The objective of the project will be the optimization of a commune, given that we have an indicator of segregation (Duncan Dissimilarity Index):

$$S = \frac{1}{2} \sum_j \left| \frac{v_j}{V} - \frac{nv_j}{NV} \right|$$

where v_j (correspondingly nv_j) is the number of "vulnerable" (correspondingly "non-vulnerable") students that study at school j and V (correspondigly NV) is number of "vulnerable" (correspondingly "non-vulnerable) students in the commune.

We can define a binary decision variable:

$$x_{i,j,k} = \begin{cases} 1, & \text{if student } i \text{ studies at school } j \text{ and belongs to class } k \\ 0, & \text{in any other case} \end{cases}$$

where $i = 1, 2, \ldots, n$, and $k \in \{0, 1\}$ indicates if the student is "vulnerable" or not.

I believe that segregation should be one of two criteria for assignment of students to schools. Distance to a school should be included in the objective function, as it will do no good to displace students too far away from their schools. Thus, the objective function should have the following form:

$$\text{Minimize } Z = \beta_1 S + \beta_2 \sum_i \sum_j \sum_k d\left(x_{i,j,k}\right) \cdot x_{i,j,k}$$

where $d\left(x_{i,j,k}\right)$ is the distance from the residence of student i to school j, and $\{\beta_1, \beta_2\}$ are constants that weight the importance of each criteria.