International Finance Corporation
World Bank Group

Pilot Program for Climate Resilience (PPCR) –

Private Sector Approach in Promoting Climate Resilient Agribusiness

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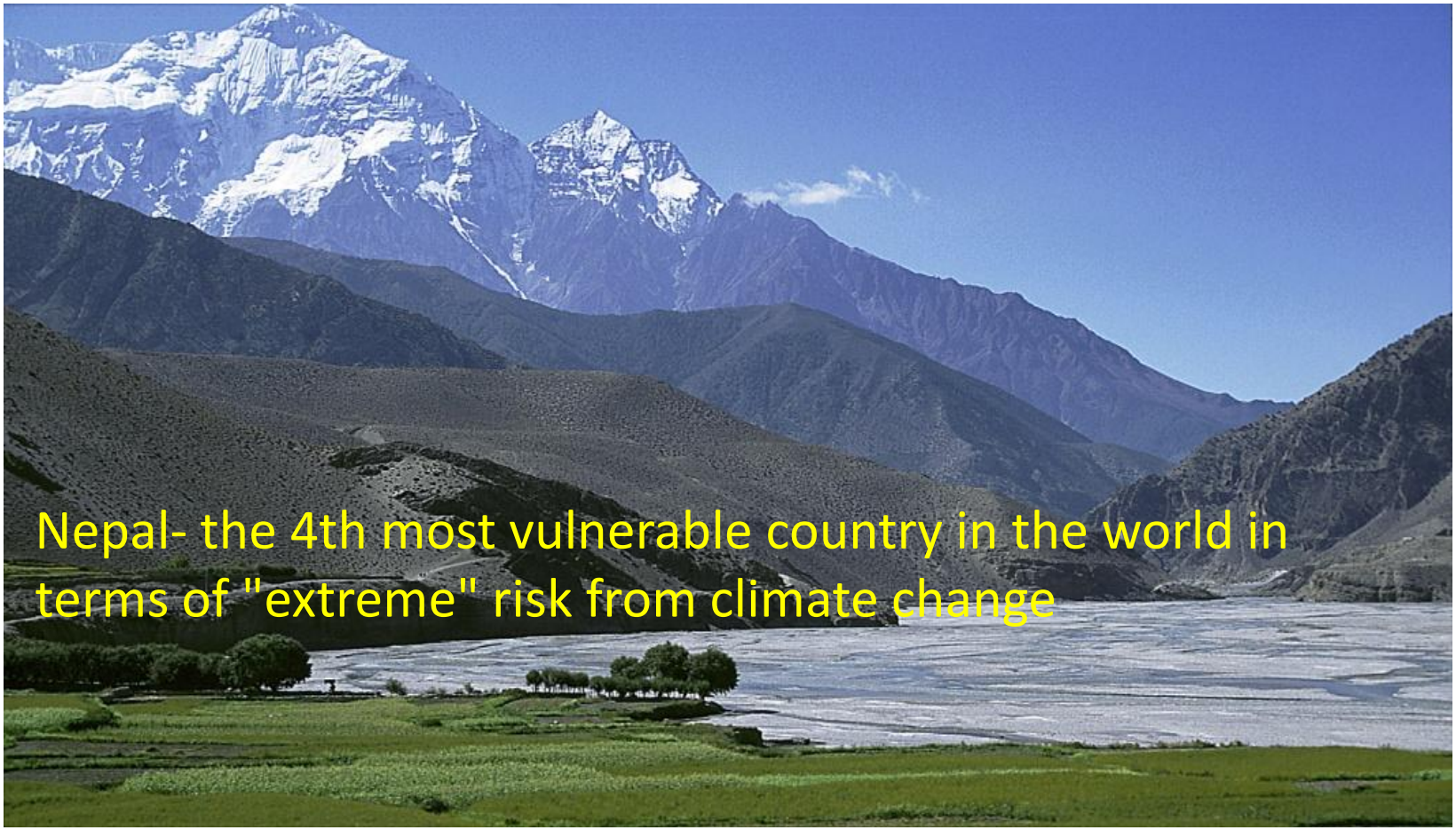
PPCR Pilot Country Meetings, Washington DC

May 03, 2013

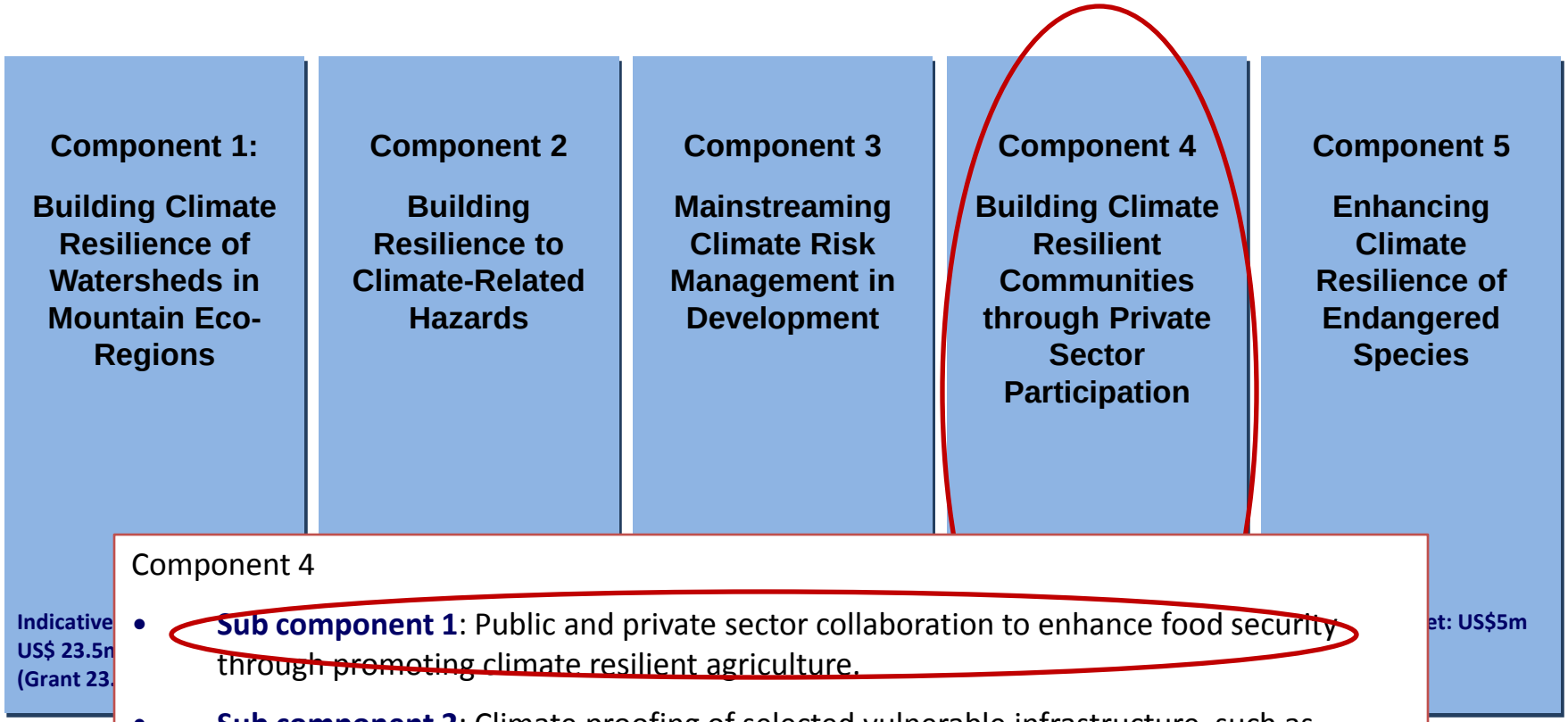
Presentation Highlights

1. Nepal PPCR
2. Program Preparation – Promoting Climate Resilient Agribusiness
3. The Program

Nepal PPCR


Nepal- the 4th most vulnerable country in the world in terms of "extreme" risk from climate change

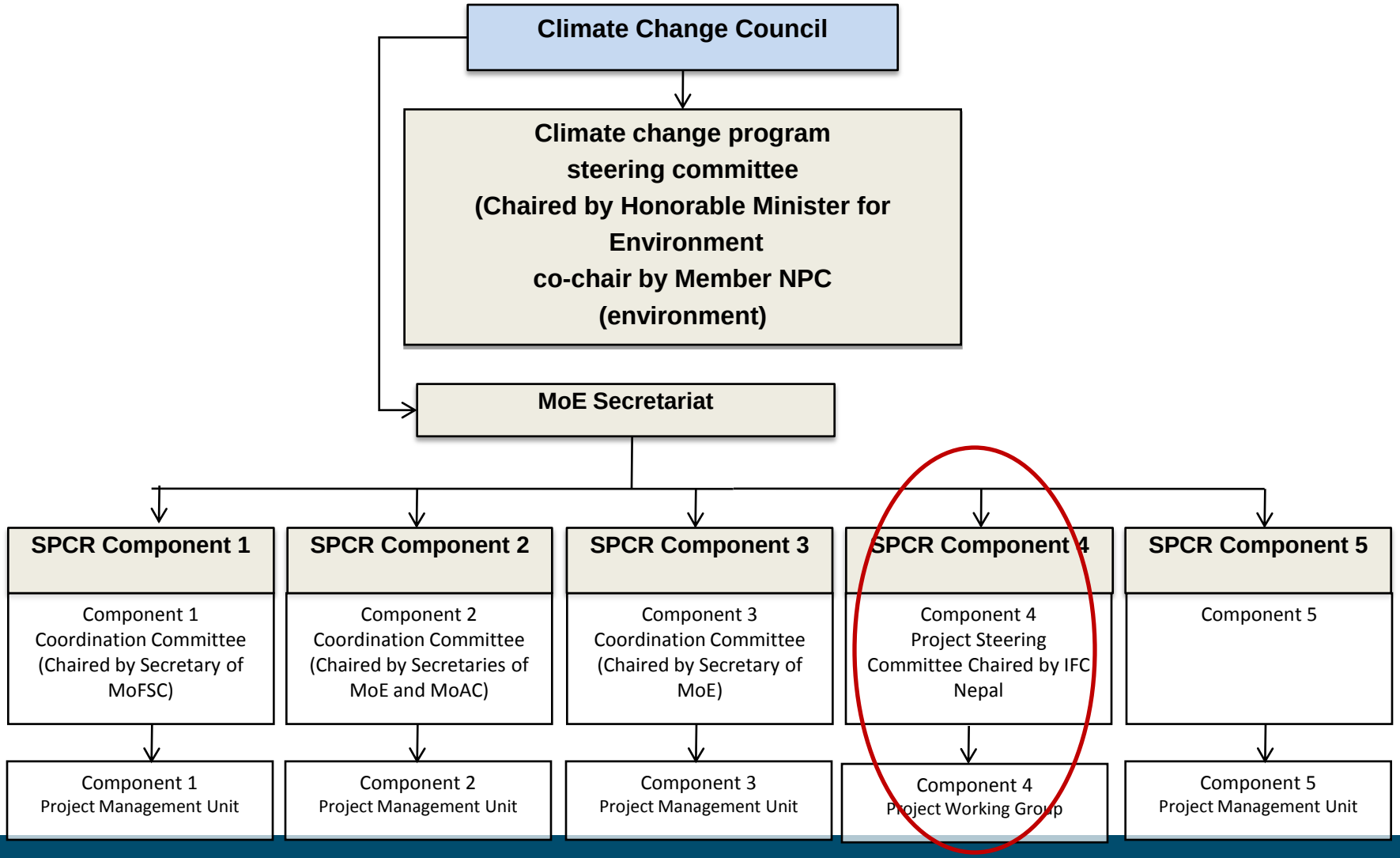
Nepal PPCR Components



Component 4

- **Sub component 1**: Public and private sector collaboration to enhance food security through promoting climate resilient agriculture.
- **Sub component 2**: Climate proofing of selected vulnerable infrastructure such as private hydropower stations
- **Sub component 3:** Feasibility Study for Low Cost Climate Resilient Housing

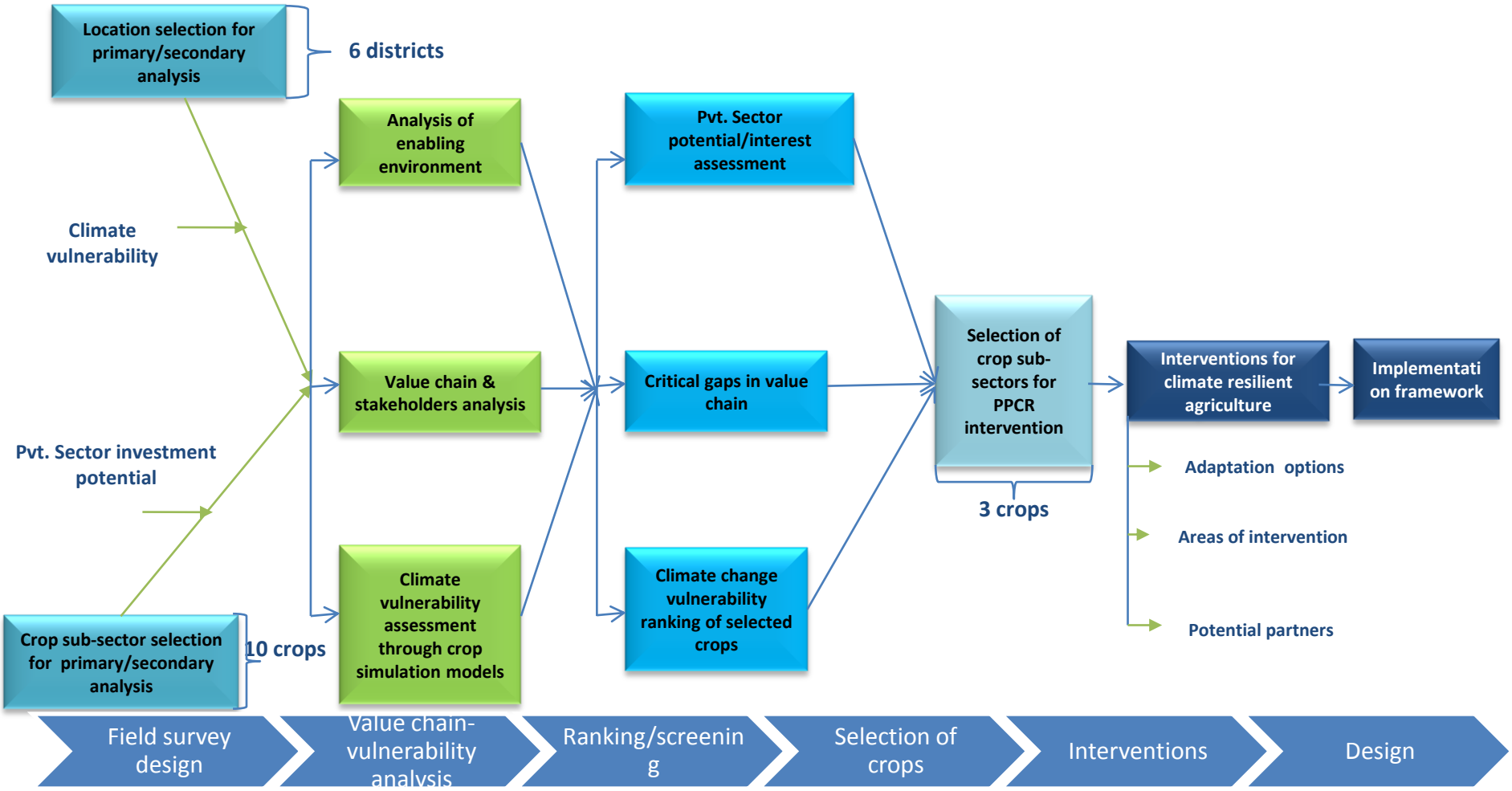
Institutional Setup for Implementation



Program Preparation –

Promoting Climate Resilient Agribusiness

Approach & Methodology



Primary Survey- Survey locations & Stakeholder profile

Number of producers and market chain players surveyed

SN	Locations	Terrain	Settlement or village	Farmers	Seed Supplier	Irrigation Equipment supplier / manufa-cturer	Fertilizer Dealer	Feed Supplier	Trader
1	Saptari	Terai	23	75	6	3	4	3	2
2	Ramechhap	Mid-Hills	26	75	2	4	1	2	NA
3	Dolakha	Mountain	18	75	1	1	3	1	1
4	Chitwan	Terai	24	78	5	4	5	2	2
5	Lamjung	Mid-Hills	19	75	5	5	4	2	2
6	Dailekh	Mid-Hills	24	75	4	1	0	1	2
Total			**134**	**453**	**23**	**18**	**17**	**11**	**9**

- Sample districts determined to match with proportion of physical area covered by each of mountains, mid-hills and terai regions
- 48 VDC's in 6 districts were covered during primary survey

Sub-sectors assessed / Value chains

- Cereals - Rice, maize and wheat
- Vegetables - tomato, potato and cole crops (cabbage and cauliflower)
- Pulses & Oil seeds - mustard & lentil
- Livestock - dairy and poultry

Vulnerability Analysis –

Significant warming is inferred in all the three regions

Climate projections at different terrains in Nepal									
Time	**Anomaly in 2030**			**Anomaly in 2050**			**Anomaly in 2080**		
Parameter	Tmax	Tmin	Rainfall	Tmax	Tmin	Rainfall	Tmax	Tmin	Rainfall
Unit	^{0}C	^{0}C	%	^{0}C	^{0}C	%	^{0}C	^{0}C	%
Hill	1.1	1.3	1.2	2.3	2.5	5.0	4.9	5.2	13.5
Mountain	1.3	1.1	2.1	1.8	2.2	12.6	3.2	3.2	19.2
Terai	1.2	1.3	5.0	1.7	2.0	7.8	3.0	3.3	12.1
Source: PwC analysis									

- Climate change indicates ***significant warming in all three regions***
- ***More warming expected in higher elevation*** (Hill region) followed by mountain region. Increase in temperature in the hill region would ***increase the frequency of climate disasters*** such as floods and soil erosion
- ***Rainfall*** expected to ***increase gradually*** over time up to 19.2 % towards end century. Increased precipitation would have ***greater implications on*** the rate of top ***soil erosion***
- ***Minimum temp.*** expected to ***increase more than maximum temp. impacting crops production*** negatively due to increased respiration during night hours leading to wastage of stored food in plants

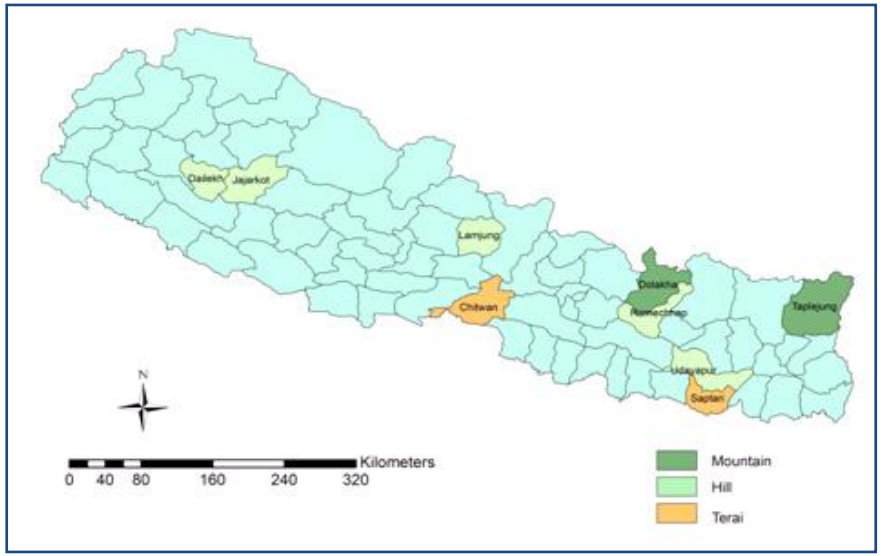
Vulnerability based crop clustering –

Rice, sugarcane, potato, tomato & maize are found to be highly vulnerable to climate change

List of models used for impact analysis		
S. N.	**Models used**	**Crops**
1	DSSAT	Sugarcane, Tomato, Cabbage, Beans
2	INFOCROP	Rice, Maize, Wheat, Potato, Millet
3	EPIC	Banana, Lentil
4	Statistical	Fruits, Mango, Guava, Garlic

Vulnerability based crop clustering		
Highly Vulnerable	**Vulnerable**	**Less vulnerable**
Maize	Mustard	Lentil
Vegetables (Tomato)	Orange	Mangoes
Potatoes	Millet	
Sugarcane	Wheat	
Rice		

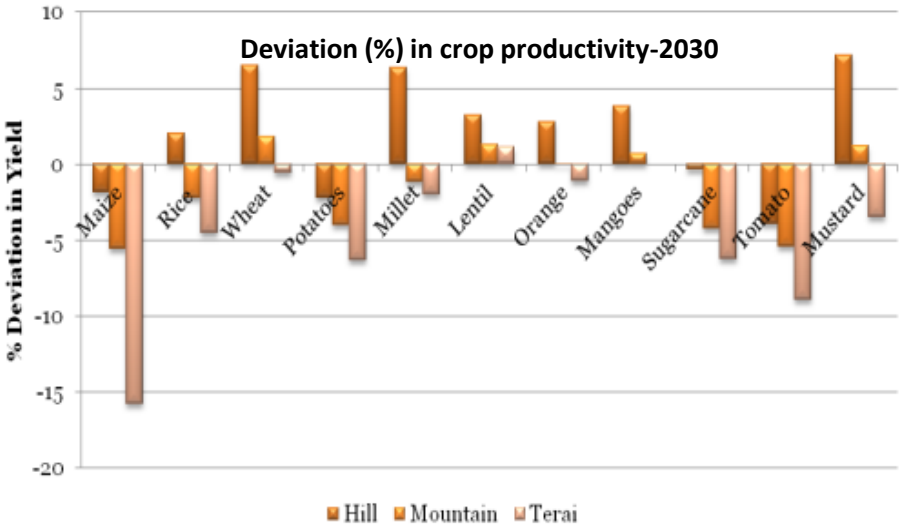
Districts selected for pilot study

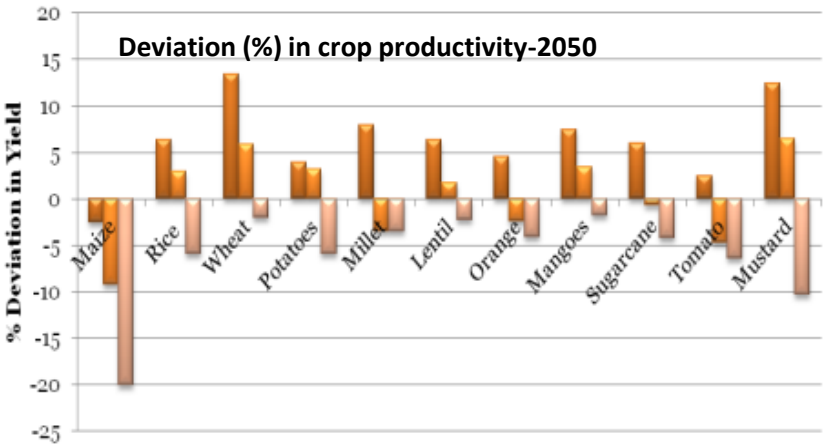


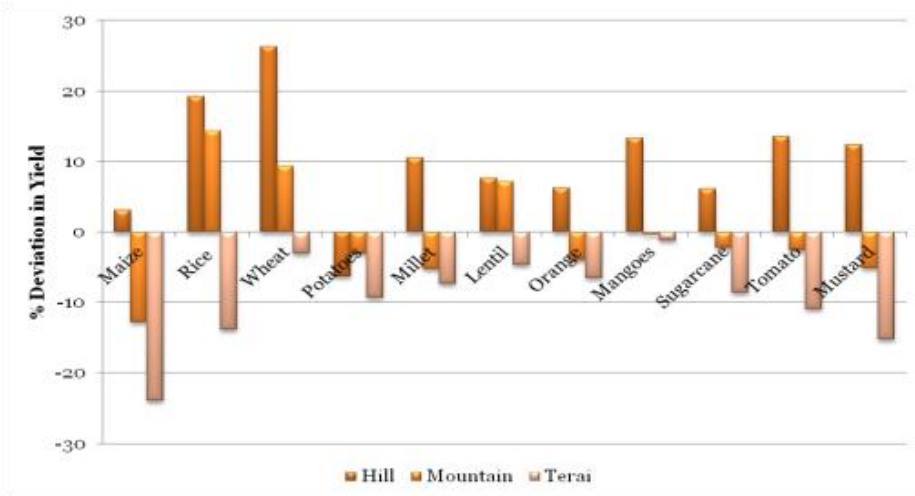
- Districts for climate change analysis included Taplejung, Dolakha, Ramechhap, Lumjung, Dailekh, Jajarkot, Udaypur, Chitwan, Saptari

Vulnerability based crop clustering –

In Terai, all crops under study exhibited declining productivity





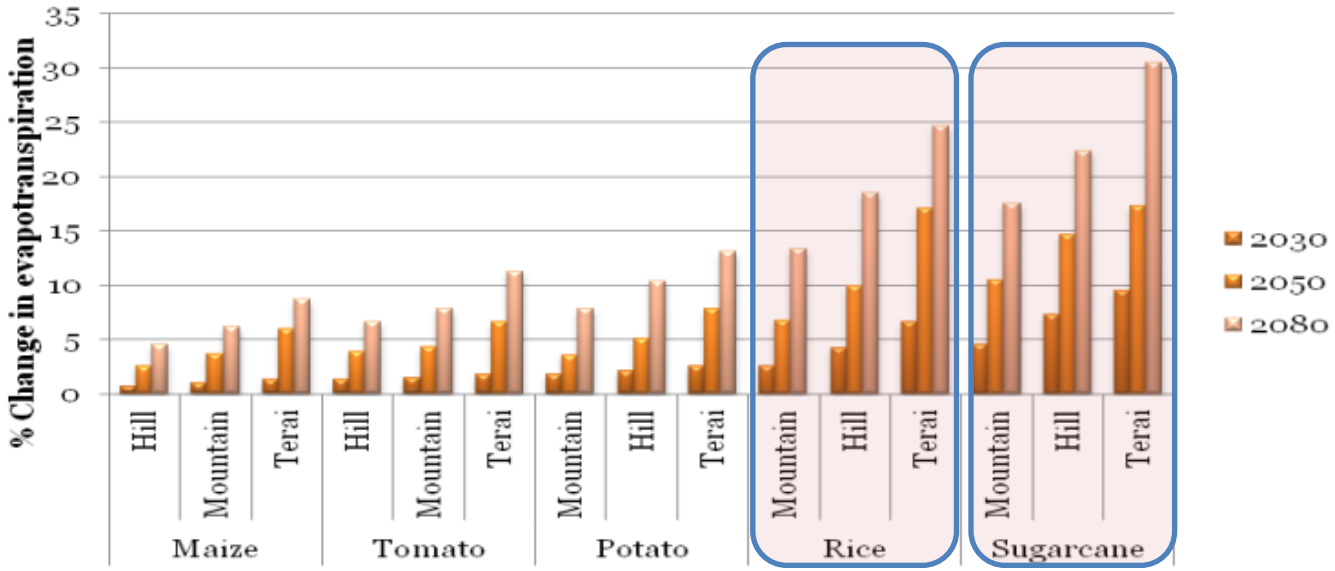


- In the near future (2030), due to change in climate, Maximum negative impact is seen in Maize crop in Terai region (-15%) followed by tomato, potato, sugarcane and rice

- In Terai region, all the crops tried, exhibited reduction in yield in mid-century (2050) & end century (2080) with varying magnitude for the change in climate

Impacts of projected climate change on water demand-

Sugarcane tops the list in increased water requirement followed by rice



- Change in water requirement of highly vulnerable crops (Maize, Vegetables, Potato, Sugarcane and rice) in Nepal was assessed using DSSAT model
- Crop water requirement for different crops in Terai region expected to increase at a higher rate than the other two regions
- Among the vulnerable crops, sugarcane tops the list in terms of increased usage of water followed by rice, potato, tomato & maize

Gender- Women outnumber men in farming activities

- In working age group, > 16 yrs & < 60 yrs., women outnumber men in farming activities involvement in all survey districts
- Highest involvement of women reported in sowing (95.8%), harvesting (97.4%), weeding and hoeing (84.8%)
- Significant involvement also reported in irrigation, application of

Imperative for acknowledging the role of women as farmers and natural resource managers and enduring their involvement for effective implementation of any climate change adaptation strategies

men in livelihood search

- Limited capacity of women to cope with increase workload & changing environment due to exclusion from decision making

Selection of potential crops for intervention

Parameters		Subsector score							
	Weights	Rice	Maize	Wheat	Sugarcane	Lentil	Potato	Tomato	Mustard
Quantitative Parameters									
Vulnerability to climate change(% productivity decline aross different regions in 2030 & 2050)	**30**	15	30	0	25	0	10	25	15
Percentage Contribution to dietary energy requirement#	**10**	10	6	5	1	8	1	0.5	1
Percentage Contribution to GDP	**10**	10	2	2	1	1	4	0.4	0.58
Estimated reach to number of farmers (in million)	**20**	20	12	10	1	3	3	0.2	2.69
Growth potential (Unmet market demand) in thousand tonnes of import	**5**	5	2	0.1	1	2	2	0.1	0.27
Comparative Level of Commercialization (Private Sector Involvement)	**15**	15	2	3	6	1	0	0	13
Qualitative Parameters									
Level of interest amongst pvt. sector (Training, Information, Marketing)	**5**	1	3	1	5	1	1	1	1
Perceived ease of partnership with producers	**5**	3	3	1	5	1	2	1	2
Overall weighted average score	**100**	**79.01**	**59.42**	**21.62**	**44.47**	**15.98**	**22.89**	**28.19**	**34.70**

The Program


National Stakeholders Workshop
on
Findings of Diagnostic Report
'Scoping Study on Climate Resilient Agriculture
and Food Security-PPCR, Nepal'

Nepal: Agricultural Context

- The agricultural sector employs over two-thirds of the labor force and contributes to roughly one-third of the gross domestic product
- Fragmented supply chain with average land holding of 0.5 ha and low farm level productivity
- Feminization of agriculture
- 20 million farmers, of whom 96% are smallholders, are likely to face increased climatic variability

Anticipated Changes to Climate in the Terai region :
•Increase in temperature
•Intensive rainfall events, increases in frequency and intensity of floods, and changes in monsoon patterns

Anticipated Impacts of Climate Change on production of the target crops (rice, maize, sugar):
Decrease in productivity
•Increased water requirements
•Decrease in soil fertility
•Increase in pests

Market Barriers

Access to Technology

- *Low levels of awareness and adoption of climate-resilient seed varieties*
- *Lack of reliable, and affordable access to water resources, and poor water management practices*
- *Inadequate input availability and knowledge of agriculture practices, especially related to climate change*
- *Absence of robust weather information delivery and early warning systems*

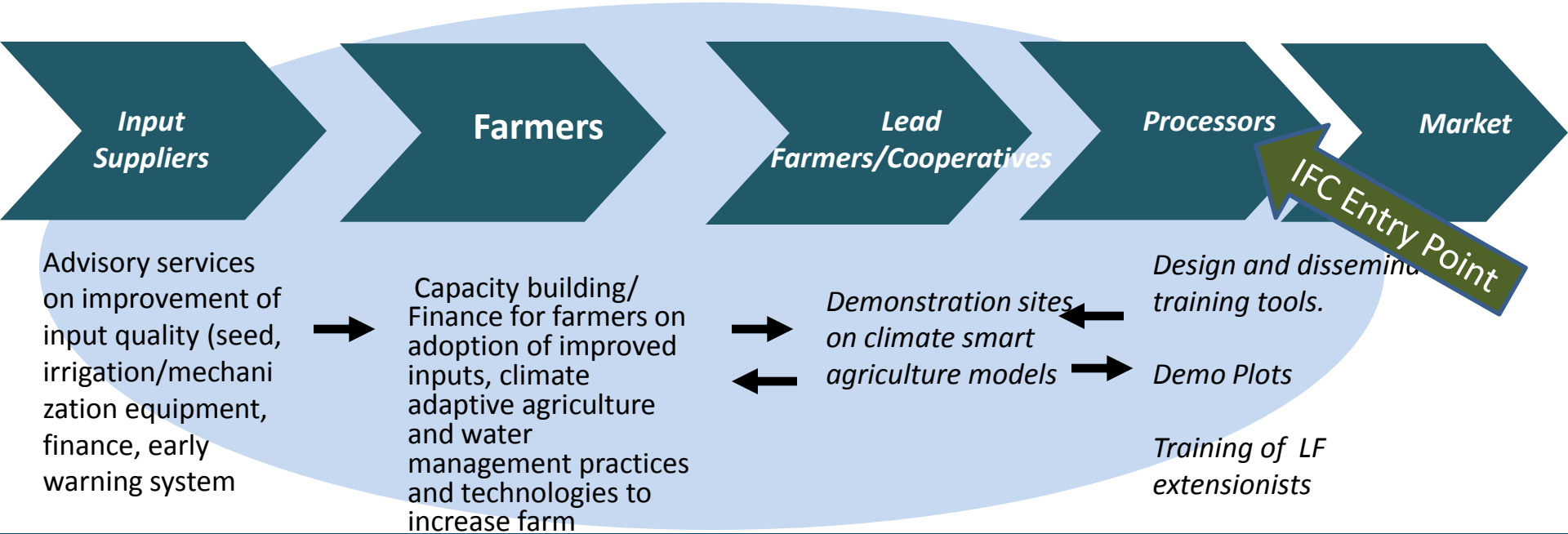
Access to Finance

- Low availability of agricultural credit
- High transaction costs to reach farming households
- Limited awareness among farmers about financial products

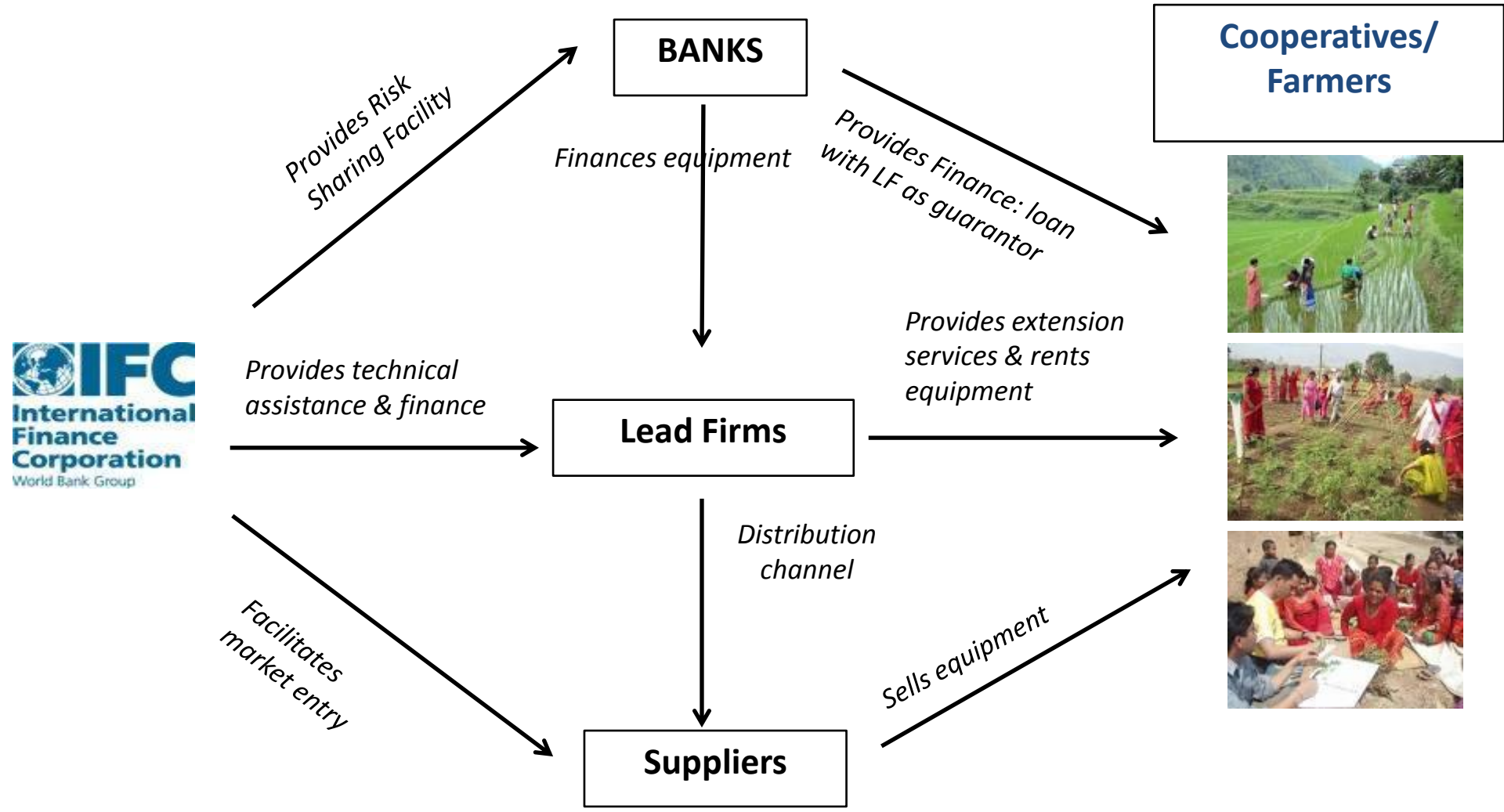
Increase Productivity by Offsetting Climate Change Risks of 15,000 farmers in Rice, Maize and Sugarcane

The Program

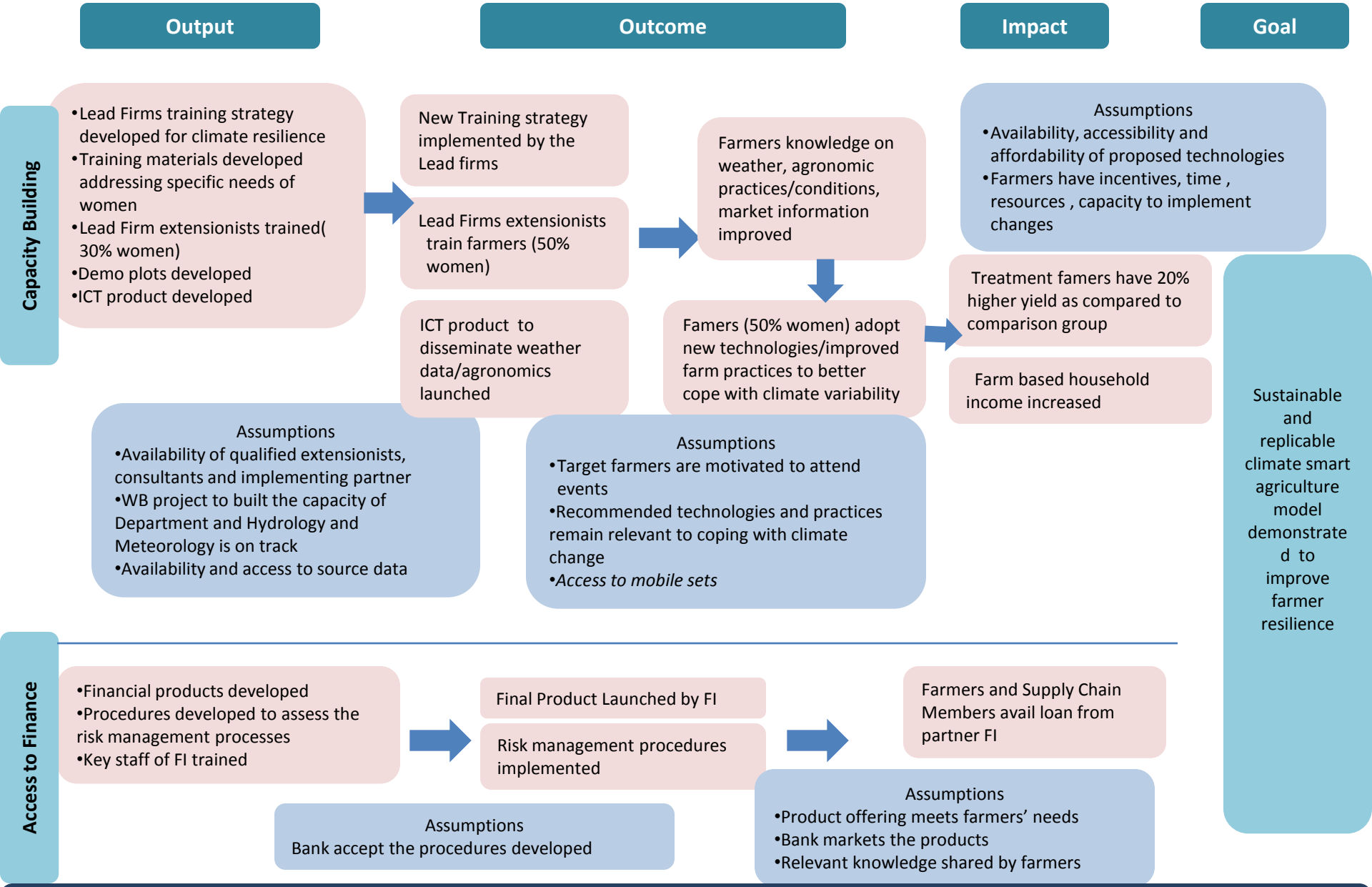
- Improved climate smart agriculture and water management practices
- Access to irrigation technologies and practices
- ICT-based early warning system to disseminate weather-related and agronomics information
- Access to Finance for usage by farmers and other agri supply chain members



Implementation Modality



Results Framework



Stakeholders: Farmers (50% women), Lead Firms, MOE, Donor, Input Suppliers, MOA, DOI, Technical Partners, Banks, Civil Society, DHM, Mobile Service Providers, IFC, Input providers

Thank You

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