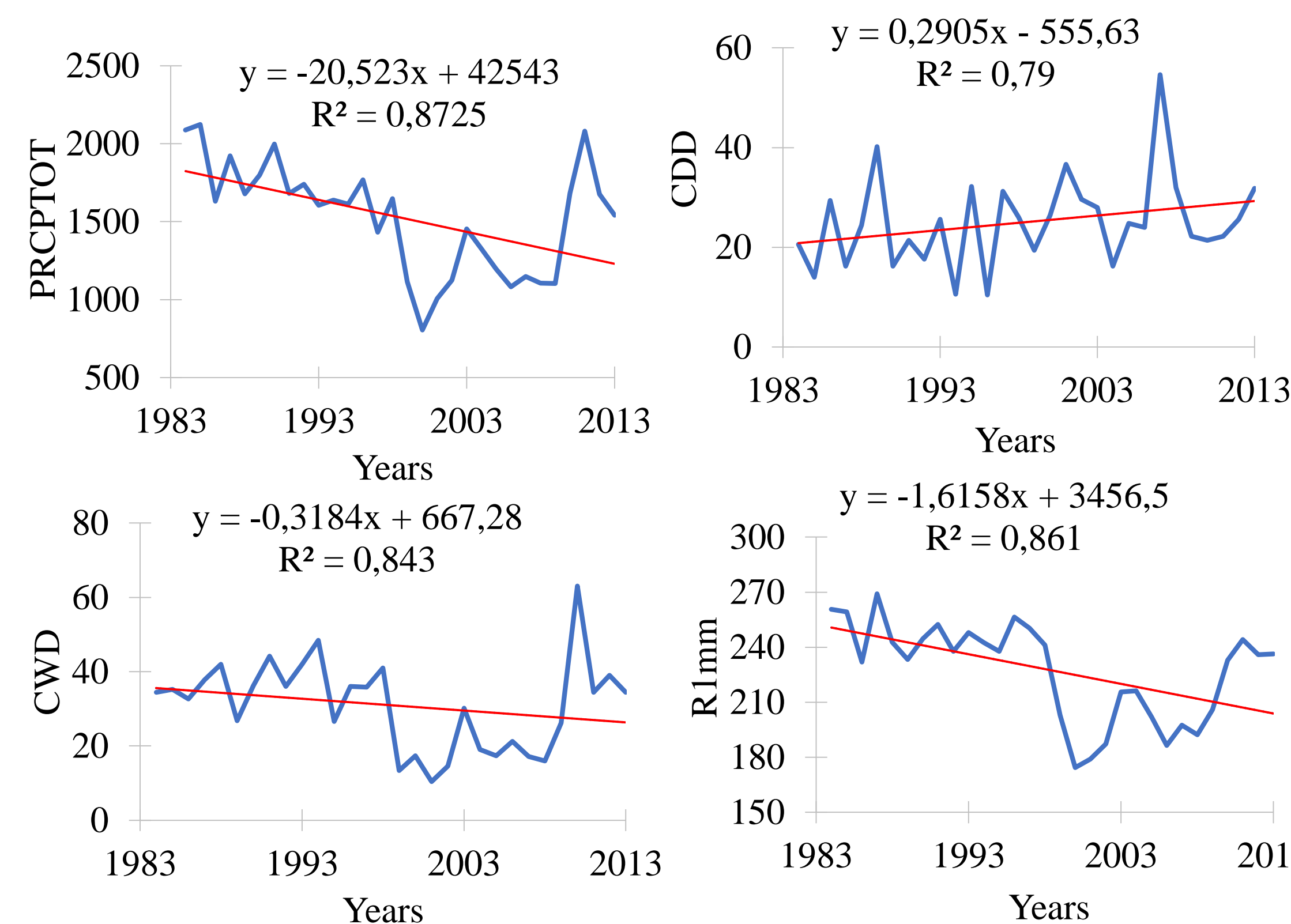


Figure 3 : Annual variation and linear trend of CDD, CWD, R1mm and PRCPTOT indices in the extreme Lobo watershed

The study showed an upward trend in consecutive dry days (CDD) in the northern half and the extreme south of the watershed during the study period. These results are similar to the work of Ozer et al (2017) in Niger and Balliet et al (2016) in the Goh region. In the northern half of the watershed, a decrease in consecutive wet days (CWD), rainy days (R1mm) and total annual rainfall (PRCPTOT) was also indicated in the northern half of the watershed. As for the extreme south, it also experienced a downward trend in CWD, R1mm and PRCPTOT. The work of Attogouinon et al (2017) in the upper valley of the Ouémé River in Benin also showed a decrease in the CWD index. The decrease in the number of rainy days recorded in this study is also observed in the work of Athar (2013) in Arabia during the period from 1979 to 2008. Taibi et al (2015) confirm the decrease in the PRCPTOT index.

CONCLUSION AND PERSPECTIVES

The study analyses trends in extreme rainfall indices in the Lobo watershed (central-western Côte d'Ivoire). Thus, the analysis shows a general decrease in CWD, R1mm and PRCPTOT with the exception of CWD which is increasing over the whole study area. These different observed trends predispose the region to drought and may have a negative impact on agricultural production, as crops in this region are highly dependent on rainfall, especially in terms of frequency, distribution and duration.

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