
WOTR
water gives life

Identifying and Reducing Climate – Induced Risks in Rainfed Farming Systems

Experiences from the Field

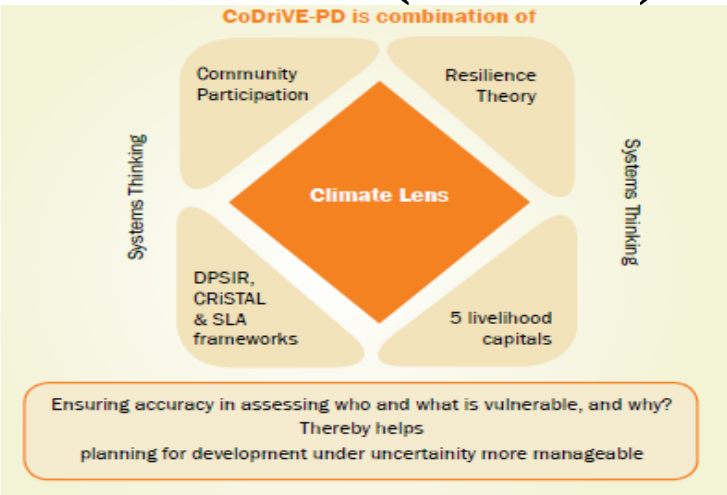
Community **Dri**ven **V**ulnerability **E**valuation- **P**rogramme **D**esign-

CoDriVE-PD

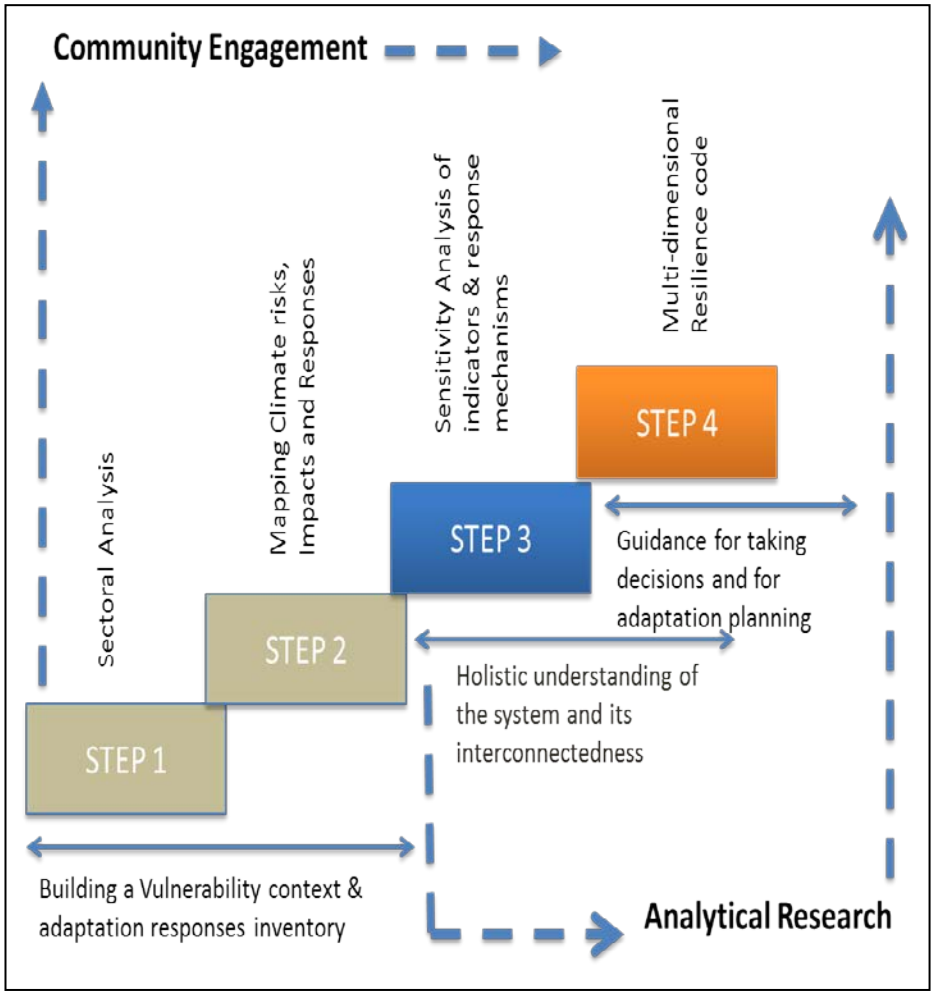
CoDriVE-PD : An Introduction

- Science based composite tool to make **quick but precise assessment of the climate risks and vulnerabilities** of an area through community engagement

- Is a recombinant tool made of **3 International Frameworks**
- **DFIDs** Sustainable Livelihoods Framework
- Driver- Pressure-State-Impact-Response **(DPSIR)**
- Participatory Tool on Climate and Disaster Risks **(CRiSTAL)**



Community Driven Vulnerability Evaluation-Programme Designer-CoDriVE-PD



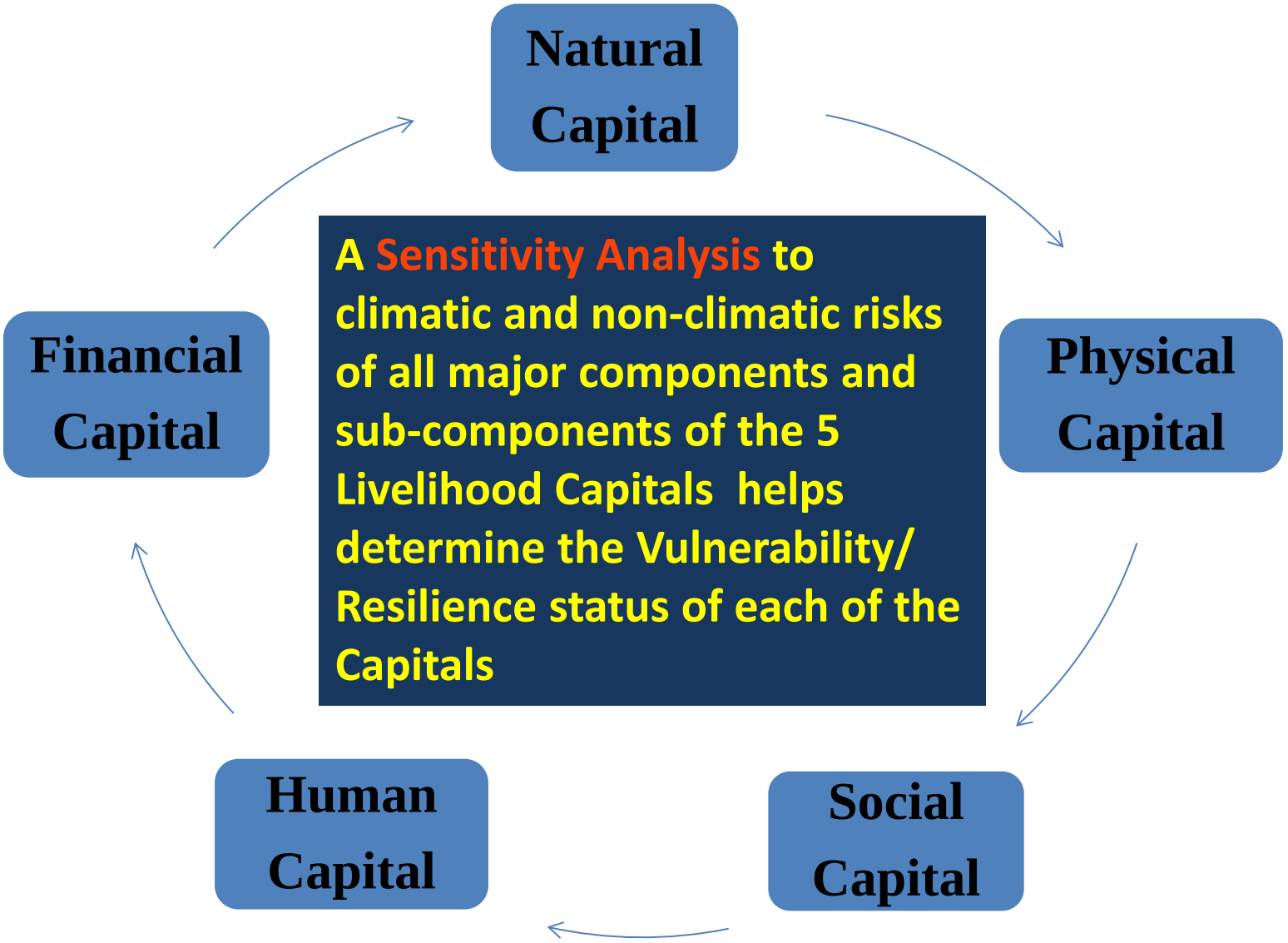
- Science based composite tool to make **quick but precise assessment of the climate risks and vulnerabilities** of an area through community engagement.
- **Can be applied at multiple levels**: watershed, landscape, village/communities, livelihood/ social group

What does it do?

- Reviews past and presents trends
- Examines externalities influencing community/peoples decisions
- Records perceptions of climate risk, its impacts and responses
- Generates multi dynamic vulnerability code based on 5 capitals Human, Physical, Financial, Social, Natural.

Courtesy: Climate Proofing Watershed Development by Marcella D'Souza; Presented at COP 22 Side Event on Scaling up Best Practices

The 5-Livelihood Capitals Framework



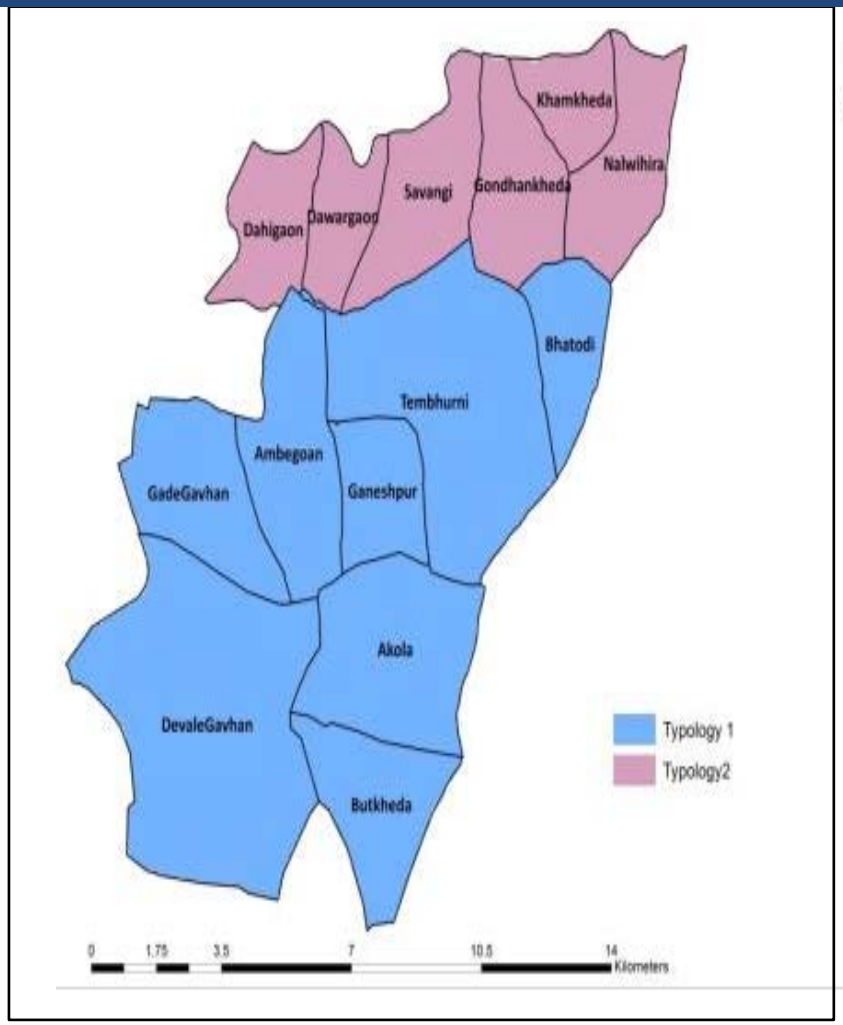
What is the Vulnerability/Resilience Code ?

- **5 digit number** based on the 5 livelihood capitals
- Each number indicates the **quantity, presence, functionality** of the capital in context to the village
- This will indicate the **degree of vulnerability** that will occur in the absence of this capital when the climate risk occurs
- To rate resilience, the selected indicators are assessed using scores:

VULNERABILITY/ RESILIENCE CODE (WITH COLOUR INDICATORS)

Nature of Vulnerability/Resilience	Score
Very High vulnerability; indicates having next to Nil Resilience	1
High Vulnerability; indicates having Very Low Resilience	2
Medium Vulnerability; indicates having Low Resilience	3
Low Vulnerability; indicates having Medium Resilience	4
Very Low Vulnerability; indicates having High Resilience	5

Applying Co-DriVE at Scale: Crafting Climate Resilience into Watershed Development Programmes



Village	Financial	Human	Natural	Physical	Social
Typology 1: Butkheda	2	2	2	1	2
Typology 2: Savangi	1	1	2	1	1

Villages: 14
Area: 14,852 ha
Population: 31,000

Rep. Villages:
Typo1: Butkheda
Typo2: Savangi

Vulnerability Status: Socio-Economic and Gender-Wise in Savangi (Typology 2)

Key stakeholders	Financial Capital	Human Capital	Natural Capital	Physical Capital	Social Capital
Large landowners	3	1	3	1	3
Small and Marginal landowners	1	1	1	1	2
Landless	1	1	1	1	2

	Financial	Human	Natural	Physical	Social
Women	2	3	3	1	2
Men	3	3	4	5	4

CRAFTING ADAPTIVE RESPONSES THAT BUILD RESILIENCE

Annexure 1. A. Biophysical Indicators: Climate Risks to Land and Water Resources - Assessment of the Current Practices for Risk Mitigation and Proposed No / Low Regret Alternatives

Indicators/ Description (Location/Type/Use)	Current Climate and non-climate Risks experienced	Projected climate and non-climatic risks (district level data)(2020-2050)	Current (and recent past) practices and coping mechanisms	Assessment of the Coping with respect to Climate Change and non-climatic risks			Proposed No / Low Regret Alternatives
				Reducing Risks	Increasing Risks	Neutral	
BIOPHYSICAL INDICATORS : LAND AND WATER RESOURCES							
LAND RESOURCES							
Undulating land farms near village with good soil cover (75% land); well above the water level of da	High intensity rainfall in a short time span; Prolonged dry spells; delayed onset of monsoons; decrease in total rainfall; Unseasonal rainfall	Pre-monsoon rainfall Increase; Monsoon increase by 1.25%; Temperature increase by 1.8-2.0degrees C and daily minimum temp increase by 2.0-2.4degrees C	Construct simple farm bunds every year	Conserves some moisture and soil	Moderately risky as it breaks with heavy rains and requires repairs every year		Contour bunds with outlets
							OR Graded bunds that flow into the stream;
							Stabilization of bunds by grass plantation
							Tree / shrub plantation
	Increase in temperature (summer & winter)		No response on farms; youth migrate in search of work		land quality worsens when left fallow; Work opportunities uncertain		Summer ploughing & ploughing before rabi
							Activities that increase biomass content

Annexure 1. B. RESILIENCE CONTINUUM FRAMEWORK FOR PROPOSED LAND AND WATER INTERVENTIONS AND SAFEGUARDS

Proposed No / Low Regret Alternatives	Assessing Proposed Interventions within the Resilience Continuum				Environmental and Social Risks in the Implementation of Proposed Activities	Adaptive measures and risk mitigation (ensuring the environmental and social safeguard policies – AF Guidelines)	Source of Funding and Responsibility
	Whether Addressing the developmental gaps (description required)	Building adaptive capacity	Managing Extreme Events	Confronting Climate Change (Impacts of climate change) Description essential			
ENHANCING LAND USED FOR AGRICULTURE, FORESTS AND GRAZING (ON ALL LANDS PRIVATE, COMMON AND FOREST LANDS)							
Follow the Ridge to Valley principle for land and water conservation			Prevents floods; reduces impacts of drought		If WSD not implemented on forest land, it will negatively affect the habitation and the agriculture land of the local communities	WSD followed on a Ridge to valley principle to be implemented on forest land and on all agriculture land of the village	
Contour bunds with outlets	Soil and water conservation				People may not want contour bunds to be put on their lands as it reduces area under agriculture	Motivation for Contour bunds OR Graded bunds is essential as it will enhance productivity	

Indications and Opportunities

- If you handle large scale projects covering many villages ….

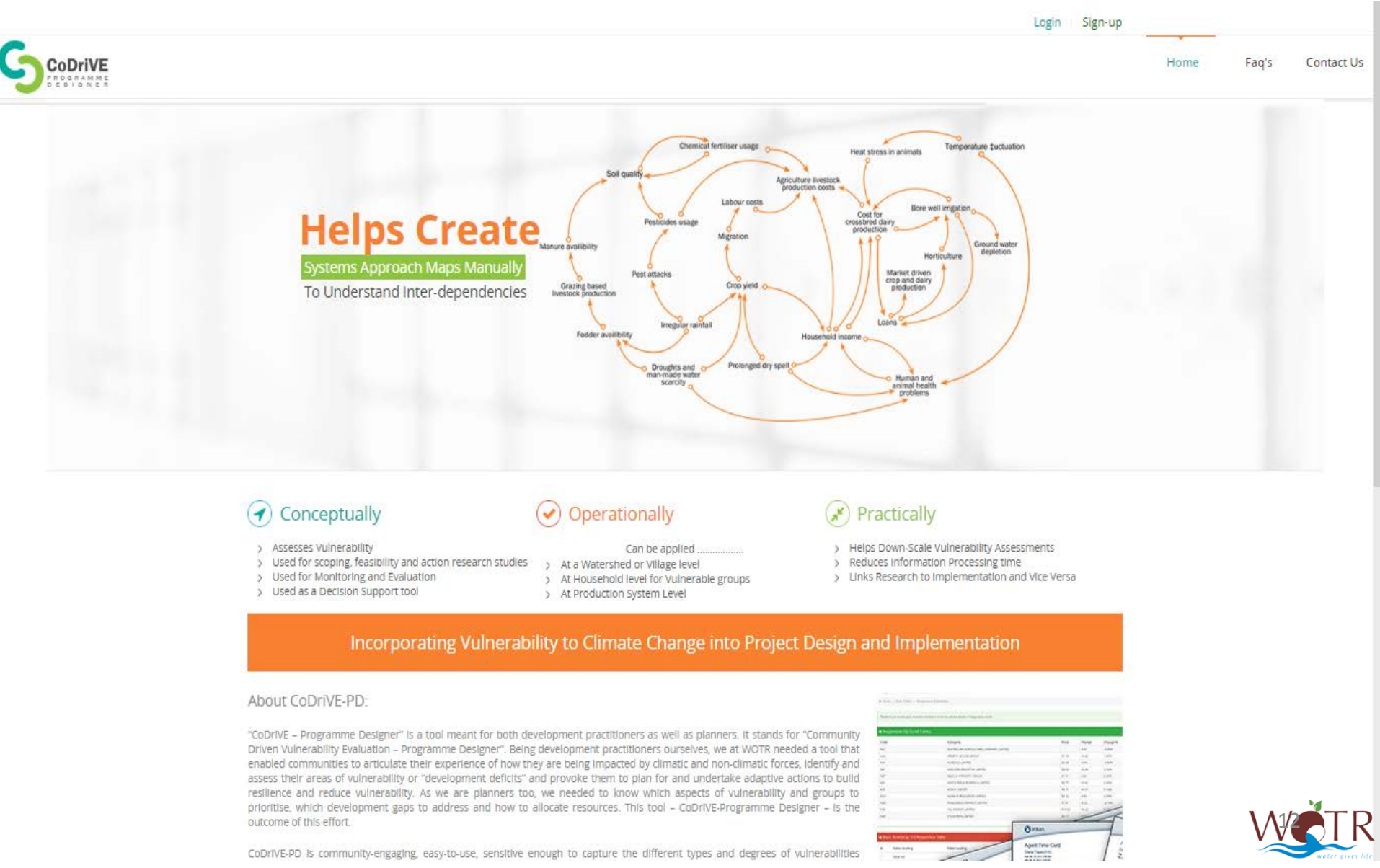
Districts	Village codes NPSHF
District 1	
Village A	12241
Village B	12332
Village C	13231
District 2	
Village A	44213
Village B	34213
Village C	44321

1. Indicates that natural capital is low in all villages in the area : helps prioritize investment and funding needs

2. Since a detailed description of the capitals is also included, location specific needs can be identified and catered to

Software Tool

http://codrive.wotr.in/CodrivePD/Forms/HomePage.aspx



Adaptive Sustainable Agriculture

FOOD & WATER

Conservation, Management, Use Efficiency

Water Availability→ Cropping Pattern

Farmer Field Schools/On-site technical support

Soil Health and Environmentally safe Practices

Water Budgeting

Locale and Weather based Crop, Livestock, Market Advisories

Integrated Water-Nutrient-Pest -Disease Management

Water Conservation Technologies

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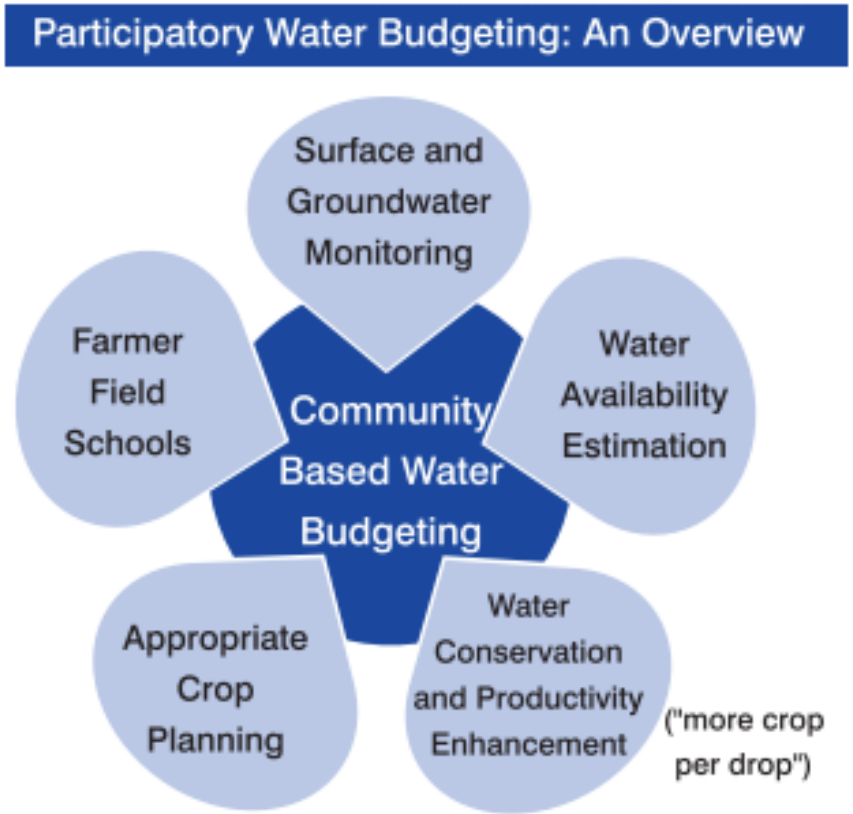
PARTICIPATORY WATER BUDGETING

"More Crop Per Drop"

A tool that **quantifies water availability** in a village, aiding its **equitable and judicious use** for all purposes, keeping in the mind **climate variability**.

Communities capacitated to:

- Monitor groundwater levels
- Prepare crop plans aiming at efficient and equitable use of underlying water resources.



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Adaptive Sustainable Agricultural Practices

1. **Agriculture demonstrations:**
   - Vermicomposting
   - Composting
   - Intercropping
   - Seed treatment with bio-fertilizers
   - Preparation of Bio-pesticides
   - System of Crop Intensification (SCI)
2. **Farmer field School (FFS):**
   - Village level Field schools
   - Exposure visits
3. **Soil testing and soil health cards:**
   - 10 important soil parameters :
     pH, EC, Organic Carbon, Nitrogen, Phosphorus, Potassium, Sulphur, Zinc, Iron and Boron

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giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

SOIL HEALTH CARD

Farmer Name : Thakaji Namdev Thokal	**Village** :Hivare Korda
Cluster: Parner	**Tehsil** : Parner
District :Ahmednagar	**Area** : 0.20 ha
Date of soil sample collection : 20/04/2016	**Gat No.** : 2
Survey No. : 125	**Soil colour** : Medium black
Previous season crop : Green gram	**Source of irrigation** : Well
Next season crop : Rabi Sorghum	**Type of irrigation** : Surface
GPS Coordinates :	

Soil Nutrient status

Elements	Availability	Category
Major Elements		
Organic carbon (%)	0.55	Medium
pH	8.3	Slightly alkaline
EC (dSm/m)	0.16	Normal
Nitrogen (kg/ha)	197	low
Phosphorus (kg/ha)	31.2	High
Potassium (kg/ha)	415	Very high
Secondary Elements		
Sulphur (ppm)	17.5	Medium
Micro nutrients		
Iron (mg/kg)	7.39	Medium
Zinc (mg/kg)	0.5	low
Boron (mg/kg)	0.2	low

Recommendations

Crop	Fertilizer dose (kg/ha)				
	FYM (t/ha)	Vermicompost (t/ha)	Urea	SSP	Time of application
Rabi Sorghum	3.5	1.5	25	50	Basal dose
	-	-	25	-	30 Days After Sowing

Agri. Officer
WOTR, Pune

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System of Crop Intensification

Systematic Application of Organic Inputs

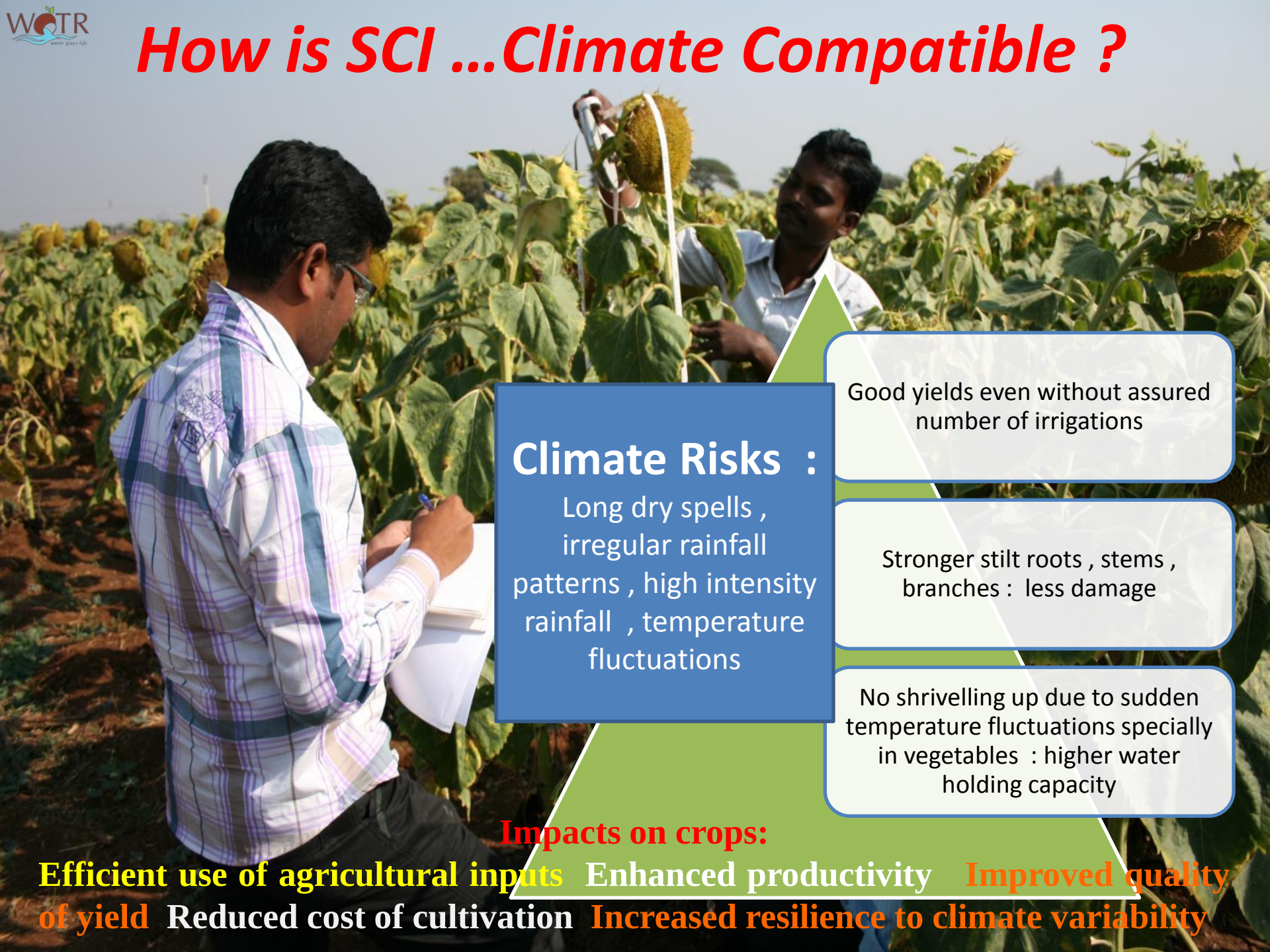
Soil Preparation and Management

Crop Geometry

Micro-nutrient foliar spray and basal applications

4 step approach to enhancing productivity of both soil & crop yields

How is SCI …Climate Compatible ?



Climate Risks :

Long dry spells , irregular rainfall patterns , high intensity rainfall , temperature fluctuations

Good yields even without assured number of irrigations

Stronger stilt roots , stems , branches : less damage

No shrivelling up due to sudden temperature fluctuations specially in vegetables : higher water holding capacity

Impacts on crops:

Efficient use of agricultural inputs **Enhanced productivity** **Improved quality of yield** **Reduced cost of cultivation** **Increased resilience to climate variability**

GROUP IRRIGATION MODEL (GIM): System of Crop Intensification (SCI) and Increased Water Use Efficiency - Yield and Cost of Cultivation

Comparision between Yield and Production Costs in vegetable cultivation between Project and non-Project Village

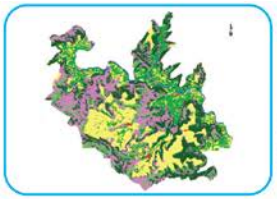
Crops	Israipalli (project village)		Non-project village	
	Average Prod.cost/acre	Average Yeilds /acre in quintals	average Prod.cost/acre	Average Yeilds /acre in quintals
Brinjal	3,772	14	20,000	15
Tomato	5,804	25	16,000	8-12 quintals
chilly	4,507	11	25,000	10-14 quintals
Ladies finger	3,580	6	20,000	14-18 quintals
Small cucumber	3,825	16	6000	10 -12 quintals

Source: FGDs with farmers in neighbouring village and Israipalli village 18 HHs data.

Farmer-Friendly Agro-Meteorology

The Agro-Met Advisory System: An Overview

Awareness building and sensitization of local communities



GIS Database: Land, Farm Resources and Crops

Indigenous Knowledge & Traditional Systems

Automated Weather Stations installed in villages

Weather Data Transfer

Indian Meteorological Department (IMD)

3 day weather forecasts

AGRIMATE:Crop Weather CalendarSystem

Farmers Feedback /Training Sessions

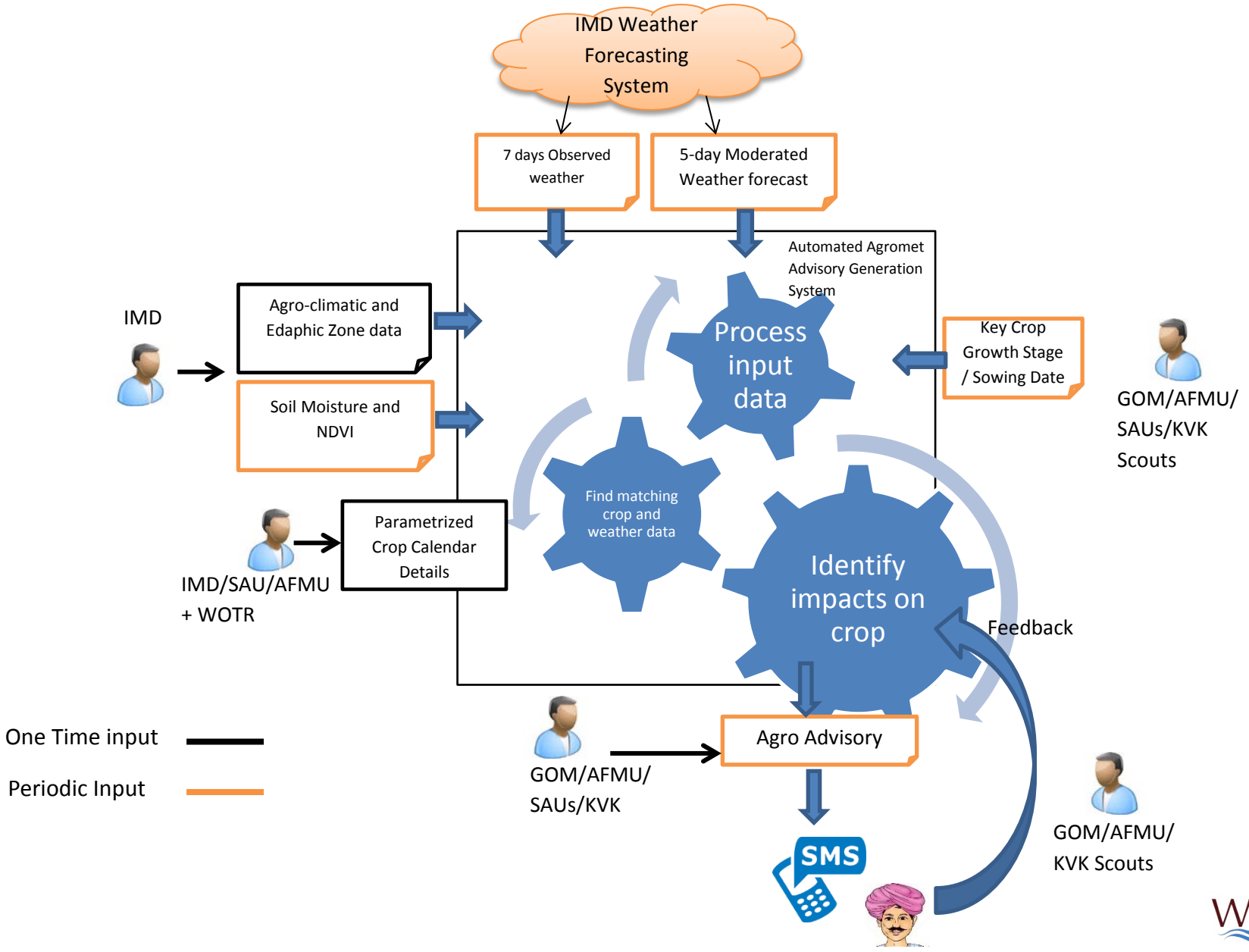
Farmers' Feedback

Locale and Farmer Specific Agro-advisories

User Profiling System (UPS) Recipient /Subscriber details

Multi-channel dissemmination to Farmers: SMS, Wallpapers, Public Address System

Automated Agromet Advisory Generation System



WOTR Centre for Resilience Studies (W-CReS)

- **Purpose:**

  To bridge the gap between science, policy and practice and contribute towards building adaptive and resilience capacities at all levels

- **Objectives:**

  (i) Undertake collaborative and rigorous trans-disciplinary research on the ground;

  (ii) Undertake widespread dissemination of these findings and knowledge products at the local, national and global levels;

  (iii) Build capacities of stakeholders across scales;

  (iv) Contribute to building a "community of learning and practice" across public, private and civil society agencies, at all levels;

  (v) Advocate and lead innovations in adaptation and resilience strengthening policy and practice so that:

  (a) an enabling institutional environment is created and;

  (b) appropriate and adequately resourced adaptation and resilience enhancing programs get efficiently implemented at scale.

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