To calculate aboveground biomass we adopted the equation proposed by Chave et al. [51], considered as the best fit equation for data for forest formations in the tropical region and used the BIOMASS package [52] in software R [53].

AGB= aboveground green biomass (kg), WD= woody density (g.cm-3), H= tree height (m), DBH= diameter measured at 1.3 m aboveground (cm).

To determine the changes in density of tree within the woody community assembly, we used the equation of Sheil et al. [54], which considers the mortality rate based on the initial number of trees, and the recruitment rate based on the final number of trees. As the time interval between measurements was not constant, we applied the correction factor proposed by Lewis et al. [55] (). This corrected small biases caused by the influence of differing census intervals and allowed us to estimate the dynamics of the woody community assembly. We thus calculated the mean annual rates of mortality (M), and recruitment (R):

Where *t* = time between monitoring; N0 = initial number of individuals; Nm = dead number of individuals; Nr = number of recruits; Nt = final number of trees; and = corrected rate of mortality or recruitment, as suggested by Lewis et al. [55].

We referred to the sequential intervals between the measurements as I1 (1996 - 1999), I2 (1999 - 2003), I3 (2003 - 2006), I4 (2006 - 2010) and I5 (2010 - 2016). We classified the tree trunks into three categories: A) small (between 5 and 10 cm DBH), B) medium (between 10 and 35 cm DBH), and C) large (greater than 35cm DBH) [56]. We used these categories to arrive at a better understanding of the changes in the structure of the woody community assembly.

We calculated the productivity in aboveground biomass (PB) by summing the aboveground biomass of recruiting individuals, and the growth of the surviving trees, relative to time [14] where: Bi = Where: Bi= biomass of recruits tree, Bj= subsequent monitoring biomass for tree; Bj-1= previous monitoring biomass for tree. We measured net biomass change (NBC) between each interval as the difference between the later and the previous biomass totals, where: Bn= total biomass subsequent monitoring biomass; Bm= total biomass previous monitoring.

To evaluate the effect of forest fire time and occurrence of the aboveground biomass (AGB) and number of stems (NS) variables, we used the Generalized Estimating Equation (GEE) [57,58], with the log binding function and the Gamma distribution for AGB, and Poisson for NS. This method of adjustment has an advantage, as it evaluates the temporal autocorrelation that incorporates the correlation structure between observations within the plots [58]. To evaluate the relationship between the predictor variables (AGB, NS, M) and dependent variables (time and forest fire), we performed the modified Wald chi-test [59]. When effects of time, forest fire or interaction between these were apparent a Bonferroni post-hoc test was used to assess significance [60]. We performed the analysis using SPSS version 24 [61], and adopted α <0.05 as the significance level for all analyses.