Seed dispersal in a changing world

Seed dispersal is one of the most important life history strategies of plants. Particularly in tropical forests, more than 70% of plants are dispersed by animals, who eat their fruits. Plants and their animal seed dispersers often act mutualistically. While animals derive nutritional benefits from the fruits and seeds of plants, they help these plants to disperse to escape competition and predation at their natal sites or find more suitable habitats. Seed dispersal will necessarily have three actors and operate through three stages. Plants (actor 1) are the source of seeds from where the seeds are leave (stage 1) and carried away (stage 2) by seed dispersers (actor 2) through a landscape to deposit them at sites (actor and stage 3).

1. Can you set up a scenario with multiple seed sources, dispersers and sites. What rules with govern in this environment and its boundaries.
   1. Can the contacts between seed sources and dispersers be frequency or density dependent? For instance, higher the number of sources, more is the contact. Else, a fixed number of contacts between them and dependent of proportion of fruit bearing trees.
   2. Likewise, can the dispersers increase seed spread to suitable sites in a density dependent manner of sites or have fixed ranges where proportion of suitable sites would matter.

Seed dispersal can determine how plant communities are assembled and maintained at multiple scales. While expectedly, at a small scale, dispersal can introduce heterogeneity to plant communities, at larger scale, its effects may be limited.

1. What traits are characteristics of seed dispersal. Are there traits specifically meant for long dispersal? How correlated is dispersal with other strategies?
2. Does dispersal follow a gradient of energy?

Population consequences of dispersal are well studied. It can maintain positive growth rate of a population by introducing new individuals. Dispersal can also cause spread of population to newer areas.

1. How does dispersal affect birth and death rate? Can it shift the point where the curves intersect?

At the community level, dispersal can interact with competition and facilitation within trophic level. Whereas, across trophic levels, it can also influence herbivory, frugivory or seed predation.

1. What role dispersal has to play in competition? Can it lead to exclusion or coexistence?

Therefore, dispersal impacts can have ecosystem consequences. Studies have shown how carbon sequestration by trees are mediated through seed dispersal. Other possible impacts could be on soil fertility, water tables etc.

1. Can dispersal cause a carbon flux? What path does it follow?

However, plant dispersal is threatened by anthropogenic factors, particularly by hunting and habitat degradation.

1. How all the above processes and patterns are impacted by human actions?