

## Assessing the scope for pollinator-friendly agriculture in the peri-urban landscape of Bangalore, India

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1) The reconnaissance survey have been completed and the actual sites (farmlands) have been identified for performing the study.

2) The predominant commercial crop grown in the Anekal taluk of Bangalore Urban district, Chayote squash (*Sechium edule*) (**pic: 1**), has been selected as the study species. This crop is grown across the entire landscape in more than sixty farmlands in a staggered fashion throughout the year. As majority of the crop species grown in this region are from the Cucurbitaceae family, so this particular species can be treated as a representative crop of the region belonging to the same family.



Picture 1: Study species-Chayote squash (Sechium edule) after harvest

3) The morphology of the flowers (**pic: 2 and pic: 3**) have been analyzed and it appears to be a highly pollinator dependent crop (probably bee pollinated). Further analysis is being done in consultation with a plant taxonomist.





Picture 2: Male flower of the Chayote Squash

Picture 3: Female flower of the Chayote Squash

4) Initially, in the project, both home gardens and farmland selection was proposed, to have a comparative idea about the management practices. During the reconnaissance survey it was found that pesticide usage is a common practice even for the home gardens. This forced us to modify the project, as comparing home gardens and farmlands probably will not yield significantly different results. However, there seems to be variance in pesticide usage across farmlands. This data has been incorporated in our study design and might provide a clear picture of the effect these inorganic pesticides have on pollinator number and diversity.

5) Four types of pollination treatments (self, cross, positive control, negative control) were performed across two hundred flowers in total. Fifty random flowers were selected

and bagged at the bud stage for each treatment (**pic: 4**). All the hand pollination experiments along with control experiments have been conducted in a farmland at its peak bloom. The data collected from the breeding experiments are currently being analyzed to understand the pollination ecology of the species.





Picture 4: Flowers bagged after pollination treatments and kept till the petals fall off

6) The standardization of the pollinator visitation observations have been completed using three sites over nine days (3days in each site) to select the ideal duration of observation sessions (**fig: 1**).





7) Observations on the pollinator visits have been started. But owing to the staggered nature of farming practices in this region the desired sample size is yet to be attained. Moreover, this year due to reduced frequency of pre-monsoon showers and unusual high temperature (around 38°C) there is growth suppression in this species and also there appears to be a low floral output (**pic: 5**). These factors together are causing a hindrance to the field work.



Picture 5: Current condition of the farmlands due to excessive heat and less rainfall

8) Pollen tube growth analysis of various pollination treatments have been initiated in the laboratory using hand pollinated flowers collected from farmlands. Protocol standardization is currently under progress for this particular species.

9) Pollinator identification using photographs (**pic: 6**) and samples collected from farmlands at the genus level have been partially completed.



Picture 6: Variety of bee species visiting Chayote Squash flowers

10) Secondary crop data on the production, total area and crop pattern for the last two decades have been collected from the Directorate of Economics and Statistics office, Bangalore. This data is mostly available in local language hence it has been translated to English. The data has been computerized and its analysis has been initiated.

11) Ground-truthing points for all the sites growing this particular species of crop have been collected from the field visits.

12) Due to the staggered nature of the cropping pattern, all the farmlands to be worked upon is yet to be finalized. Only the selected farmlands have been incorporated in the spatial map.

Due to the abovementioned issues, I feel it is unlikely that all the data for the proposed project will be collected and analyzed by June, 2014. Thus, I hereby request the Rufford Foundation to consider the natural field problems and kindly extend the funding period to December 2014 so that I can fulfill my goals.