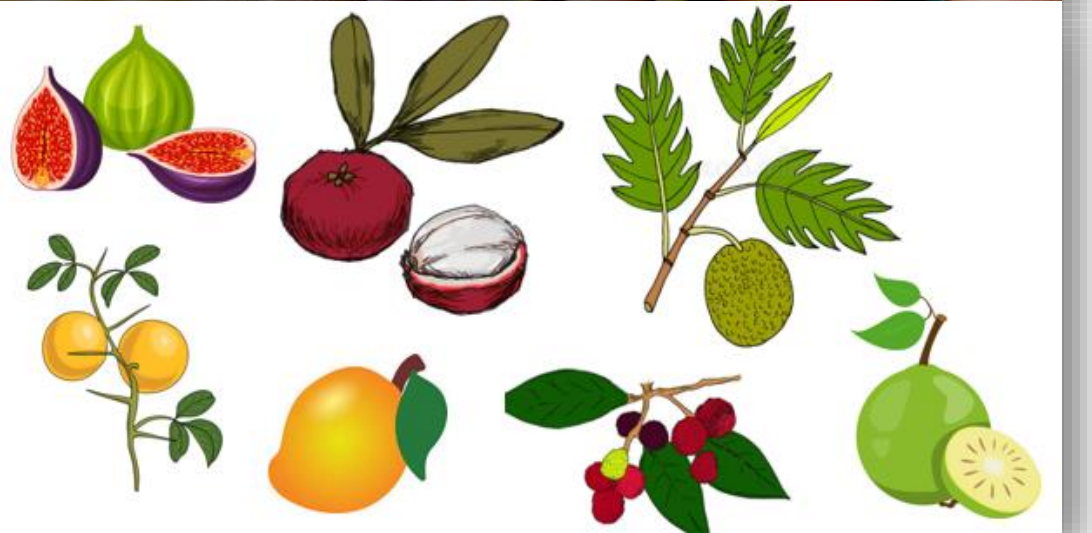

Kiwifruit as a Catalyst for Crop Diversification and Nutrition in the Himalayan Mid-Hills under Climate Change

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1. Introduction to project

- Since 1963, the station has played a pivotal role in the introduction and conservation of kiwifruit germplasm with multiple repetitive trait specific introductions over time to ensure genetic diversity, adaptability, and commercial viability
- Himalayan region warming faster than global average; Trans-Himalaya particularly affected
- Cropping zones shifting upslope; apples towards non traditional area and stone fruits are also facing problems
- Shifting phenology, earlier flowering/fruiting, and extended frost-free periods changing growing seasons
- Climate change is reducing staple crop productivity at lower elevations in the Himalayan region

Kiwifruit offers

- High nutritional value, rich in vitamin C, antioxidants, and minerals, contributing to nutritional security, digestive benefits via fiber and actinidin enzyme
- Low disease and pest pressure, making it resilient under global warming scenarios
- Suitability for multi-location cultivation trials, enabling adaptation to diverse mid-hill agro-climatic zones
- Potential for high returns and promotion of crop diversification

2. Project Objectives

Objective 1: Performance and quality evaluation of new kiwi fruit varieties in multi-location trials across Himalayan mid-hills.

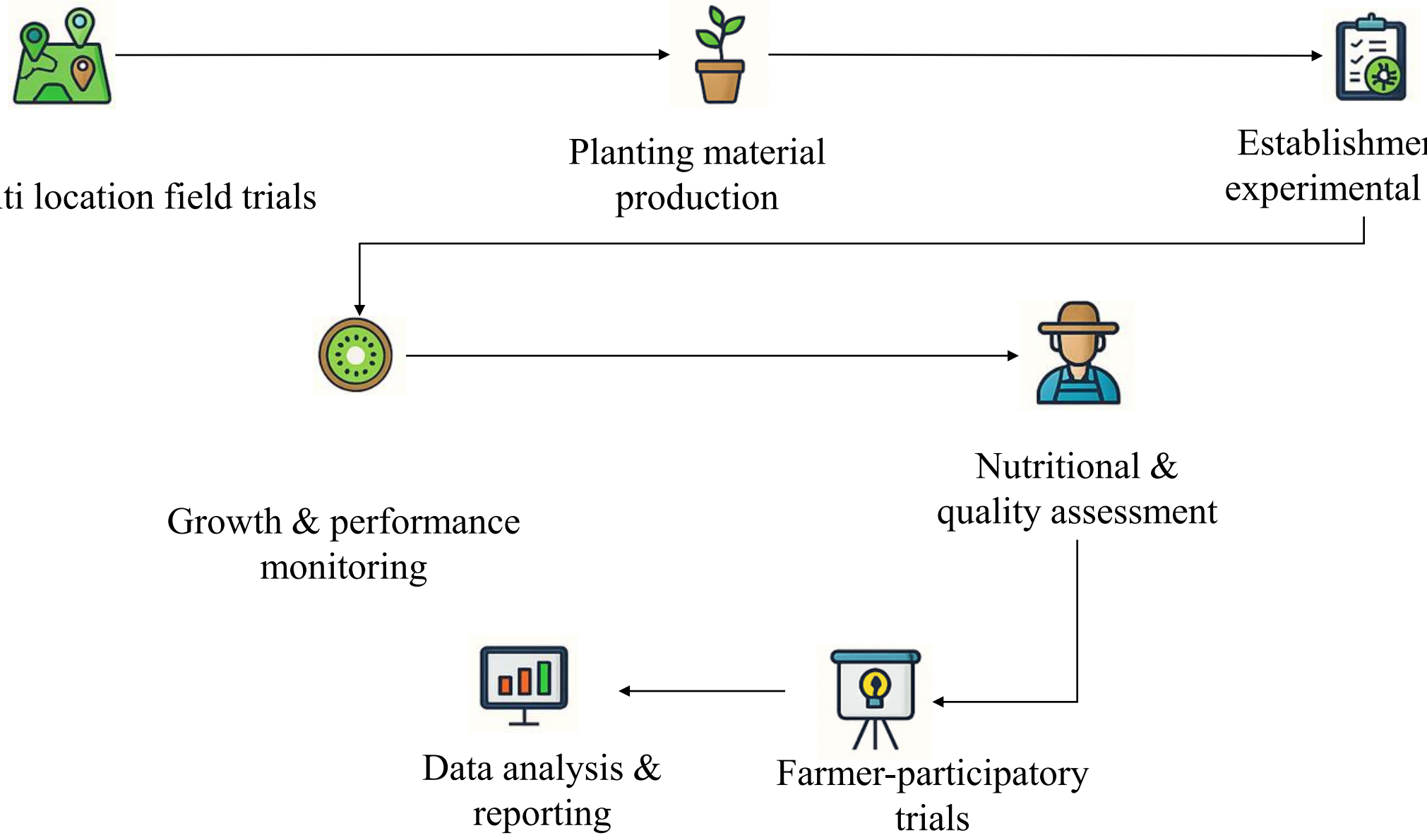
Objective 2: Promoting sustainable crop diversification via access to quality planting material for diverse farmer groups.

Objective 3: Enhancing nutritional security through the cultivation of nutrient-rich kiwi fruit varieties.

3. Methodology and implementation approach (1)

- Multi-location field trials of new and existing kiwifruit varieties will be conducted across selected agroecological zones to assess adaptability and performance.
- Healthy planting materials will be propagated and shared with research partners
- Experimental plots will use trellis and drip systems for efficient water use, with varietal diversification to minimize climatic and pest risks.
- Nutritional profiling will assess vitamin C, antioxidants, minerals, fruit quality, and shelf-life.
- On-farm participatory trials with farmers and kitchen gardeners will evaluate varietal performance.
- Training, workshops, and technical bulletins will enhance stakeholder knowledge and adoption.
- Statistical analysis will identify varietal differences; findings shared through reports and field demonstrations.

3. Methodology and implementation approach (2)



4. Timeframe for this project

Activities ↓ Months →	Year 1				Year 2				Year 3			
	3	6	9	12	15	18	21	24	27	30	33	36
Systematic site selection and establish nurseries												
Initiate planting												
Multi-location trials and performance monitoring												
Implement foundational training and awareness programs												
Multi-location trials and consistent monitoring protocols												
Initiate on-farm participatory trials and data collection												
Deliver mid-term capacity-building sessions (training workshops)												
Final monitoring (comprehensive nutritional and agronomic analyses)												
Sustain participatory trials (farmer adoption and feedback integration)												
Analysis complete dataset using advanced statistical methodologies												
Disseminate results through detailed scientific reports												
Conducting field days, stakeholder workshops, and bulletins												

5. Social and nutrition impact pathway – Project outcomes/Impact

Outputs

- Superior pest-tolerant kiwifruit varieties identified
- Demo plots established in Himalayan mid-hills
- Knowledge transfer and capacity building for local farmers

Outcomes

- Diversified cropping patterns and increased resilience
- Stable yields, improved income, and adoption by varied farmer groups
- Local kiwifruit value chains development

Social & Nutrition Impacts

- Strengthened, sustainable livelihoods for hill farmers
- Improved dietary diversity and nutrition from nutrient-rich kiwifruit
- Community health benefits, including reduced micronutrient deficiencies
- Greater empowerment and inclusion of women/youth

6. Environmental and climate advantages

Reduced Soil Erosion

- Dense perennial root systems that stabilize fragile hill slopes.
- Reduced topsoil loss during monsoon rainfall.

Enhanced Biodiversity

- Orchards support understory vegetation, pollinators, and micro-fauna.
- Replaces abandoned or degraded terraces with multi-species.

Soil Fertility Improvement

- Leaf litter and pruning biomass increase soil organic carbon.
- Encourages microbial activity and nutrient cycling.

Carbon Sequestration & Climate Resilience

- Orchards act as long-term carbon sinks.
- Vines tolerate cool climates, making them suitable for warming
- Sustainable alternative to shifting or declining hill agriculture.

Water Efficiency

- Requires moderate irrigation.
- Micro-irrigation reduces runoff and allows efficient water use.

Adaptation to Changing Climate Patterns

- Performs well in rising temperatures in mid-hills (900–1800 m amsl).
- Longer growing season under warming trends enhances productivity.

7. Scaling, sustainability and cost efficiency

Scalability of the Model

- Easily expandable across similar agro-climatic regions
- Govt. institutions and local nurseries can replicate planting material production
- High adoption potential due to growing market demand

Cost Efficiency

- Lower long-term costs due to perennial nature of kiwi orchards
- Micro-irrigation and trellising systems reduce water and labor requirements
- Shared community infrastructure (nurseries, packhouses) improves efficiency

Long-Term Sustainability

- Perennial orchards provide stable, recurring yields
- Reduced input dependence (pesticides, land preparation)
- Strengthens local livelihoods and decreases out-migration

Institutional & Market Strengthening

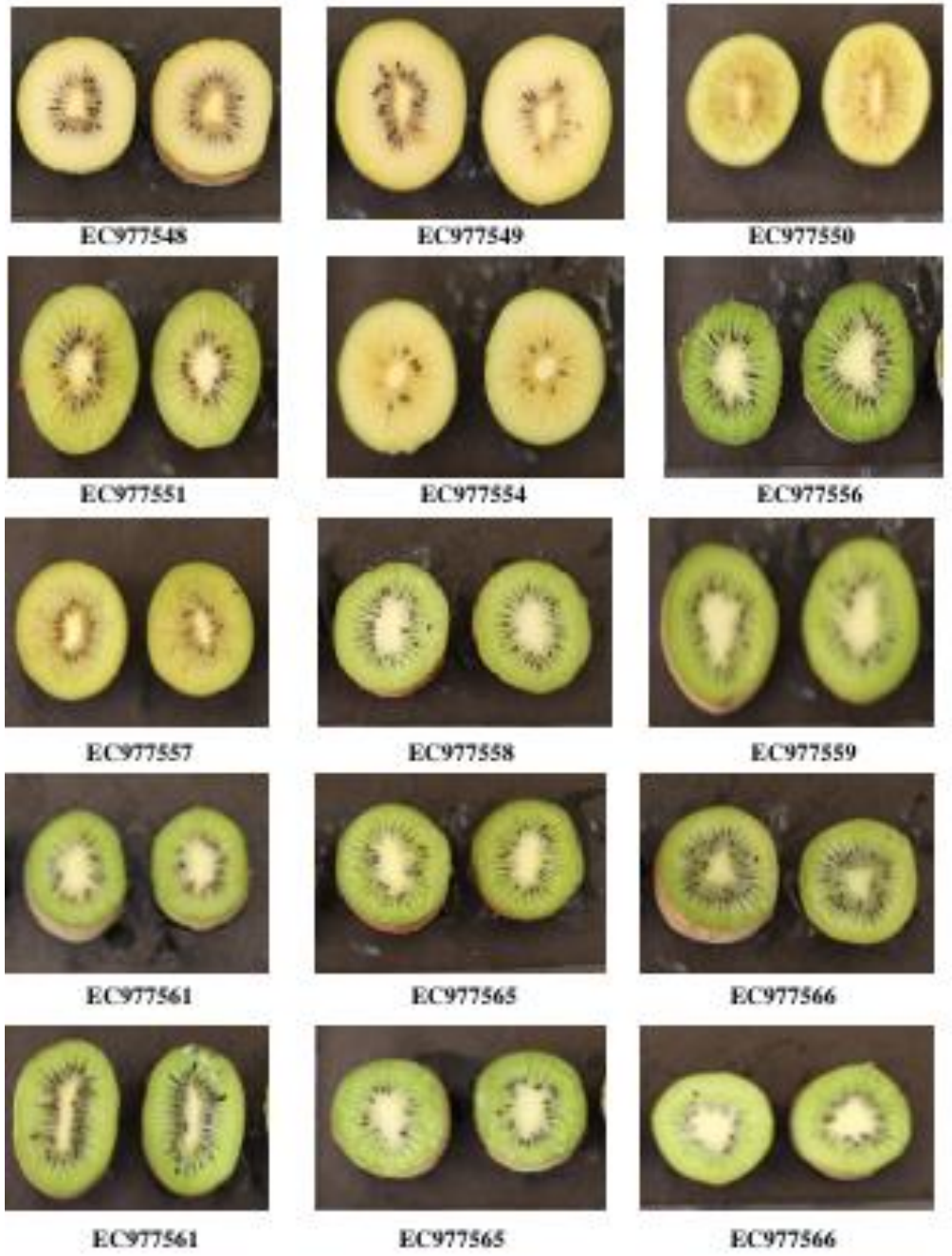
- Scope for integration with state horticulture missions and other schemes
- Value-chain strengthening (grading, storage, marketing) makes system more competitive
- Opportunities for women- and youth-led enterprises

8.Budget summary and risk and mitigation strategy:

Expenditure type	Details	Year 1	Year 2	Year 3	Total
A. Non-recurring*	Equipment and accessories*	300000	0	0	300000
Total A		300000	0	0	300000
	Manpower/Project staff salary (YP-I)	360000	360000	360000	1080000
B. Recurring	Travel and subsistence	100000	150000	150000	400000
	Consumables	350000	300000	250000	900000
	Other cost and contingency	200000	400000	400000	1000000
Total B		1010000	1210000	1160000	3380000
Total (A+B)		1310000	1210000	1160000	3680000
Overhead		151000	85000	80000	316000
Final project cost					3996000

First year of Planting

FGB as on today



Kiwifruit Field Day 29th October, 2025

Alliance Bioversity & CIAT

CGIAR

Thanks