Social, Ecological and Agricultural Resilience in the face of climate change in the Mediterranean Region (SEARCH)

Toolkit and Resilience Frameworks

SEARCH, affordable water solultions to vulnerable groups: Resilience governance to achieve inclusive communities wellbeing

Egypt, Palestine, Lebanon, Morocco, Jordan

OBJECTIVE

Develop and pilot a resilience framework for local climate action planning capacities and methodologies to increase communities and vulnerable groups resilience through joint learning, planning and participatory testing in demonstration sites

Policy reforms

Sustainable access to clean water to all

APPROACHES

Leaving no one behind
Do not harm
Human rights
Gender
Governance
Efficiency
Intersectoral

- ✓ **Participatory Planning Cycle (PPC) - multilevel framework**
- ✓ **IWRM and Nexus (water-energy-food security)**
- ✓ **Stakeholders sustainable dialogue for concerted actions**
- ✓ **Communities, CSOs and vulnerable groups active involvment: Women, youth, disabled, rural poor, etc**

I. SEARCH RESILIENCE FRAMEWORK

SEARCH/IPCC?

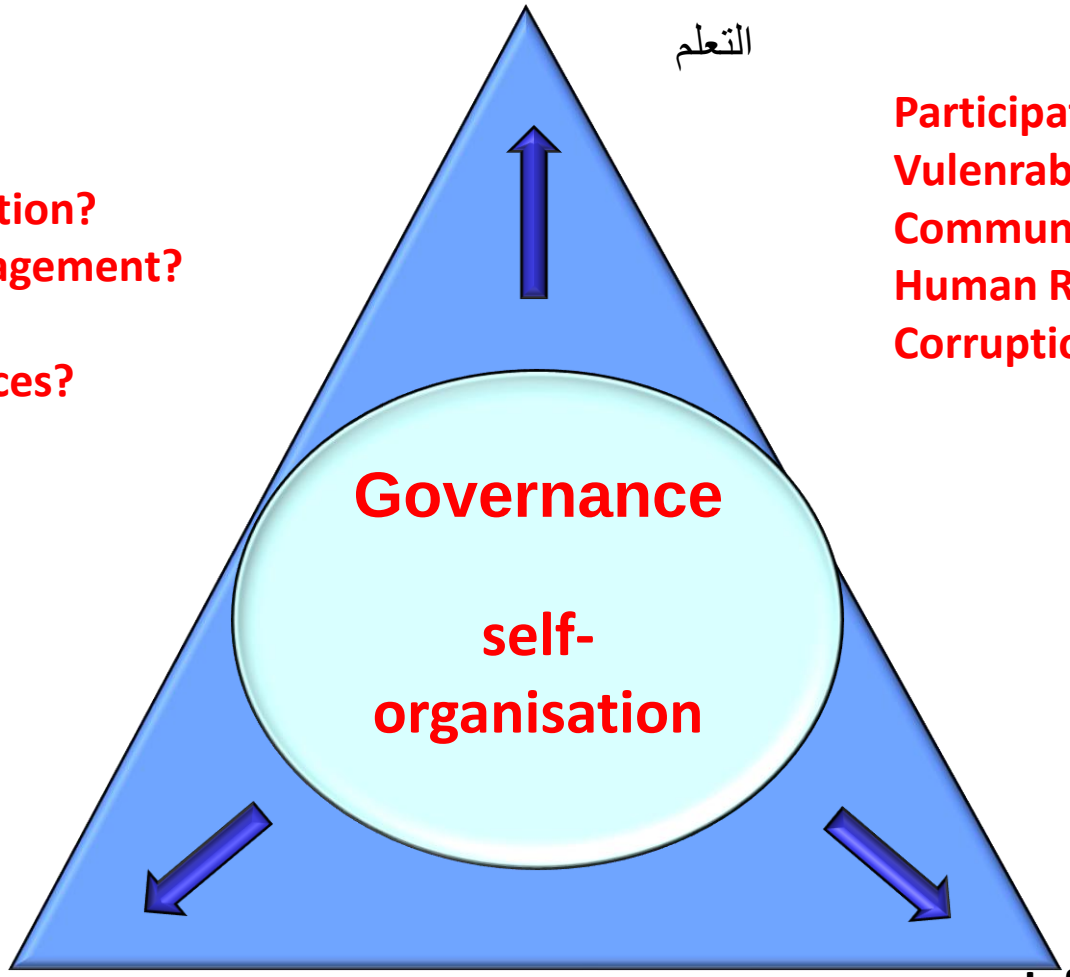
SEARCH

"A watershed system's capacity to absorb, manage, and adapt to social and health, agricultural, and ecological changes (or stressors) while still maintaining its essential structure, feedbacks, and functionality."

IPCC 2008

"The ability of social and ecological system to absorb disturbances while maintaining the same basic structure and functioning. The capacity for self - organization and the capacity to adapt to stress and change".

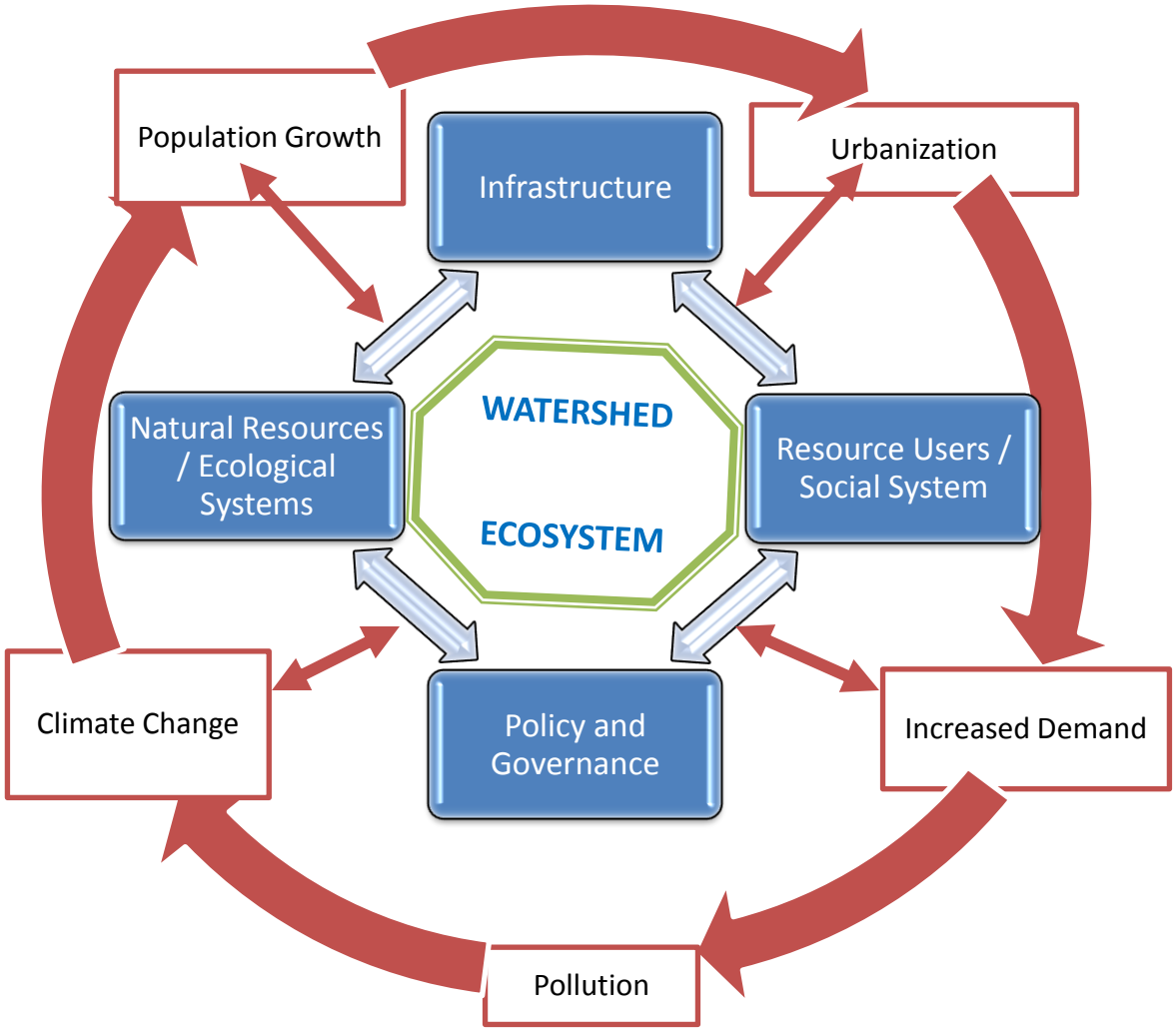
Resilience Framework?



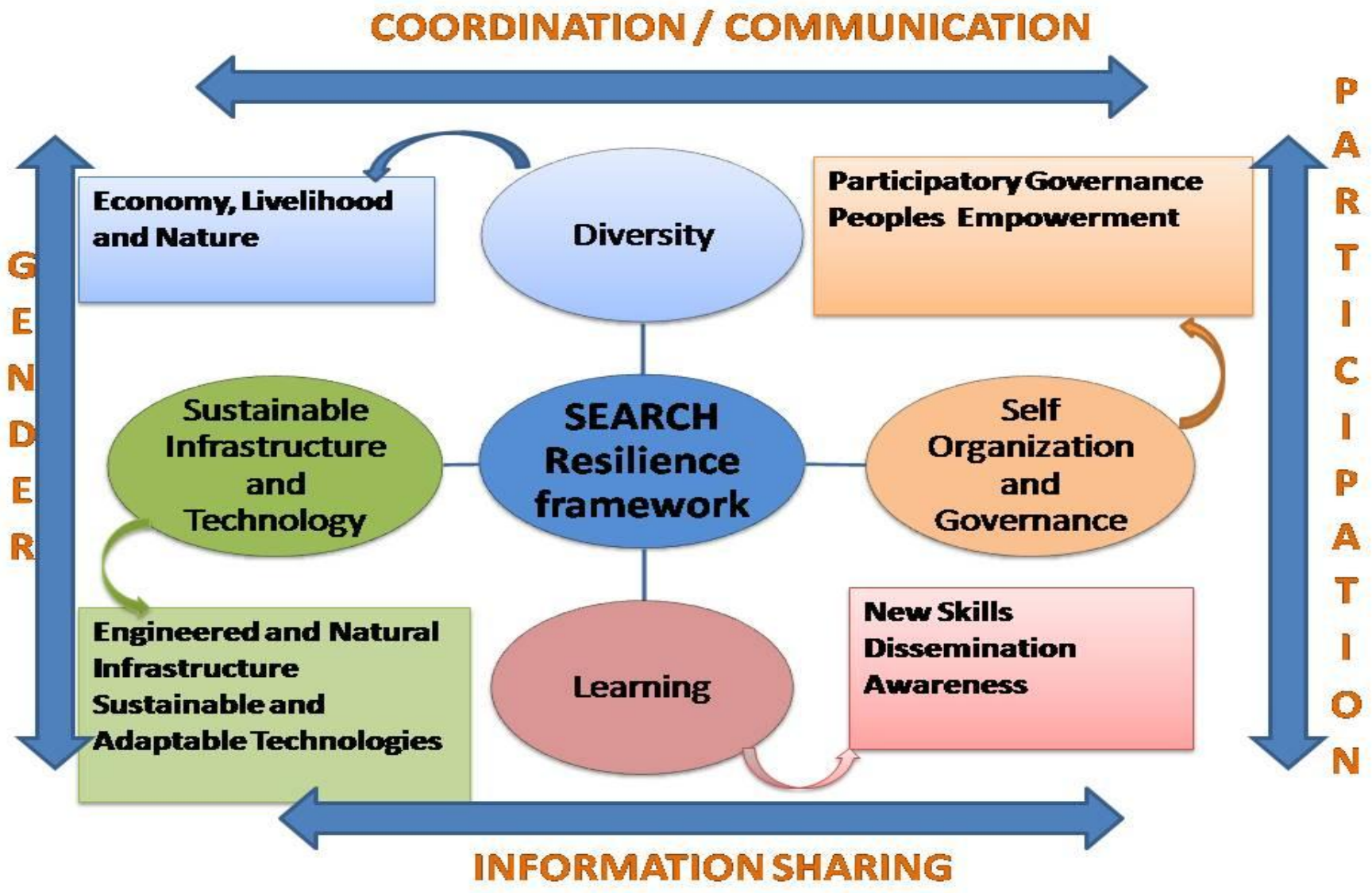
Participation?
Vulenrable groups?
Communication?
Human Rights?
Corruption?

Sectors competition?
Ecosystem Management?
Demands?
Economic balances?
Centralisation?
Nexus?

Resilience Framework?



Resilience Framework?



SEARCH Toolkit / Resilience Framework?

Diversity

- Tools for understanding the system, its diversity, its capacity and its main actors and problems facing it.

Organization and Adaptive Governance

- Tools to define adaptive capacity, governance and organization
- Tools to define system's social, economic and ecological vulnerability

Technology and Infrastructure

- Tools to formulate plans, defining actors roles and responsibilities and define feasibility of various plans.
- Tools to rank and implement the most feasible plans

Learning

- Tools for monitoring evaluation, documentation and feed back

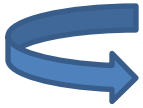
II. SEARCH RESILIENCE TOOLKIT

Toolkit: Aim?

To provide practical guidance and recommendations on how to develop climate change resilience strategies and plans at local, sub-national and national levels

Toolkit : Use?

- Conduct stakeholder analysis and gather data on views and perceptions of local communities,
- Identify causes and effects of climate change,
- Assess vulnerabilities and resilience options of social and ecological systems,
- Develop and prioritise climate resilience plans,
- Provide a solid knowledge base for decision making,
- Link theory with practice, research with application.



Climate Governance

! Leaving no one behind, human rights based, gender, vulnerable groups participation

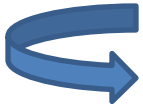
Toolkit : Added value?

- **Practical tools for guiding various practitioners, planners and decision makers on Resilience Mainstreaming**

➡ **National, local and watershed levels**

- **Flows of activities ➡ practical steps**

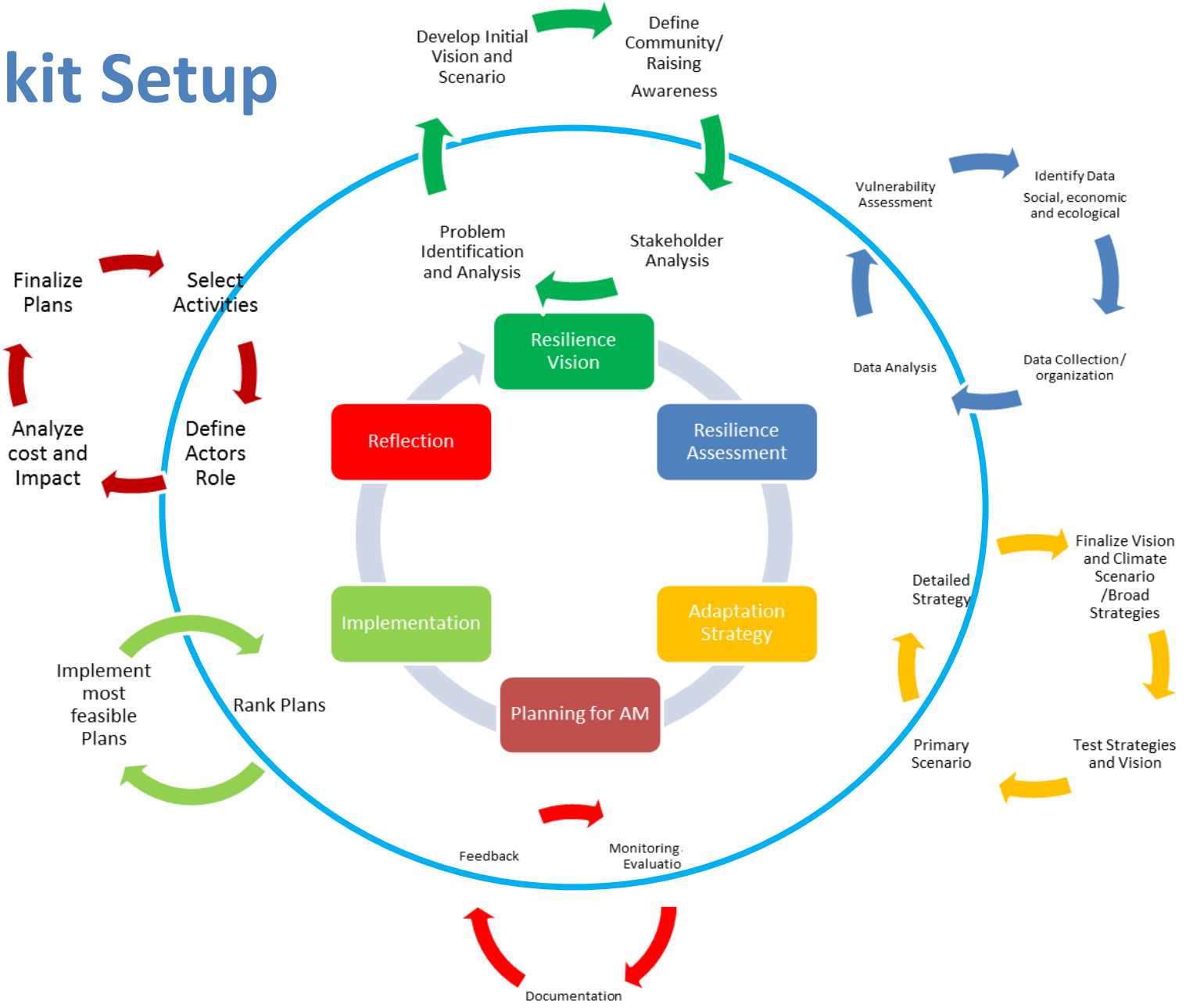
➡ **Interlinkages**



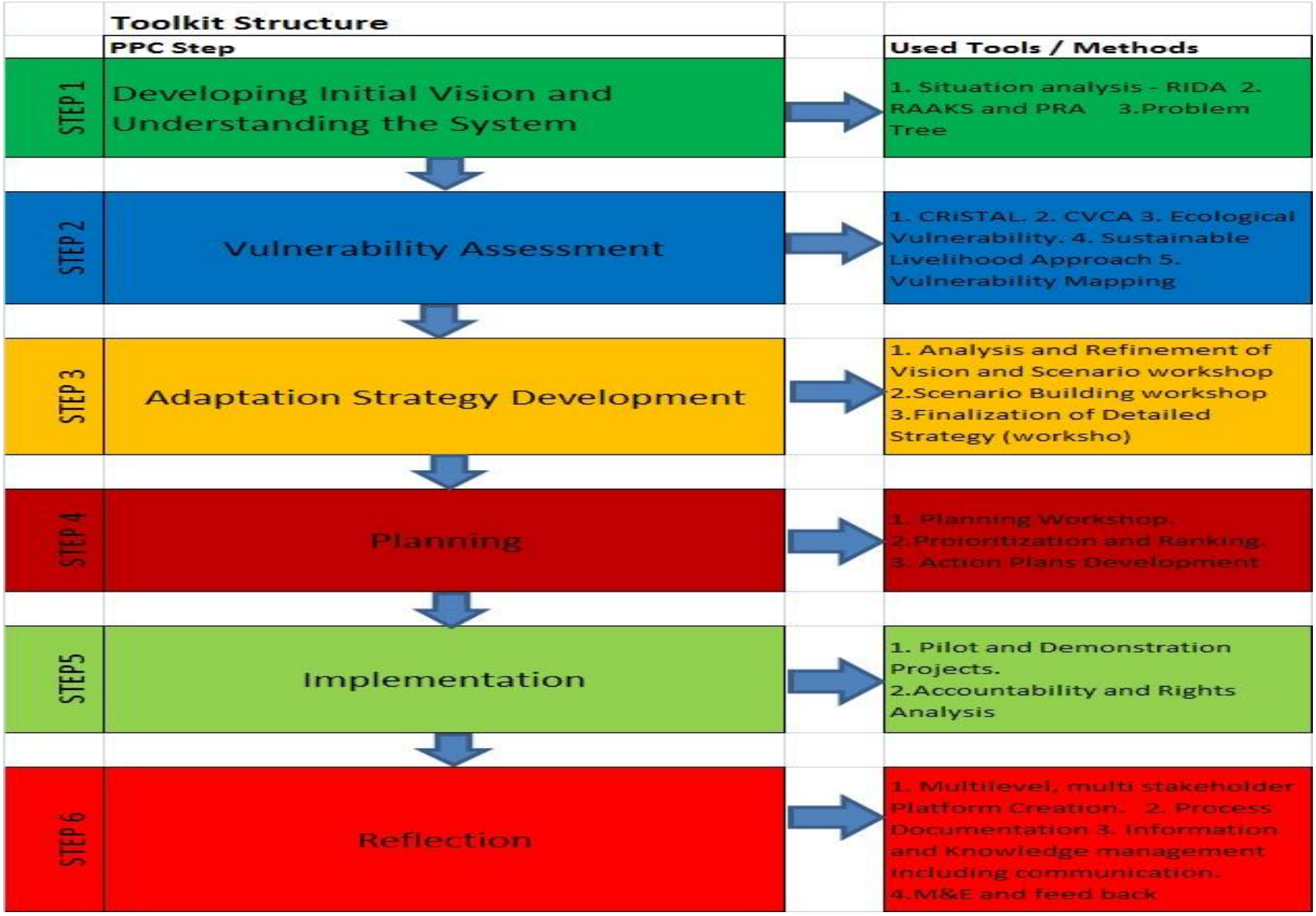
INTEGRATED RESLIENCE

! Vulnerable groups rights and real needs: women, youth, unemployed, farmers, poor, elderly, disabled..

Toolkit Setup

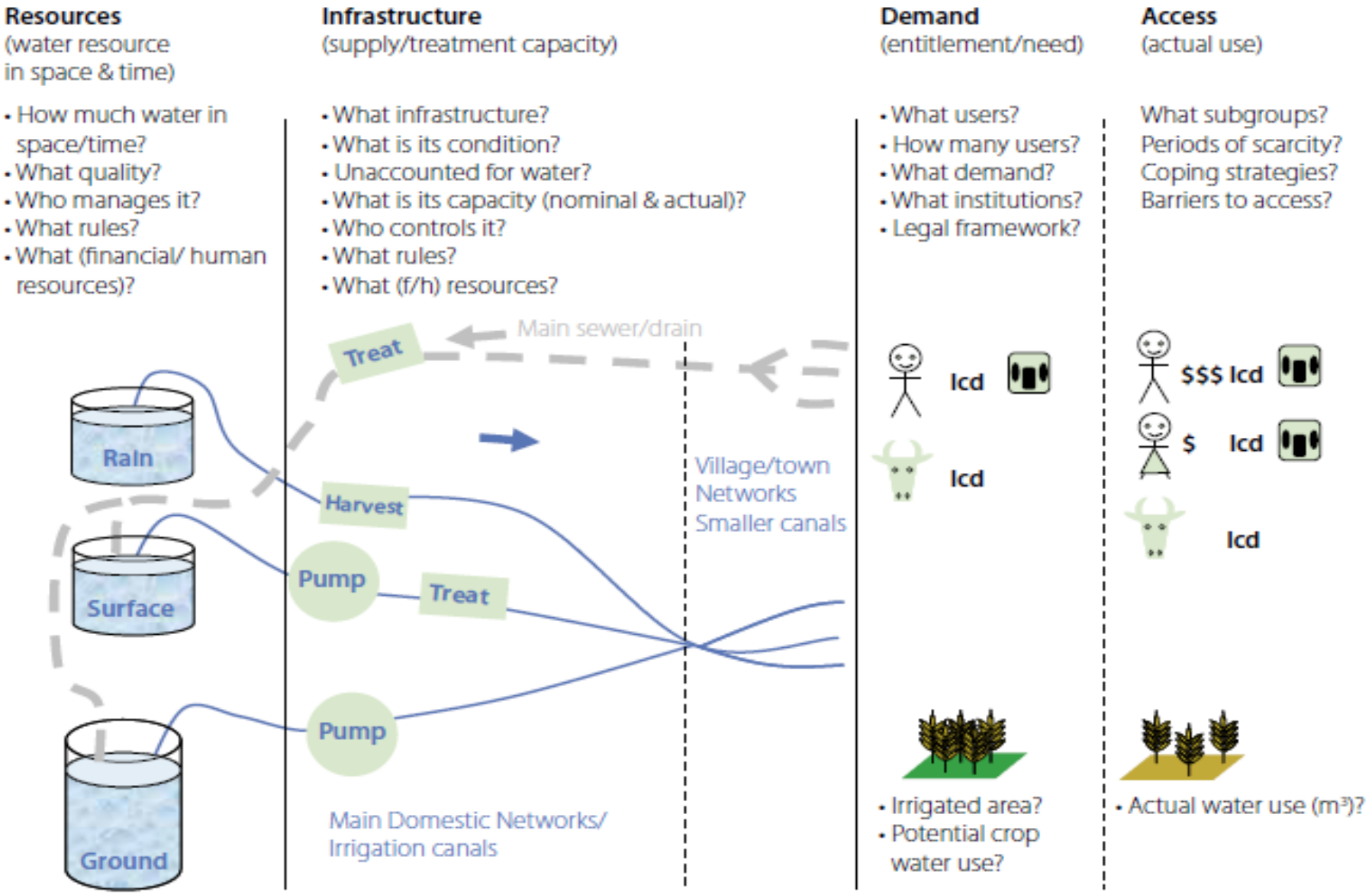


Toolkit : Structure?

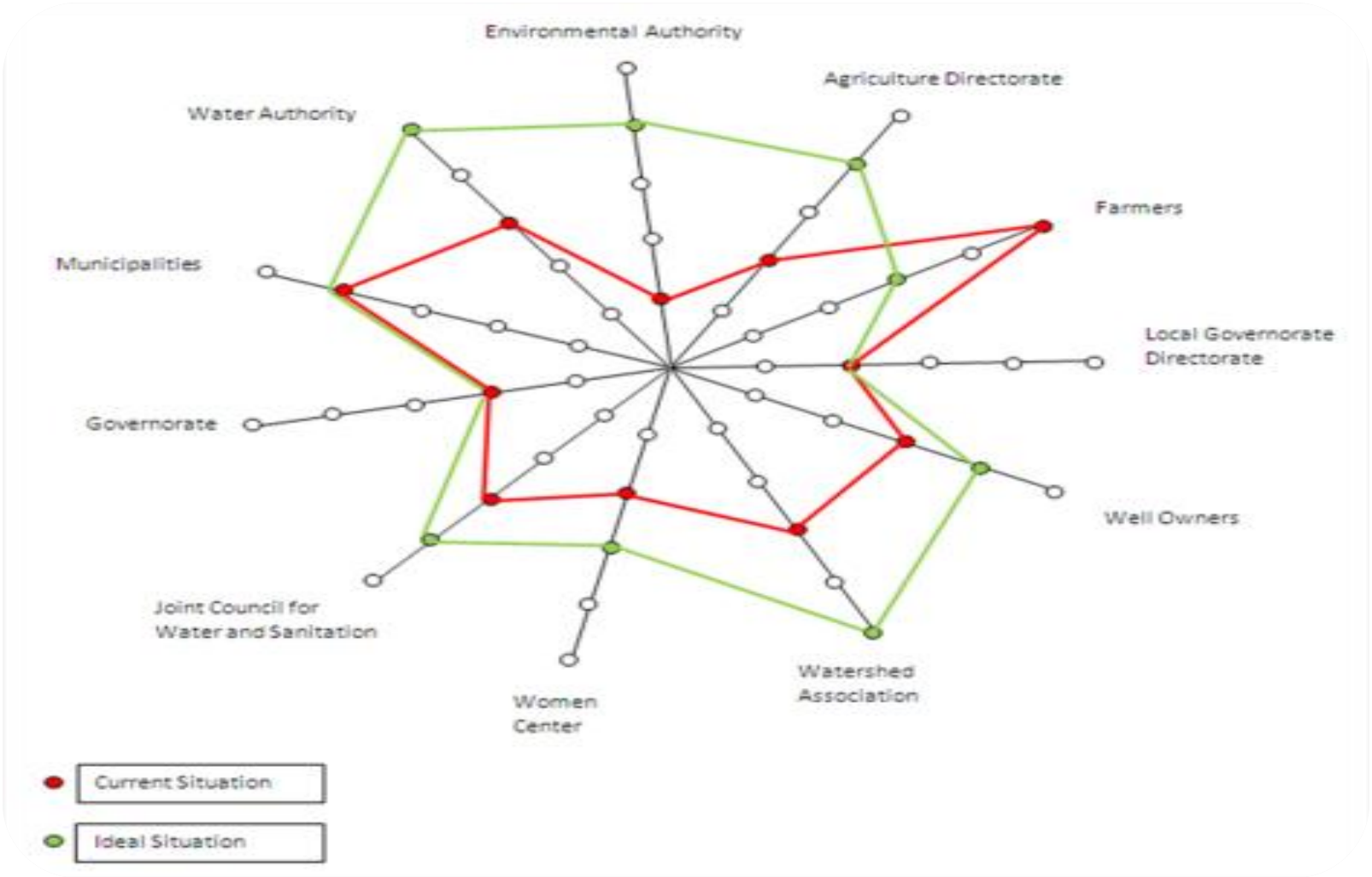


S1 - UNDERSTANDING THE ECOSYSTEM: TOOLS

Resource and Capacity Assessment Tool - RIDA



Stakeholder Analysis Tools - PRA & RAAKS



STAKEHOLDERS COORDINATION

Stakeholder Analysis Tools - PRA & RAAKS

	Stakeholder	11	10	9	8	7	6	5	4	3	2	1
1	Farmers	1-	2+	2+	1+	2-	+ -	2+	2+	2-	2+	....
2	Agriculture Directorate	2+	2-	2+	1+	2-	2+	2+	2+	+ 2	....	....
3	Environmental Directorate	2+	2-	2-	1-	2+	2+	2+	2+	....	....	....
4	Water Authority	2+	2+	2+	1-	2+	2+	2+	....	....	....	....
5	Municipalities	2+	1+	2+	2+	2+	2+	....	....	....	....	....
6	Governorate	2+	1+	+ -	2+	2-	....	....	....	....	....	....
7	Joint Council for Water & Sanitation	2+	1-	+ -	2+	....	....	....	....	....	....	....
8	Women Centre	1+	1-	2+	....	....	....	....	....	....	....	....
9	Watershed Association	1+	2+	....	....	....	....	....	....	....	....	....
10	Well Owners	1-	....	....	....	....	....	....	....	....	....	....
11	Local Governorate Directorate		....	....	....	....	....	....	....	....	....	....

- Defining Actors
- Linkage and Relation Analysis

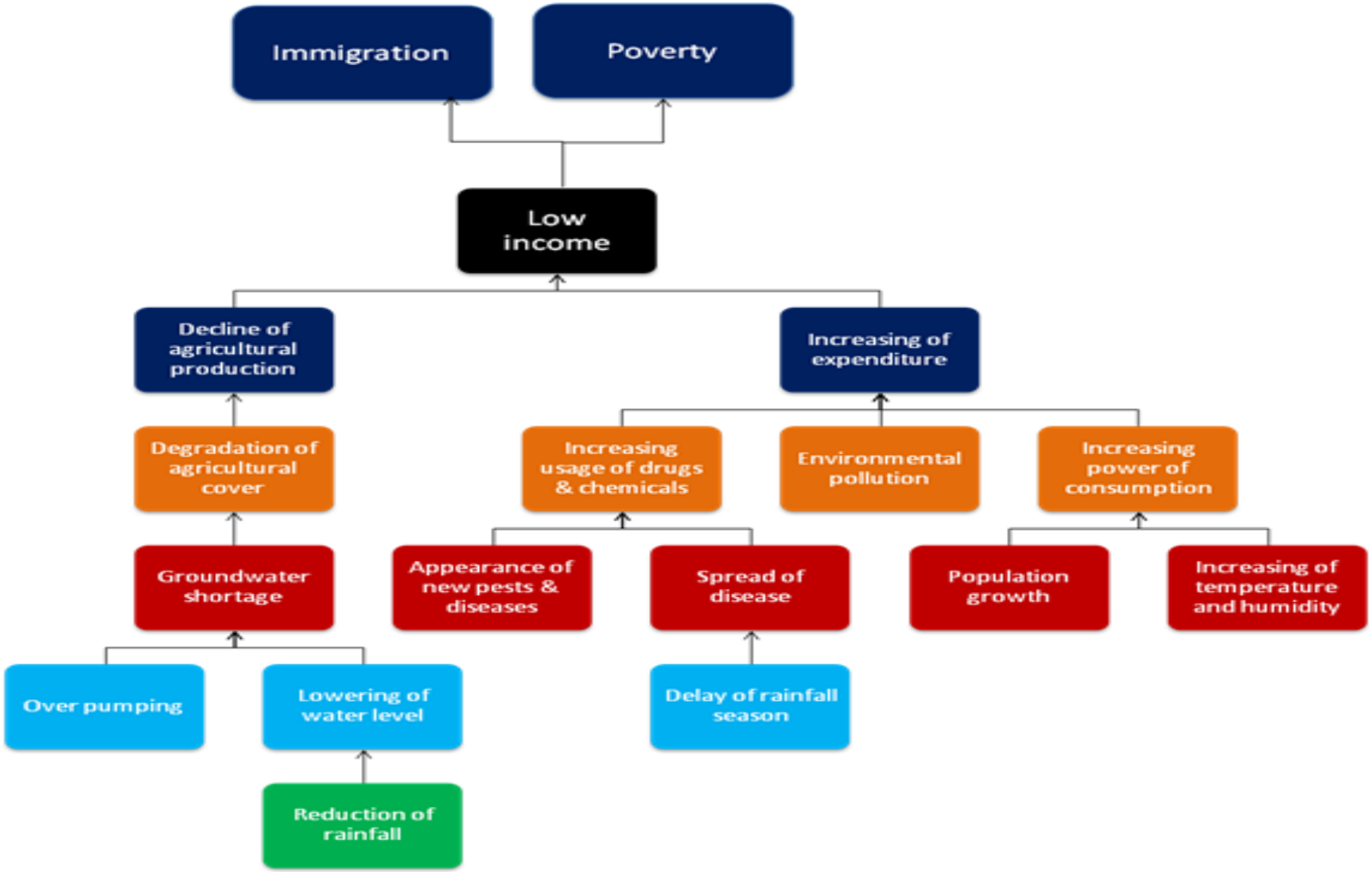
Stakeholder Analysis Tools - PRA & RAAKS

Problem definition exercise	Window: A1
Actor identification exercise	Window: A2
Actor objective sheet	Window: A3
Environmental limits checklist	Window: A4
Prime mover septagram	Windows: A5/B6
Approximation exercise I	Windows: A5/B8
Approximation exercise II	Window: A5

Impact analysis sheet	Window: B1
Actor analysis checklist	Window: B2
Info–source–use exercise	Window: B3/a
Communication network sheet	Window: B3/b
Source–intermediary–user sheet	Window: B3/c
Linkage matrix	Window: B4/a
Linkage mechanism checklist	Window: B4/b
Task analysis sheet	Window: B5
Basic configurations	Window: B6
Communication analysis exercise	Window: B7
Window reporting sheet	Window: B8/a
Understanding the social organization of innovation	Window: B8/b

Knowledge management analysis exercise	Window: C1
Actor potential checklist	Window: C2
Defining possible actions	Window: C3/a
Strategic commitments	Window: C3/b

Problem Identification and Analysis : Problem Tree



S2 - VULNERABILITY ASSESSMENT TOOLS

Community-based Risk Screening – Adaptation and Livelihoods (CRiSTAL) Tool

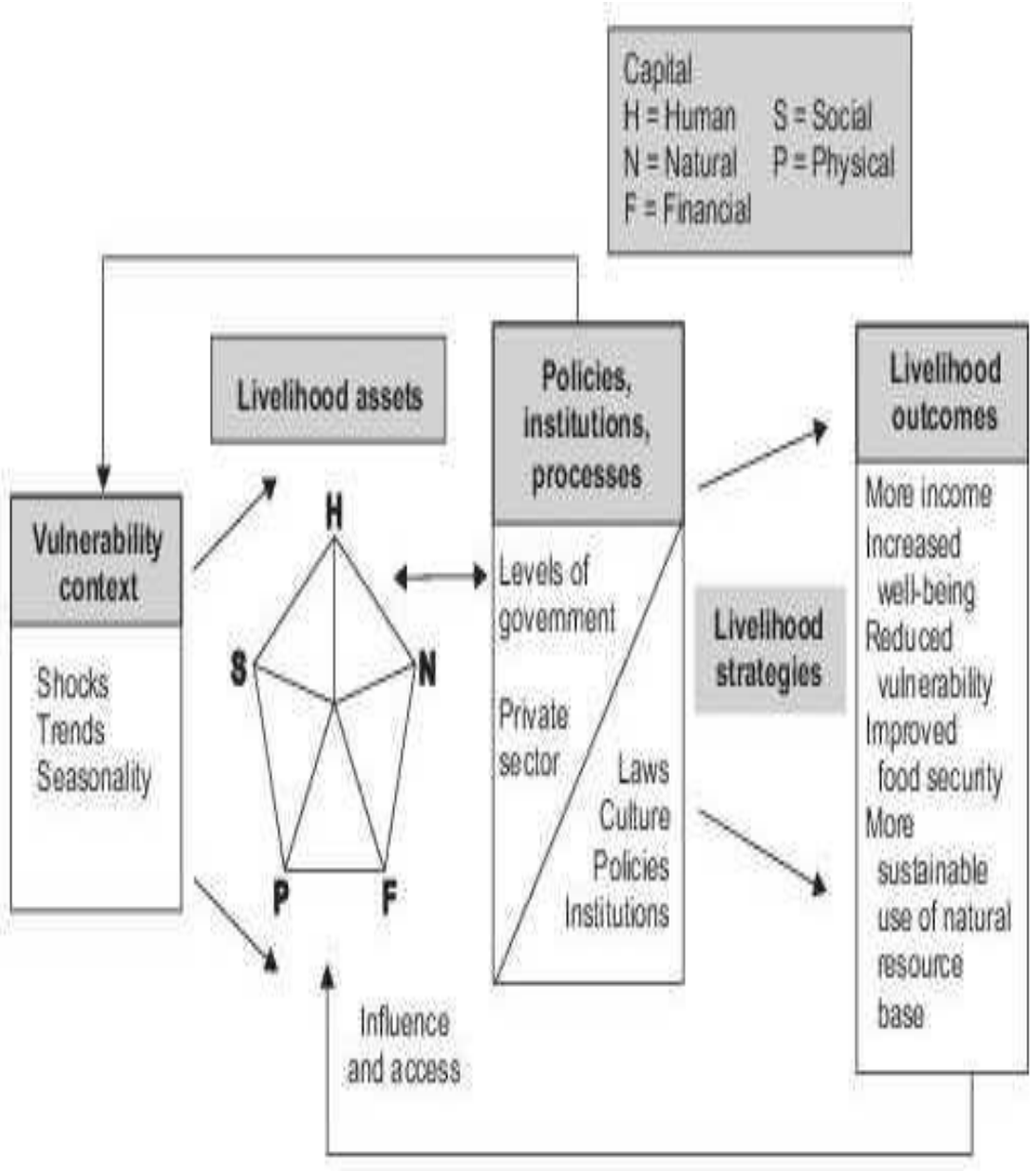
Affected area/ sector	Event(hazards)	Vulnerability Assessment of the watershed			
		Exposure	Degree of Sensitivity of the System	Degree of the adaptive capacity	Vulnerability of the area
Downstream area	Flood	High-As a closed watershed, runoff water from hilly areas drains to and accumulates in the downstream area.	High-The downstream area is very sensitive to flood.	Low-Suggested adaptation measures can only upgrade the system partially, and these options are costly.	High
Water resources	Drought	High-Groundwater that forms the main water source is directly affected by the amount of precipitation.	High-Summer water needs already greater than production, and groundwater abstraction faced by many regulatory problems.	Medium-There is an ability to regulate groundwater exploitation. Some upgrade measures adopted by now but are not enough.	High
Plantation area and infrastructure	Frost wave	Medium-The area suffers repeatedly from frost wave in winter months causing severe impacts on the area.	Medium-Impacts magnitude and affected areas change from year to year.	Low- Some upgrades already adopted, but need modifications. Negative impacts mostly limited to some crops.	Medium
	Wind storm	Medium-Unpredicted windstorms mostly cause damage of crops, and infrastructure.	Medium-There is an ability to upgrade the system by improving the system itself, but it is considered costly for some people.	Medium-Some modifications can be implemented to reduce the impacts.	Medium

Ecological Vulnerability Assessment Tool

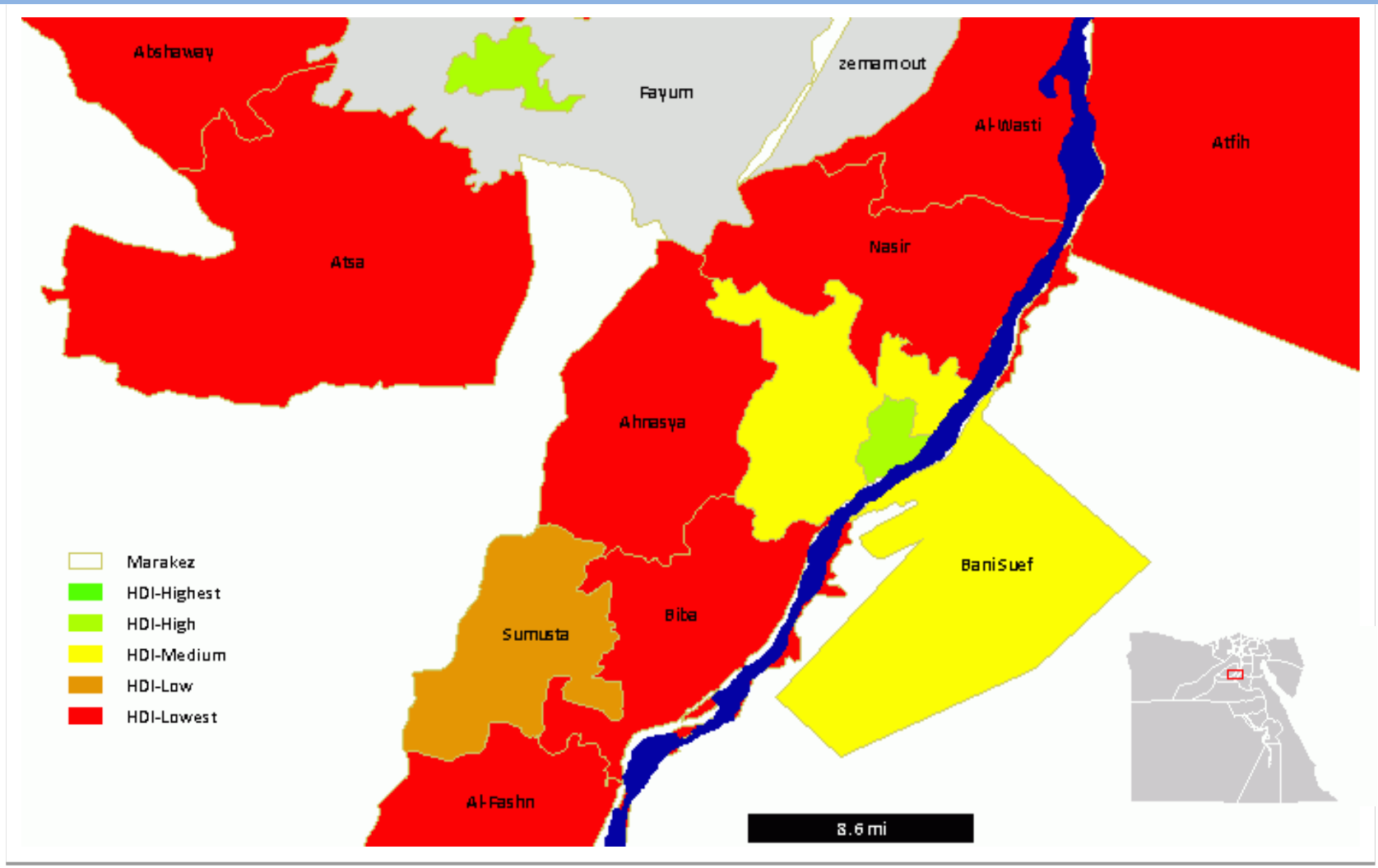
KARMCHBAT	Climatic factors		Anthropogenic factors				Other		
Stress factor	Decreased precipitation	Increased temperature	Grazing	Logging	Hunting	Agriculture and urban expansion	Soil erosion	Forest fire	Phytopathology
Exposure	M	M	H	M	M	L	L	L	M
Sensitivity	L	M	H	H	M	M	H	L	H
Impact	M	M	**H**	M	M	M	L	L	M
Adaptive capacity	M	M	L	M	L	L	M	H	M
Vulnerability	M	M	**H**	M	M	M	M	L	M
Resilience	M	M	**L**	M	M	M	M	H	M

Sustainable Livelihoods Approach (SLA)

	High temperature and low precipitation		
Livelihood Assets	**Andaket**	**Aydamoun/ Karmchbaa t**	**Qoubyat**
Human Capital			
Education Level	**High**	**Medium**	**High**
Poverty Level	**Low**	**High**	**Low**
Income	**Medium**	**Low**	**Medium**
Access to Health Services	**Medium**	**Medium**	**High**
Awareness Level	**Medium**	**Low**	**Medium**
Natural Capital			
Dependency on Agriculture	**Low**	**High**	**Low**
Dependency on Water Resources	**High**	**High**	**High**
Dependency on Livestock	**Low**	**High**	**Low**
Dependency on the Forest	**High**	**High**	**Medium**
Physical Capital			
Ownership of House	**Yes**	**Yes**	**Yes**
Ownership of Land	**Yes**	**Yes**	**Yes**
Presence on Vehicles	**Yes**	**Yes**	**Yes**
Presence of House Electronics	**Yes**	**Yes**	**Yes**
Social Capital			
Participation in the House	**High**	**High**	**High**
Membership in Local Societies	**High**	**Medium**	**High**
Financial Capital			
Dependency on Retirement	**High**	**Medium**	**High**
Dependency on Employment Salary	**High**	**Medium**	**High**
Trade	**High**	**High**	**High**



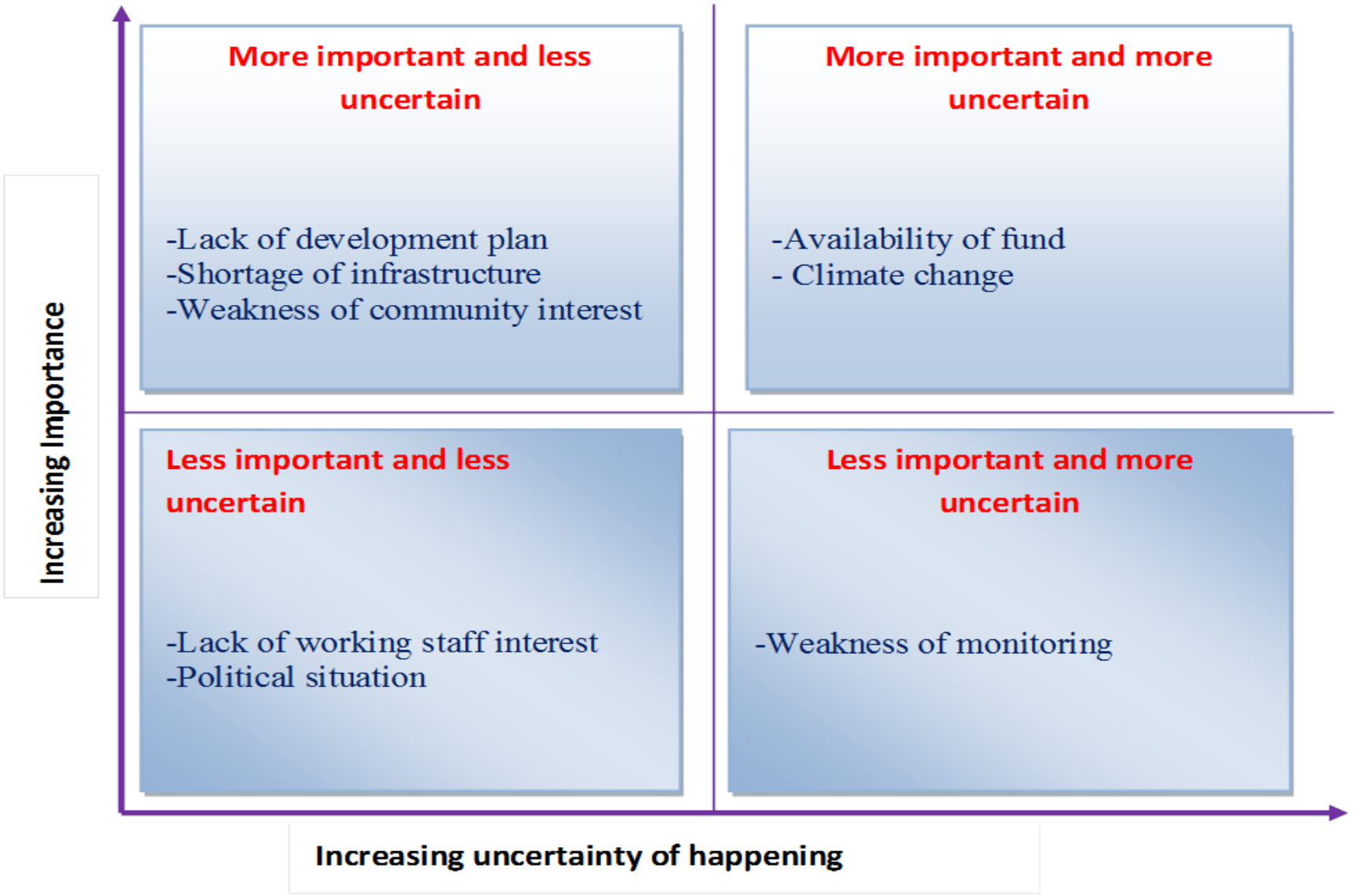
Vulnerability Mapping Tool



- areas marked with red colour shows the lowest HDI ranked areas.

S3 - ADAPTATION STRATEGY DEVELOPMENT : TOOLS

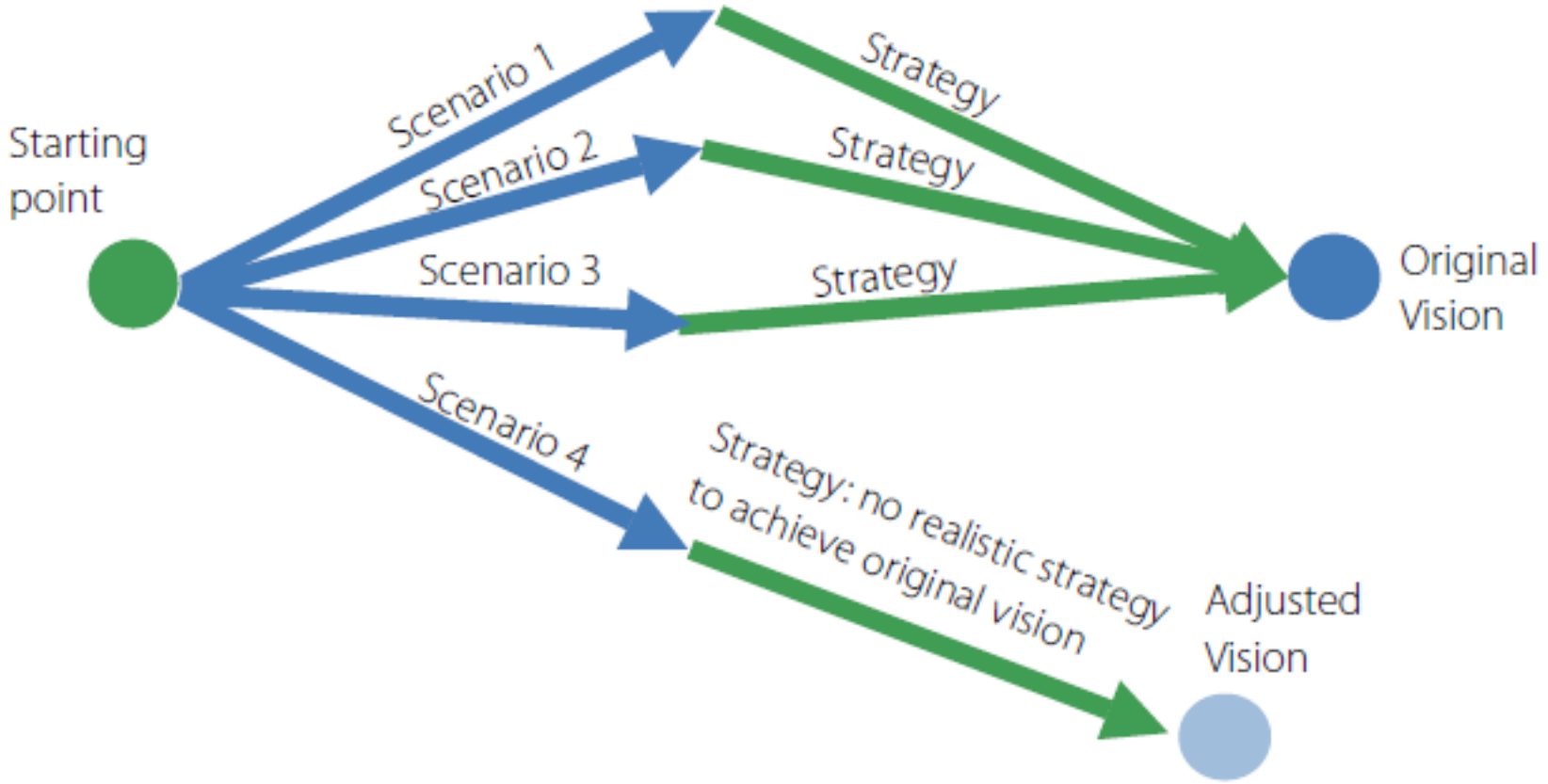
Visioning


More important and less uncertain
-Lack of development plan
-Shortage of infrastructure
-Weakness of community interest
More important and more uncertain
-Availability of fund
- Climate change
Less important and less uncertain
-Lack of working staff interest
-Political situation
Less important and more uncertain
-Weakness of monitoring
Increasing Importance
Increasing uncertainty of happening

Scenario Building

Scenarios
Divergent futures based on possible trends in external factors

Strategies
Broad groups of activities to achieve a vision under different scenarios



Finalisation of Detailed Strategy

Activities	Scenarios		
	S1	S2	S3
Mobilizing community resources to adapt to climate change	√		√
Involving private sector in the activities to adapt to climate change.	√		√
Establishing partnerships with donors in order to fund projects that strengthen farmers to adapt to climate change.	√		√
Projects to manage solid and liquid wastes in all villages of the district.		√	√
Producing bio fertilizers using agricultural wastes.	√		√
Follow the Crop rotation (which organizes the process of cultivating)	√	√	√
Provision of crop varieties adapt to the effects of climate change (high temperature and water shortage).	√	√	√
Preventing encroachment on agricultural land.	√	√	√
Laser leveling	√	√	√
Developing new varieties of crops, high production and provision of these crops in the agricultural cooperative associations.	√	√	√
Soil improving.	√	√	√
Windbreaks in the areas near desert	√	√	√
Apply balanced fertilizing programs to face climate change impacts	√	√	√
Distribution of accredited seeds and crops	√	√	√
Recycling of agricultural wastes	√	√	√
Cultivating Moringa tree rather than decorative plants in order to benefit from the economic, nutrition and health value and rationalize water consumption.	√	√	√
Raising awareness and train farmers on adapt to climate change, through farm management, appropriate cultivation time, agricultural processes including plowing, irrigating, fertilizing and combat pests and diseases.	√	√	√
NGOs do follow-up and monitoring of climate change and the exchange of data with the stakeholders in order to be analyzed and develop solutions.	√	√	√

S4 - PLANNING TOOLS

The plan

- ACTIVITIES ?
- STAKEHOLDERS?
- IMPLEMENTER/S?
- RESOURCES:HUMAN?FINANCIAL?TECHNICAL?
- SCHEDULE?
- MONITORING AND EVALUATION?

Prioritisation and Ranking

Ranking

Weight			1	2	3
Criteria		Rating Scale	Project1	Project2	Project3
Social	Job creation	1			
	Health impact				
Economical	Expected Revenue	2			
	Cost				
Environmental	Pollution	3			
	Preserving	4			
Technical	Technology	5			

Prioritisation and Ranking

Prioritization Matrix

Project	Need of local communities	Constraints	Budget estimate (USD)	Source of financing	Priority
	High	- -	28,000	SEARCH	1
1	Medium	- - -	20,000	Fundraising	2
2	Medium	- - -	35,000	Fundraising	3
3	Low	- -	25,000	Fundraising	4

S5 - IMPLEMENTATION TOOLS

Accountability and rights analysis

Pre-Conditions for Success or Failure of accountability at the community level	Ok	Mid	Slight	Low
Awareness/Capacities & knowledge	Local community has capacity & skills to adapt to climate change	People are aware of problem & have the ability to rank priorities	Local community is aware of the available resources with capacities to identify problems	Local community is aware and have knowledge of their natural situation
Benefits	Take into consideration the needs of various social groups	Understanding the different interest & rights of various social groups “farmers, women, poor”	Address rights and interest of others in the community	Identify individual interest (benefits, revenue) regarding natural resources
Access Rights and Control	Group accountability to government authorities for respecting their rights toward natural resources	Local community accountability towards respect for the right of different social groups “farmers, women poor”	Rights and roles of different community groups are addressed	Dominant groups have access according to rights
Community Leadership	Responsible leadership activities accepted by local community	Organized groups can promote voluntary work & advocate rights	Identify Potential Groups to promote a collective work “voluntary work”	Address individual leaders among local community
Group process	Organized groups have the ability and capacity to claim benefits	Consider social diversity within organized groups	Identify various social group in forming organized groups	Organized group include dominant sector only

S6 - REFLECTION TOOLS

The plan?

- **Multi-level, multi-stakeholder platform creation**
- **Process documentation**
- **Information and knowledge management including communication**
- **M&E and Feedback**

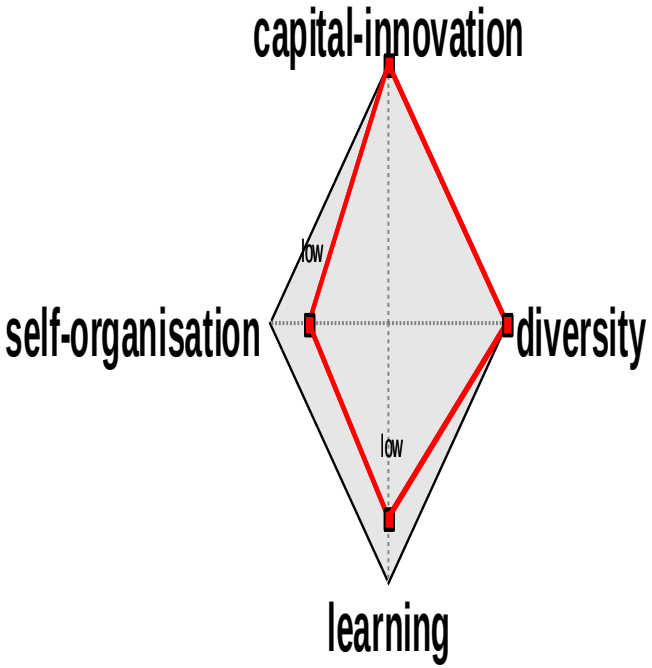
Resilience Assesment?

- **Methodology based on qualitative multi-attribute modelling supported by the DEXi software.**
- **Final goal is to help monitoring and assessment of resilience by identifying and characterizing positive change (the shift) when this occurs.**
- **Cconsistency and flexibility**

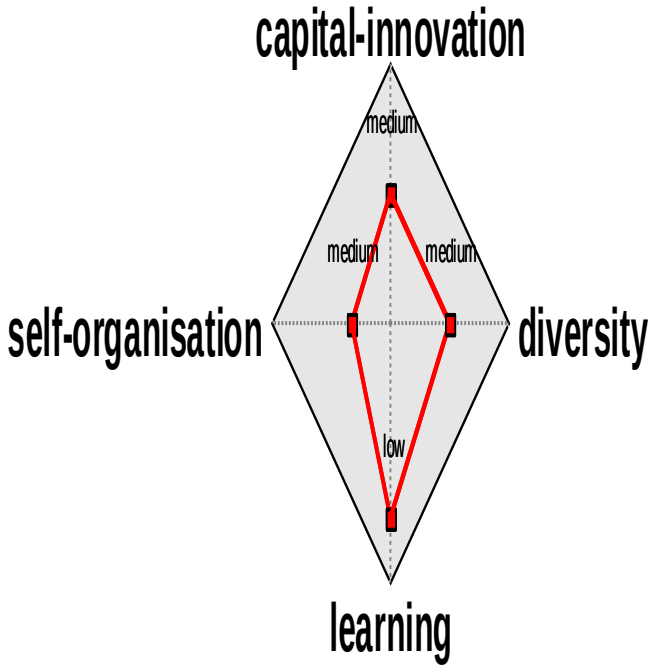
Resilience Assesment : Dexi outcome?

Components of Resilience that have changed

Resilience before project



Resilience after project



III. RESILIENCE STRATEGY IN ACTION Examples from SEARCH

Resilience Strategising?

Diversity Strategy

- **Re-use of drainage and treated waste water, an example of 'diversity in resources'**
- **Use of agricultural modern methods that save water and increase productivity**
- **Select new or native varieties of crops tolerant to severe climate events**
- **Mobilise indigenous community resources**
- **Improve veterinary care**

Resilience Strategising?

Self Organization and Governance Strategy

- Coordination between sectors to achieve policy coherence
- Public Participation in planning / sustainable dialogue between stakeholders and communities
- Integrated water resources management (IWRM)
- CSOs and Water Users Associations active consultation
- Transparency
- Accountability

Resilience Strategising?

Sustainable Infrastructure and Technology Strategy:

- **Low cost technology applications for water saving, renewable energy, sustainable agriculture and food security**
- **Soil improvement and protection from desertification**
- **Green infrastructure in the government plans**
- **Private sector investments in sustainable infrastructure and technology**

Resilience Strategy in practice?

Learning Strategy

- **Education, capacity building and awareness raising to all, especially farmers and communities**
- **Access to data and information dissemination**
- **Support agricultural extension departments**
- **Involve schools**

Resilience: from theory to action?

Pilot Project : Farmer field schools in El-Masharka and Mayana villages, Egypt

- **Agricultural Extension / Agricultural directorate in Beni Suef**
- **Transfer messages and knowledge to target farmers**
- **Awareness on adaptation to climate change / agriculture**
- **Evaluation: Knowledge level**

From 68% to 94%

26% progress in knowledge level

Resilience: from theory to action?

Pilot project: Sustainable technology for water solutions in Marj Sanour, Palestine

! **Droughts and floodings : water shortage, water quality drop**

Stakeholders suggested solutions

Water Harvesting
Reclamation and rehabilitation of land
Groundwater Artificial Recharge

Select best available technology

- **Suitable to local conditions**
- **Easy to operate and maintain**
- **Low cost or affordable by users**
- **Culturally and socially acceptable**
- **Easy adopted and scaled up**
- **Environmentally safe**
- **Low energy requirements**

Implemented actions

- **Six boreholes were drilled, average recharge capacity 20000 m^3/day**
- **Constructing earth pools to store flood water**
- **Rehabilitating the mountainous lands to reduce runoff and erosion**

THANK YOU

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