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## Declining Bee Populations in Central California

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## INTERVENTION 1 IMPROVING THE EFFECTIVENESS OF GOVERNMENTAL POLICIES & ACTION As designers, our responsability is to improve existing public policies towards beekeepers and pollinator habitats, while implementing new strategies based on leverage points 5 and 12 to encourage bitpartisan cooperation between local, state, and federal governments as well **URBAN DEVELOPMENT** INTERVENTION 2 TECHNOLOGICAL IMPROVEMENTS TO THE POLLINATOR PROCESS pekistan and "Integrat **INDUSTRIAL FARMING** By changing the goal of the system (leverage point 3) from protecting and preserving prexisting methods of pollination or pollinators, designers and researchers can use their capabilities to create new methods of pollination. NON-NATIVE SPECIES PATHOGENS & eventually replace pollinators in farms reducing the reliance of agriculture on pollinator populations. PARASITES collect and analyze data. Sound placed around bee hives to CLIMATE CHANGE advocacy groups also discourage gene editing being used in agriculture. Studies have shown it is possible to breed new honey bees that are resilient to bathogens and parasites that were previously lethal towards them. DIMINISHING FOOD **CROP YIELDS** STATE GOVERNMENTAL GOVERNMENTAL POLICIES ECONOMIC DEPENDENCE JOB LOSS (BEEKEEPERS) NON-PROFIT RESEARCH **ORGANIZATIONS** CULTURAL IMPRESSIONS ENVIRONMENTAL **EFFECTS** CULTURAL ETHNOBOTANY INTERVENTION 3 INCREASING SOCIAL AWARENESS AND ACTIVISM DECREASED BIODIVERSITY Work Cited: tinyurl.com/systems-pollinators

Process Boards: https://miro.com/app/board/o9J\_IMbcV8s=/ (miro)

tinyurl.com/pollinators-figma (figma)

# DECLINING BEE POPULATIONS IN CENTRAL CALIFORNIA

ANTHONY PAN, SPOORTHI CHERIVIRALA, TARA BANATWALA, JASON LIN

### WHAT?

The pollinator population has been on a steep decline since the early 2000s, with beekeepers reporting an average loss of 30 percent of all honeybee colonies each winter. Specifically in California, around 270,000 colonies were lost between 2015 and 2017; this was 70,000 more than those lost nationwide. Bee population in the winter is expected to decline, normally averaging around 17% loss in population; however, that percentage has more than doubled in recent years.

### <u>\_SO'</u>

With almonds being the state's largest overseas export, California needs 1.6 million domesticated bee colonies to upkeep and pollinate 800,000 acres of the flowering trees. This doesn't include the number of bees needed to pollinate other staple crops like apples, avocados, and grapes. After mid-march, the bees that were being used to pollinate the almonds are then shipped around the US for other pollination services. Declining bee populations will leave these crops unpollinated, leaving farmers cropless, beekeepers jobless, and consumers hungry. Moreover, local environments will suffer from diseases due to a lack of genetic diversity and pollination among plants; many animals and insects that prey on bees lose out on an important food source.

### WHY?

We chose to study central California specifically because of the staggering colony losses, losing more bee colonies than the rest of the United States combined. With California being one of the world's agricultural giants, producing \$7.34 billion in milk, \$6.09 billion in almonds, and \$5.41 billion in grapes. Declining pollinator populations would thus have a disproportionate impact not only on California, but on the rest of the United States with one of California's largest industries taking a hit. California's liberal legislation allows for our group to study the current solutions and interventions applied to this complicated web of interactions.

