D4N 2025

Delivering for Nutrition in South Asia

Towards Impact at Scale

Scaling Pollinator Stewardship: Pathway to Improve Nutrition, Livelihoods, and Biodiversity

Evidence from Nepal

Sujan Sapkota
Research, Development and Innovation
HERD International

Authors: Sujan Sapkota, Tom Timberlake, Naomi M. Saville, Kedar Devkota, Sushil Baral, Jane Memmott

Presentation Outline

- ❑ Background
- ❑ Rationale
- ❑ Key Questions
- ❑ Methods/ Analysis
- ❑ Results/ Findings
- ❑ Implications for Scaling and Policy
- ❑ Next steps
- ❑ Nepal Pollination Project

Background

❑Smallholder Dominance and Vulnerability

- Most of the farms are smallholdings
- Highly dependent on local agroecosystem services
- Extremely vulnerable to climate change and environmental degradation

❑Food Insecurity and Malnutrition

- Nearly half of the households face severe food insecurity
- Average micronutrient adequacy is only 37%
- Under-five (stunting 51.8%, underweight 24.6%, wasting 5.4%), as well as adolescent girls (stunted: 37%; adults underweight: 44.6%) malnutrition is high
- Key nutrient deficiencies: Vitamin A, B2, B12, Calcium, Iron

How will the pollinator population change impact nutrition, livelihood and biodiversity?

Background

❑Pollinator dependence, decline and impact

- 3/4 of crop species depend on pollinators
- Wild pollinators and honeybees are declining in the region
- Crop and wild flowering plants are crucial for forage availability and survival of pollinators
- Insect-pollinated fruits & vegetables are consumed only seasonally
- Without pollinators, there will be 44% decline in household income, 23% reduction in Vitamin A intake

❑Opportunities and solutions

- Pollination is a key agricultural input that must be managed and valued like other inputs
- Pollination is free and accessible with very limited incomes
- Enhancing pollination services can increase household income by 15%, including other micronutrient intake

How to address the problem?

Pollinators are declining and can be reversed
If farmers, researchers, extension workers, and policymakers work together

Darwin Pollination Project (Jun 2022 - Dec 2024)
Embedding Sustainable Pollination Management into Nepalese Agricultural Systems

- Pollinator Awareness and Stewardship Program
- Pollinator Capacity-Building Program
- Provincial Pollinator Strategy for Karnali province

Pollinator Awareness and Stewardship Program

Awareness Classes

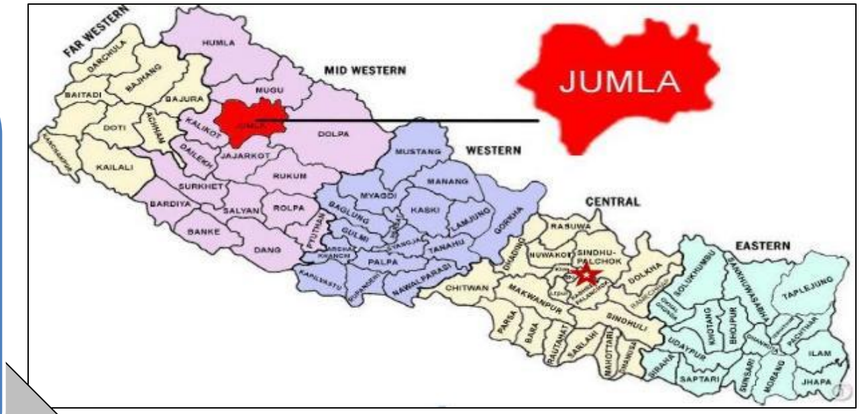
Deliver pollinator conservation and apple orchard management classes to communities

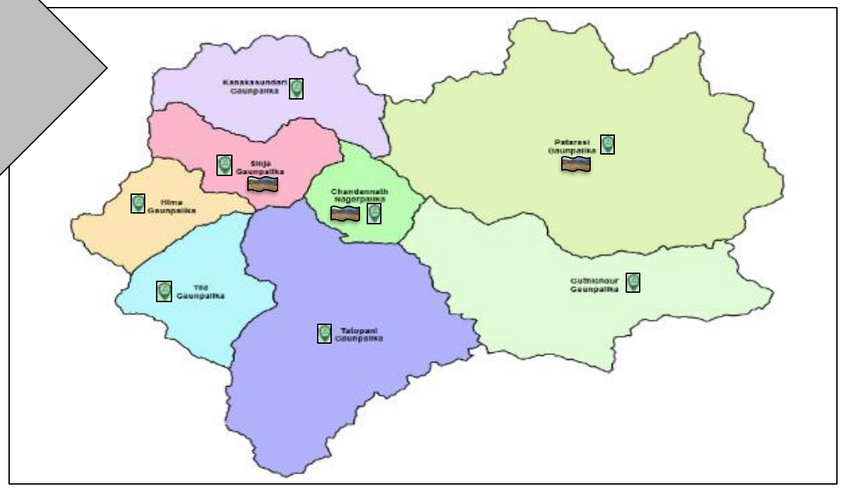
Demonstration Farm

Establish pollinator-friendly demo farms to show the benefits of good pollination management

Farmer Field School (FFS)

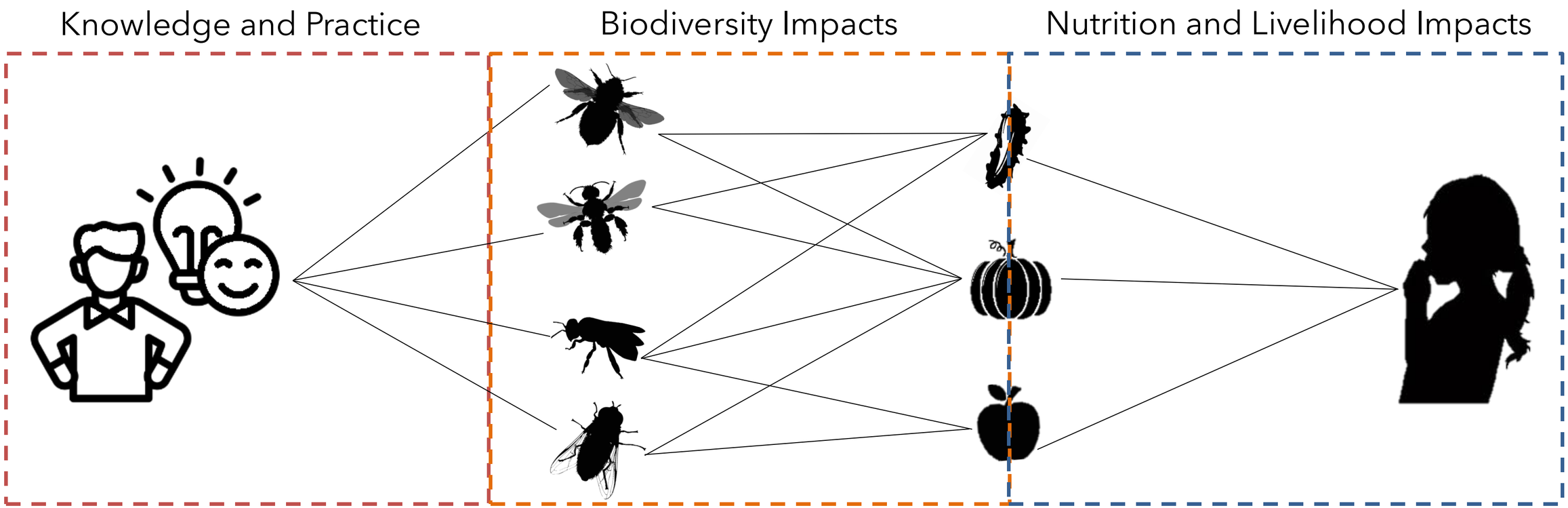
24 skill-based sessions on climate-resilient, pollinator-friendly agroecological farming and nutrition promotion





	Community Awareness Activity
	Demonstration Farms and Stewardship Program

Key Questions?



Does community-based education improve knowledge and adoption of pollinator-friendly farming?

Do pollinator-friendly practices boost pollinators and plant density/ diversity?

Does adopting pollinator-friendly practices improve crop yield, diet, and income?

What drives or limits uptake of pollinator-friendly practices, and how the model can be scaled nationally?

Methods/ Analysis

Baseline and Follow-up Surveys

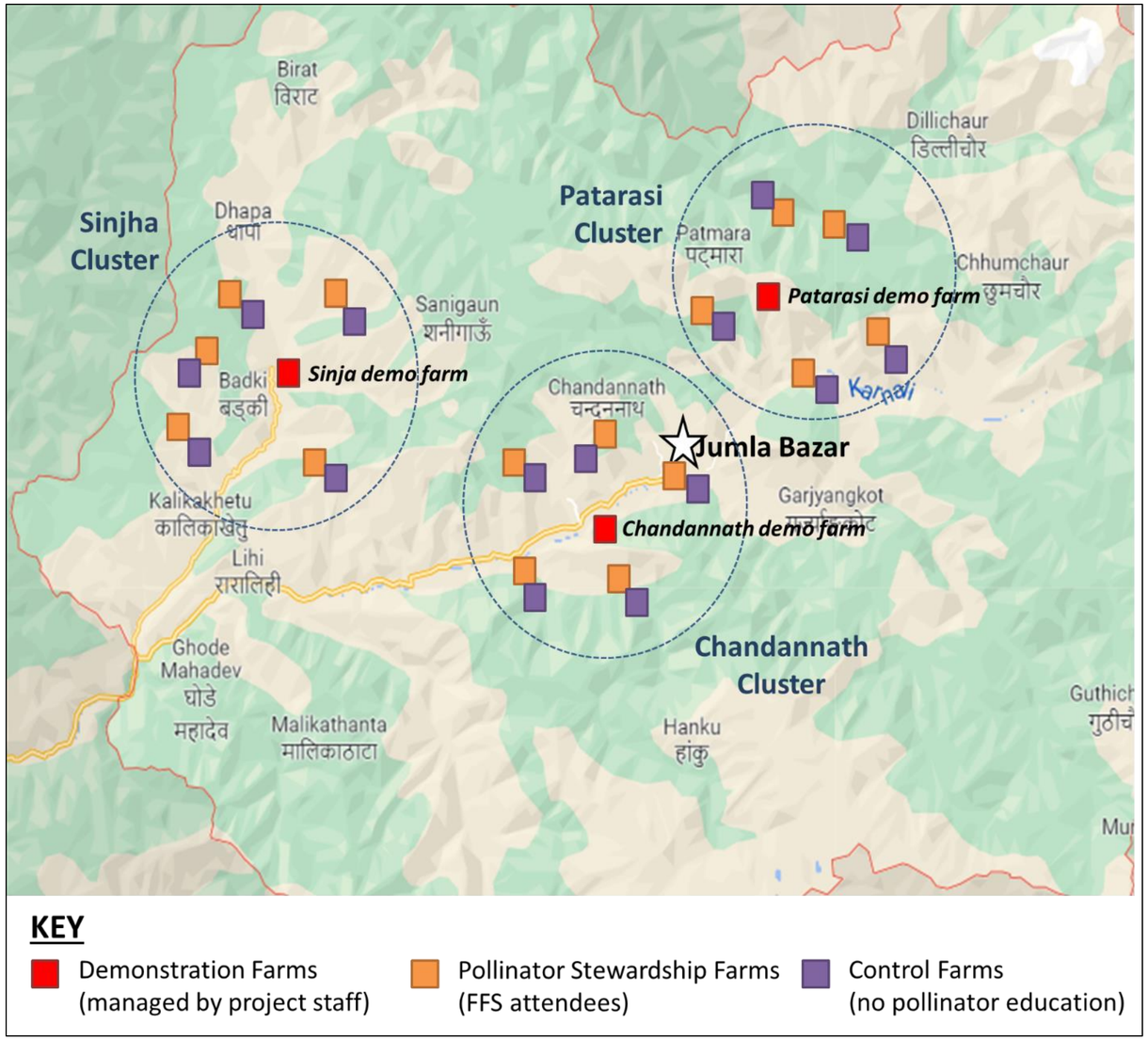
Do pollinator awareness and stewardship programs boost adoption and improve yield, diet, income?

Involved Program	Baseline Survey Participants	Follow-up Survey Participants
Awareness classes	1390	821 (60% of randomly selected baseline participants in follow-up)
Farmer Field School (FFS) Sessions	180	180 (100% of baseline participants in follow-up)

Plant and Pollinator Monitoring Surveys

Do pollinator-friendly practices boost pollinators and plant density/ diversity?

Participating Farms	Details	Farm No.	Survey Focal Crops
Demonstration Farms	Model farm managed by project staff	3	Apple, Mustard, Bean
Pollinator Stewardship Farms	Managed by FFS participants	15	Apple, Mustard, Bean
Control Farms	No intervention	15	Apple, Mustard, Bean



Plant and Pollinator Monitoring Surveys

Recorded ecological and agricultural parameters from each site (demo, stewardship and control) for three focal crops (apple, mustard and bean) with surveys repeated three times per year.

Pollinator Density

x3 scan sampling using click counter

Pollinator Diversity

x3 pan trapping using fluorescent pan traps

Crop Yield

Crop seed/fruit set and quality measures

Plant Diversity

x3 flowering plant surveys using plant transect

Wild Plant Pollination

Plant reproduction recorded using wild plant seed set

Results/ Findings

Program and Survey Participants

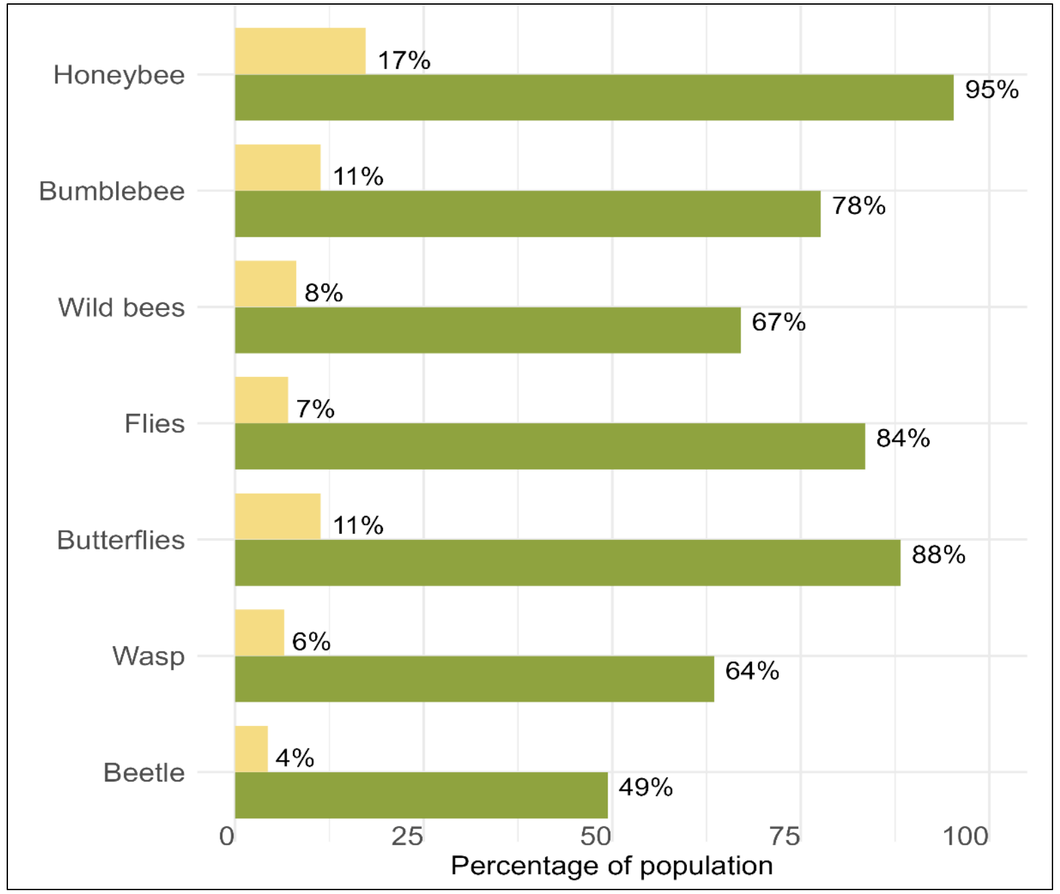
Baseline awareness: Less than 1 in 5 farmers knew what pollination was

Activity Type	Total events	Total participants	% female	% male	% children
Awareness Classes	661	20470	66%	34%	15%
Farmer Field Schools	131	180	83%	17%	0%

Involved Program	Baseline Survey Participants	Follow-up Survey Participants
Awareness classes	1390	821 (60% of randomly selected baseline participants in follow-up)
Farmer Field School (FFS) Sessions	180	180 (100% of baseline participants in follow-up)

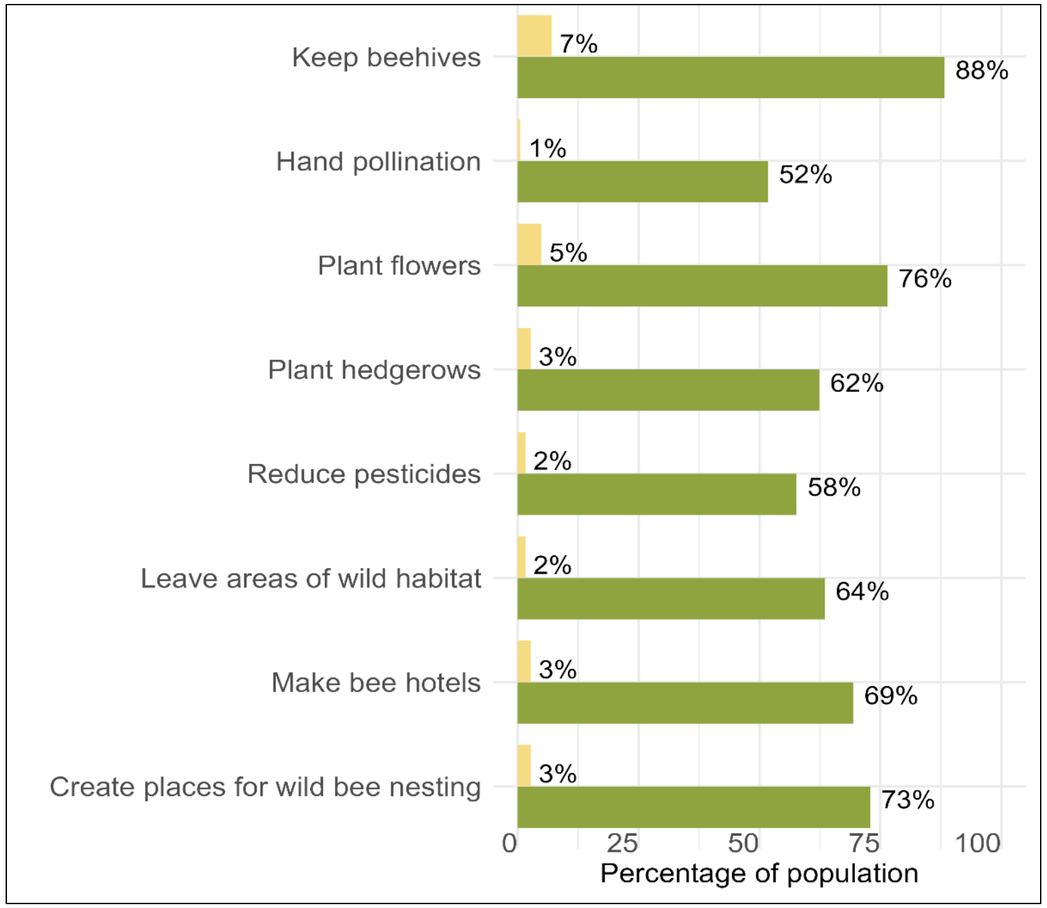
Pollinator Awareness and Actions

Question: Which insects can you list that pollinate your crops?



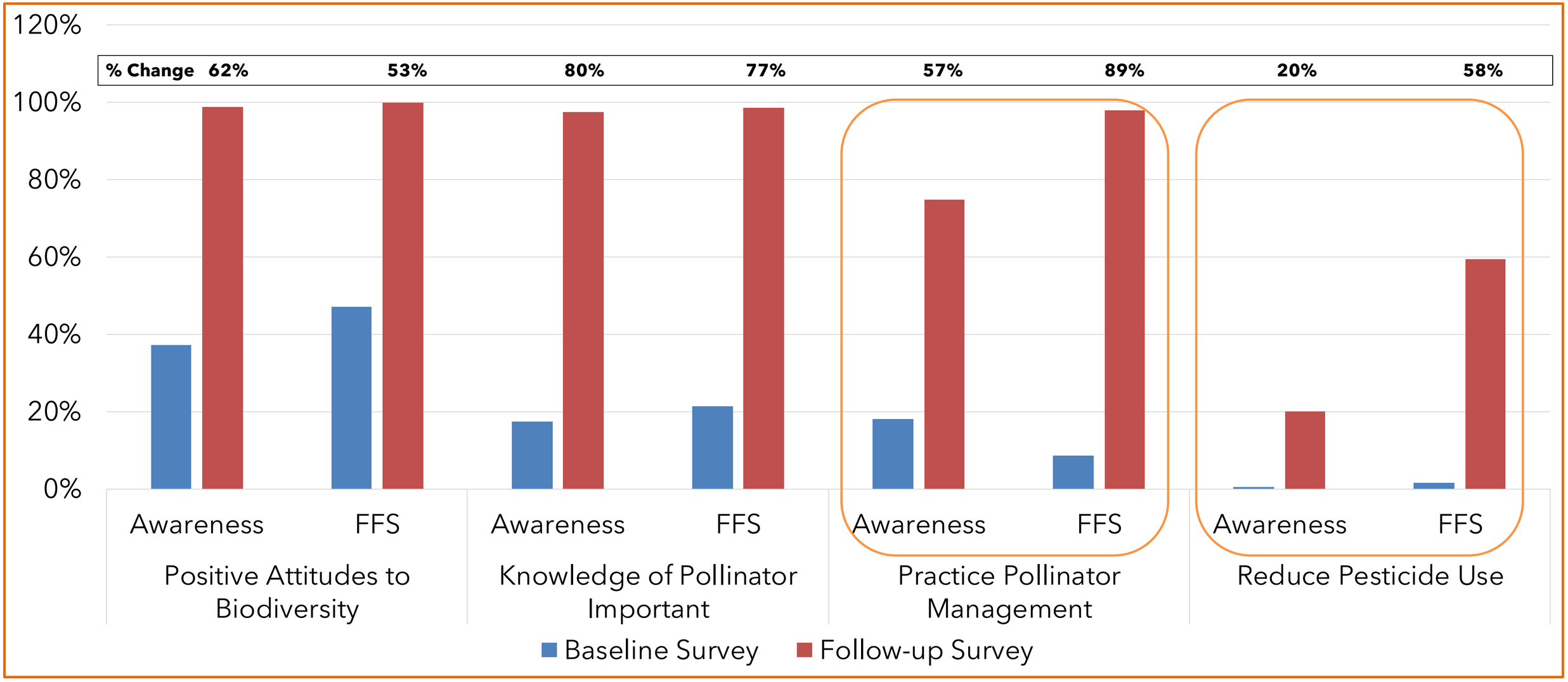
AWARENESS → ACTION

Question: Which actions do you take to improve crop pollination?



KEY — Before project activities — After project activities

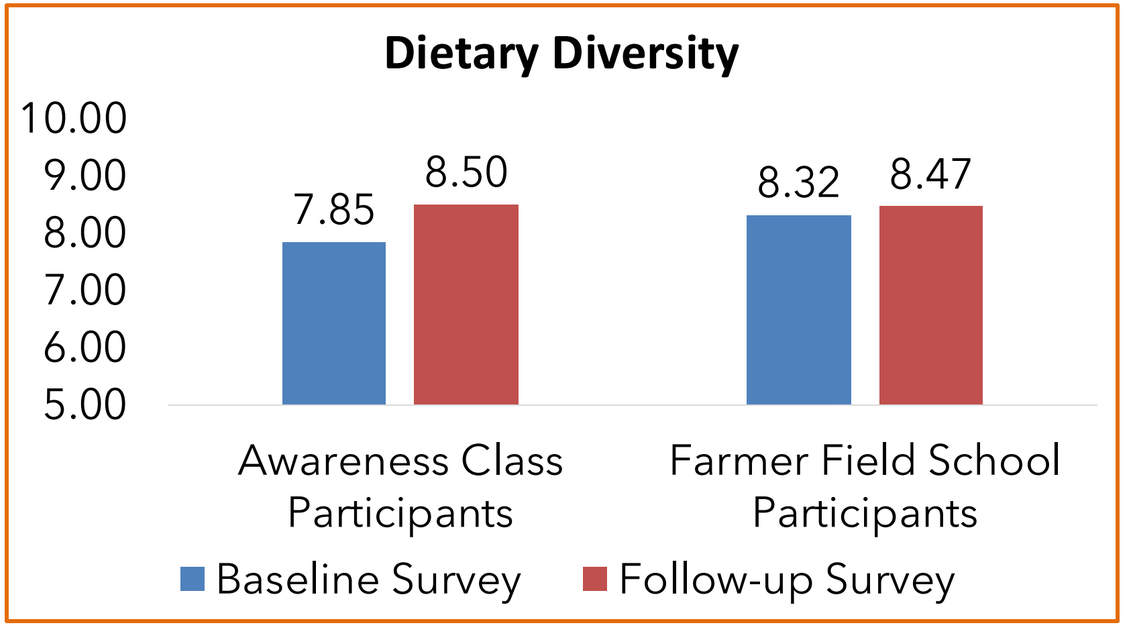
Awareness and Practice of Pollination Management



Agriculture and Nutrition Impacts

Compared with the control, FFS farmers had:

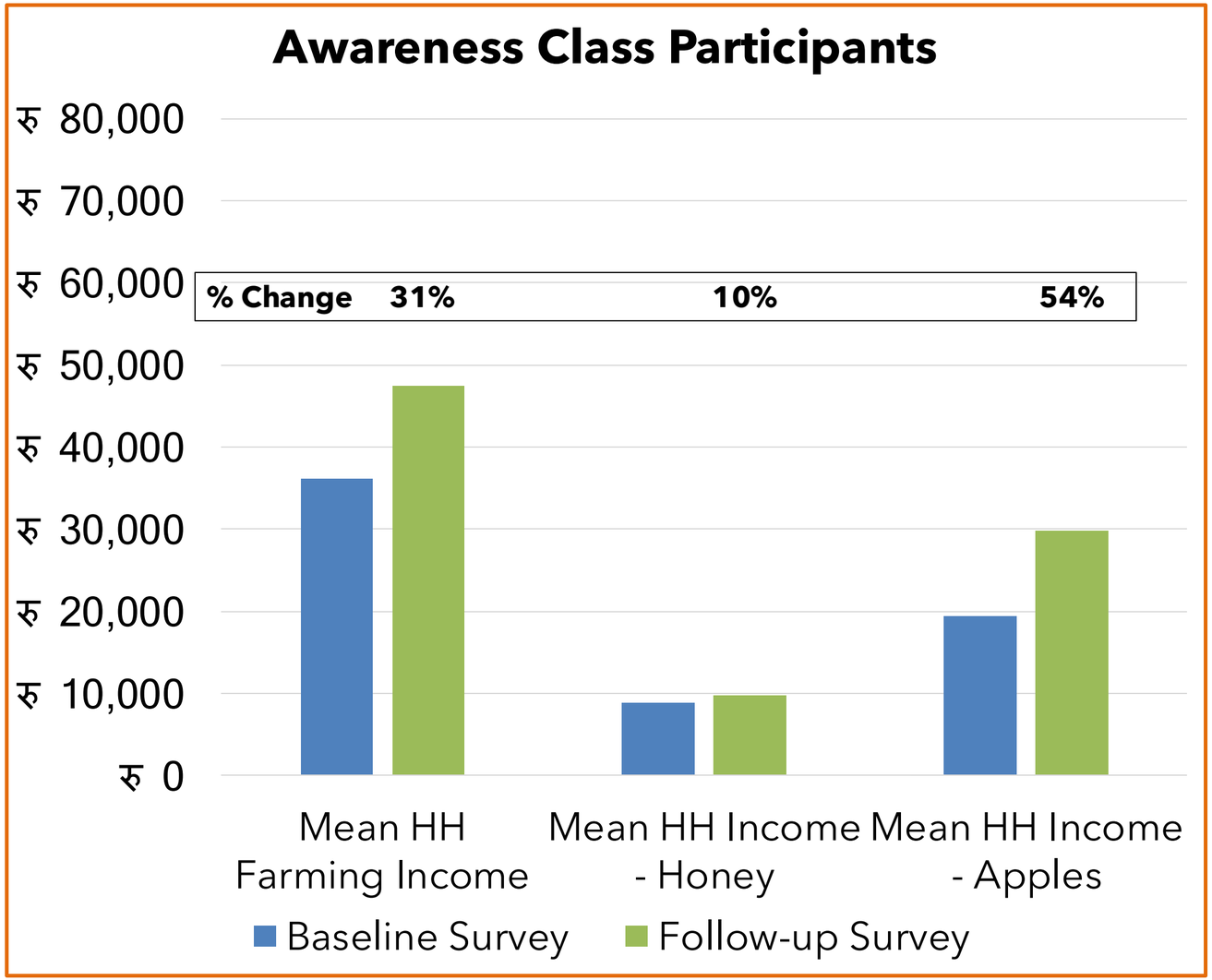
- Apple yields ↑ **36%**
- Farming income ↑ **44%**
- Jumli bean yields ↑ **3%**
- Mustard yield ↑ **2%**

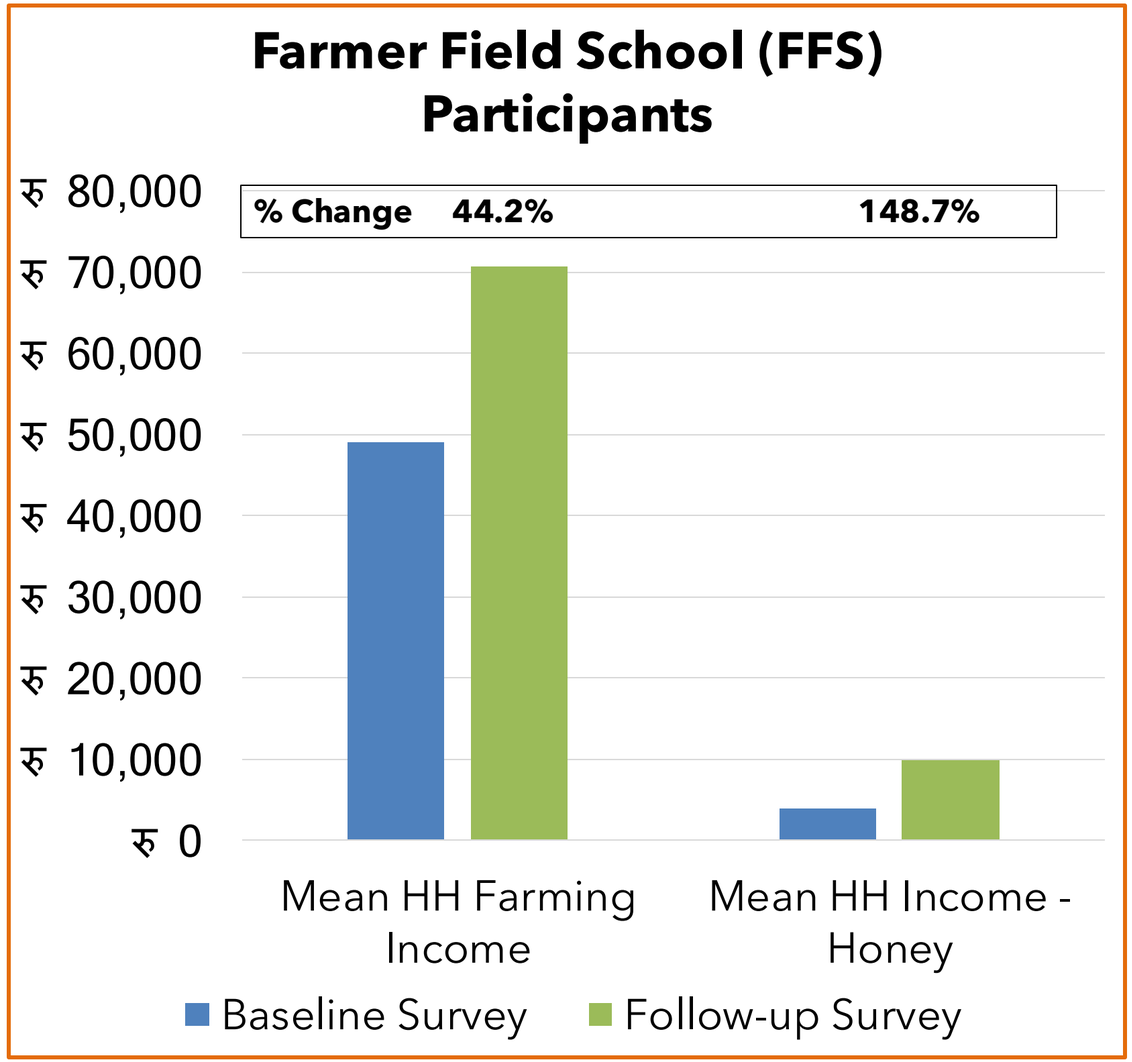


More likely to be attributable to changes in nutritional awareness, rather than changes in pollination service.

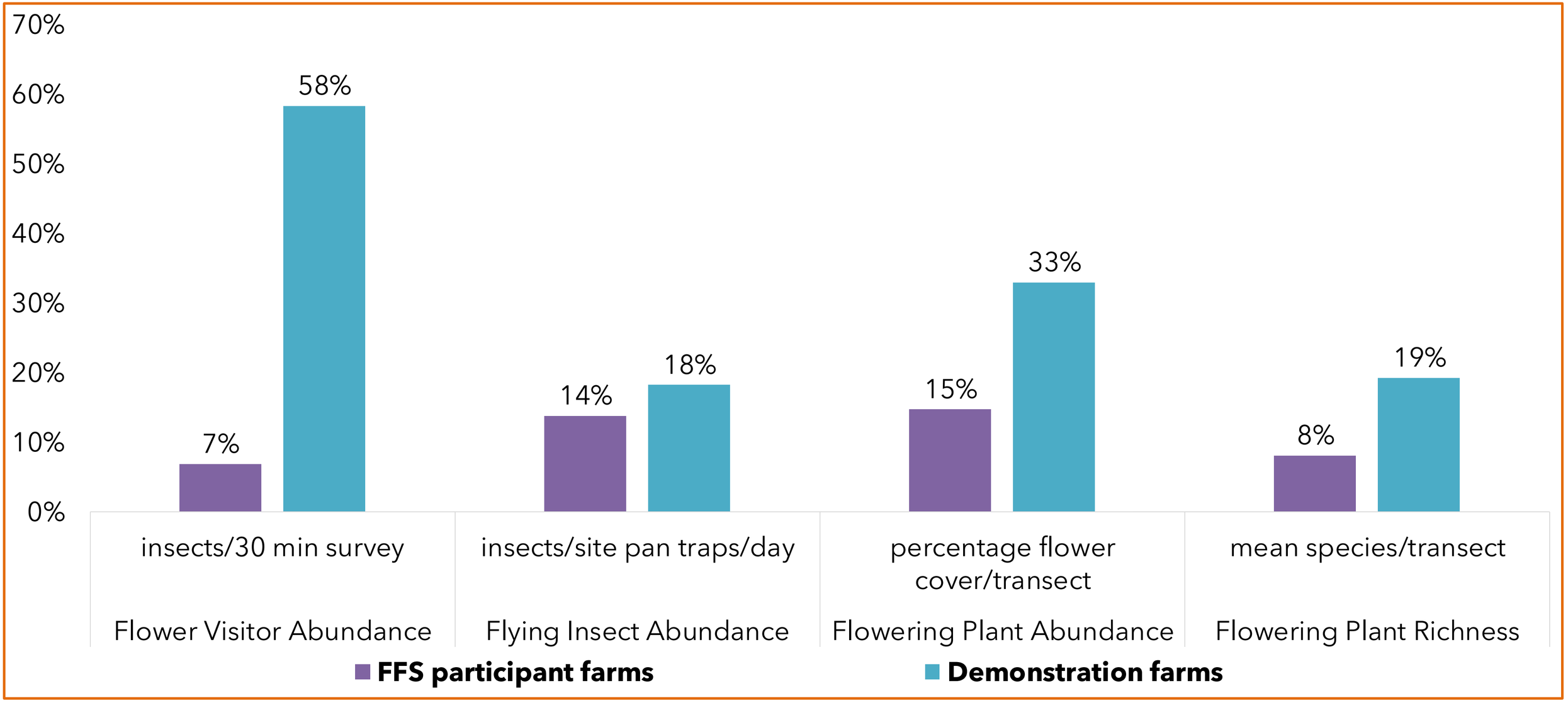
Local Agroecological Solutions Co-created and Tested

Livelihood Impacts





Biodiversity Impacts - % Change from Control Sites



Implications for Scaling and Policy

Implications for Scaling and Policy

Pollinator Awareness and Stewardship Program

Impact

Integrated pollinator conservation agroecological farming improves biodiversity, yields, nutrition, and livelihoods.

Key Enablers

Evidence-based planning, locally rooted facilitators, peer-to-peer, and practical learning approaches were key enablers

Key Barriers

Low initial awareness, remoteness and limited service access were the key barriers

Scaling Requires?

Embed the model into agriculture policies, integrate into local extension systems, institutionalize community engagements

Partnership Action

Coordinate with:

- Government agencies
- Development partners
- Universities
- Research institutions
- Grassroots networks

Pollinators are Declining in the Region, and Adoption of Pollinator Stewardship Program Across the Regions Can Reverse the Decline

Next Step...

Darwin Initiative EXTRA – £2.73 M funding approved

Upscaling Pollination to Enhance Biodiversity and Human Welfare in Nepal

Output 1: National pollinator awareness and education campaign

Output 2: Farmer engagement program

Output 3: Sustainable beekeeping initiative

Output 4: Strengthening pollination research

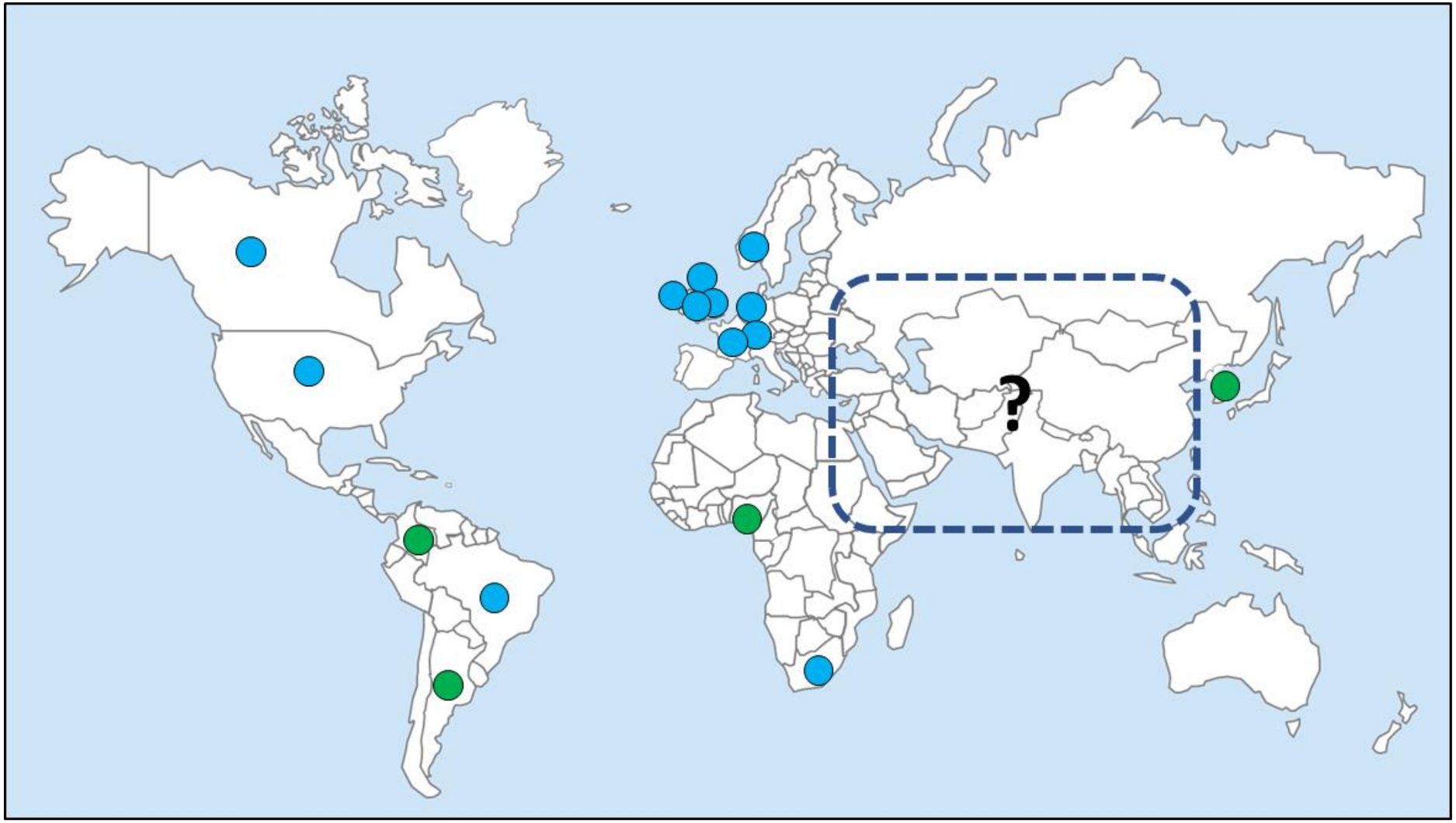
Output 5: National Pollinator Strategy for Nepal

Output 6: Himalayan Pollinator Network for sharing knowledge, collaboration & networking

This would be the first National Pollinator Strategy in South Asia

14 countries have a national pollinator strategy and at least 4 others in development

1. USA
2. United Kingdom
3. Canada
4. Brazil
5. France
6. Germany
7. Norway
8. Switzerland
9. Belgium
10. Slovenia
11. Ireland
12. Australia
13. New Zealand
14. South Africa



My participation was made possible through the generous support of the

Delivering for Nutrition 2025 Conference funders

This work was funded by the Darwin Initiative: UK Government Grants Scheme