TRANSECT

Centre for Econics and Ecosystem Management

Hochschule für nachhaltige Entwicklung Eberswalde

GEFÖRDERT VOM
Bundesministerium für Bildung und Forschung

A participatory systems approach to agrarian change: Insights from workshops with farmers in Pakistan

PART II - Strategies

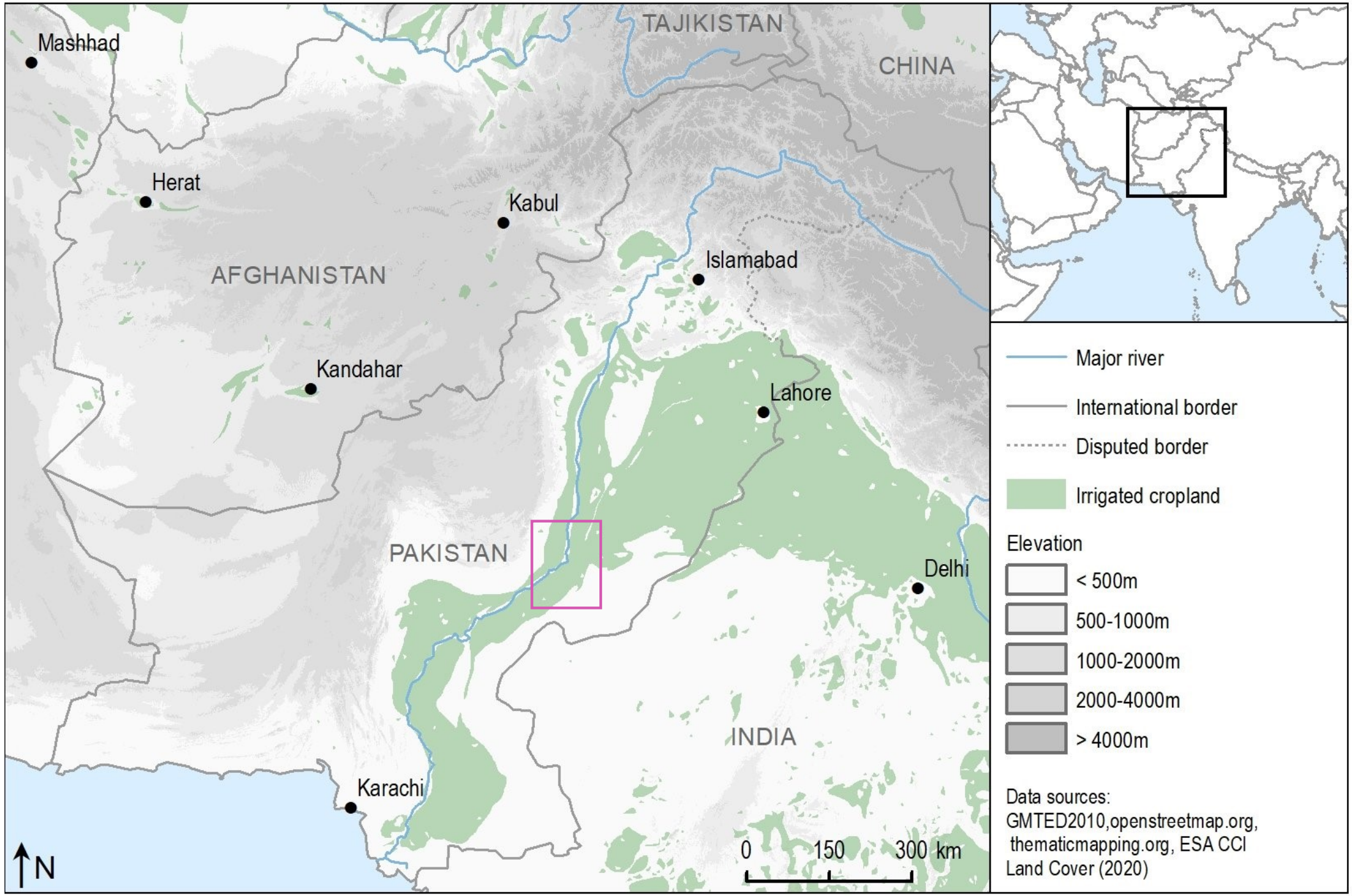
GCM lecture, 21 March 2025 Michael Spies & Mehwish Zuberi

Previously discussed:

Case study Pakistan:

The Bt cotton crisis

Photo: M. Zuberi 2020


TAJIKISTAN
CHINA
Mashhad
Herat
Kabul
Islamabad
AFGHANISTAN
Kandahar
Lahore
PAKISTAN
Delhi
INDIA
Karachi
N
0
150
300 km
Major river
International border
Disputed border
Irrigated cropland
Elevation
< 500m
500-1000m
1000-2000m
2000-4000m
> 4000m
Data sources:
GMTED2010,openstreetmap.org,
thematicmapping.org, ESA CCI
Land Cover (2020)

What actors, processes and structures determined the spread of Bt cotton in South Punjab and its outcomes?

What were the consequences for local farmers, and how were these consequences shaped by the particularities of the social-ecological context?

Photo: M. Zuberi 2021

The Bt cotton crisis is a consequence of the interplay of complex social-ecological factors

Global processes have local outcomes

Local structures and powere asymetries shape the outcomes of technologies and agrarian strategies

Photo: M. Zuberi 2021

Recap: Adapted MARISCO method & situation analysis results in Pakistan

Background

- Application of adapted MARISCO-workshops in three case study areas in 2022/23
  - Jaloliddin Balkhi & Khuroson District, Tajikistan
  - Panfilov district, Kazakhstan
  - Multan district, Pakistan

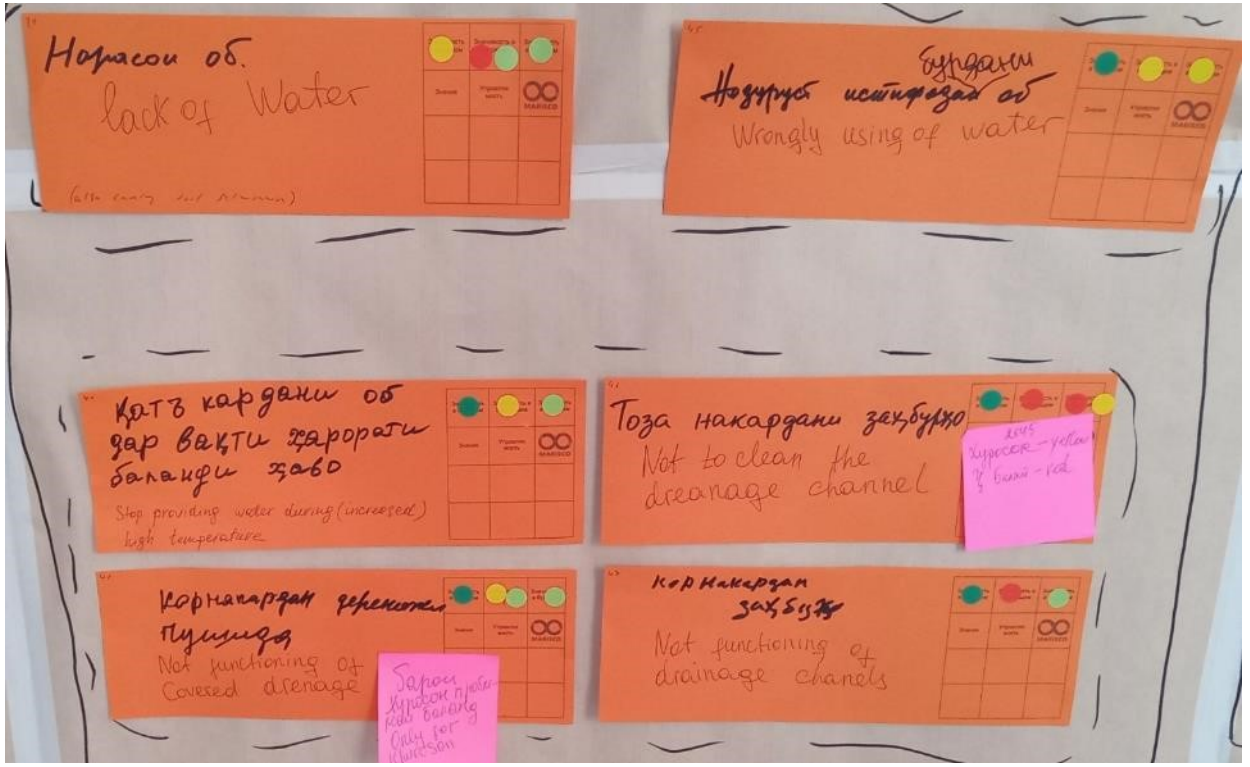
→Series of 2 participatory workshops

→Separate workshops with female participants

Photos by TRANSECT team, 2022-23

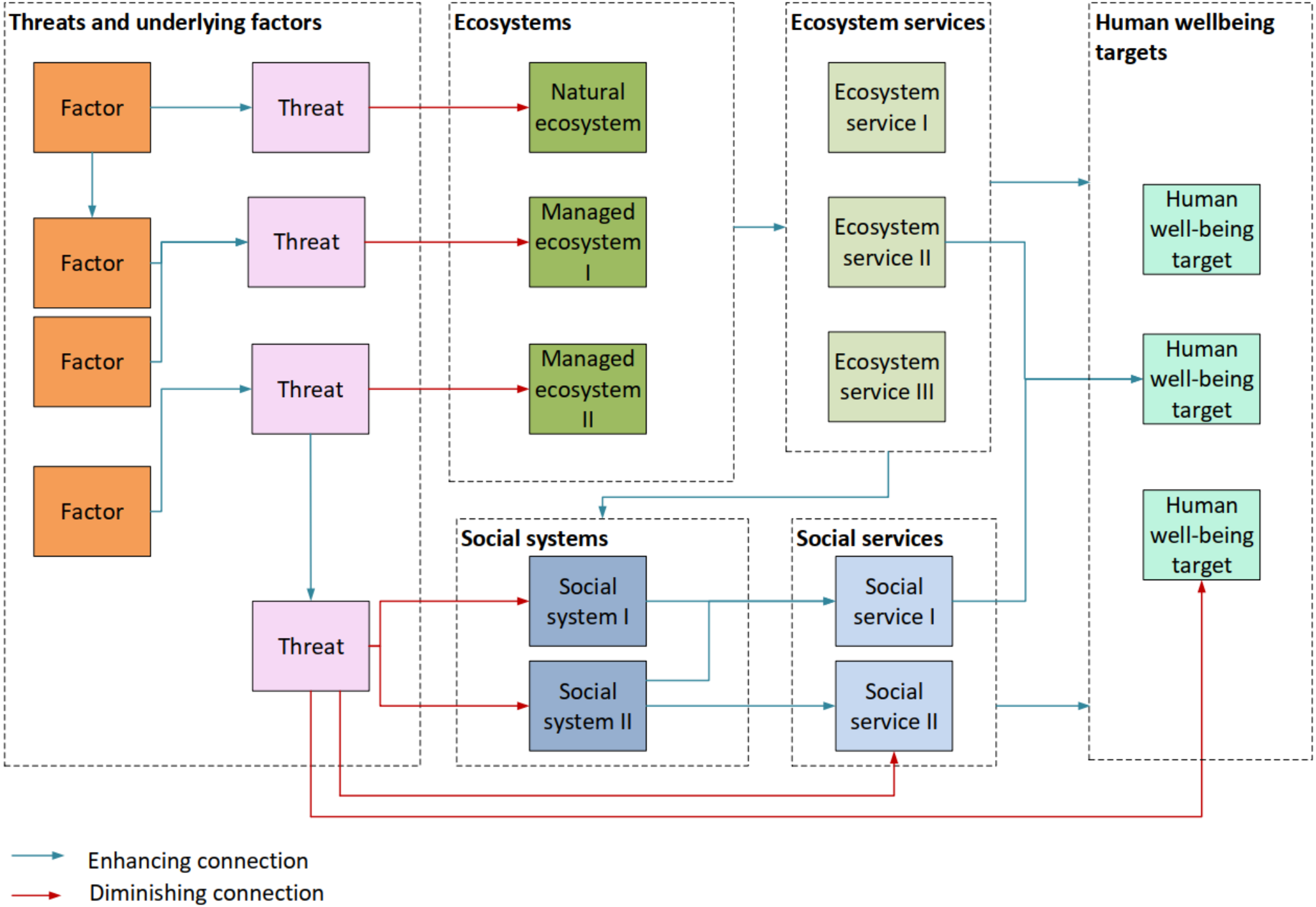
Part I
Workshop I: Systemic situation analysis

- Creating knowledge map or ‘conceptual model’
- Systematic evaluation of threats & factors



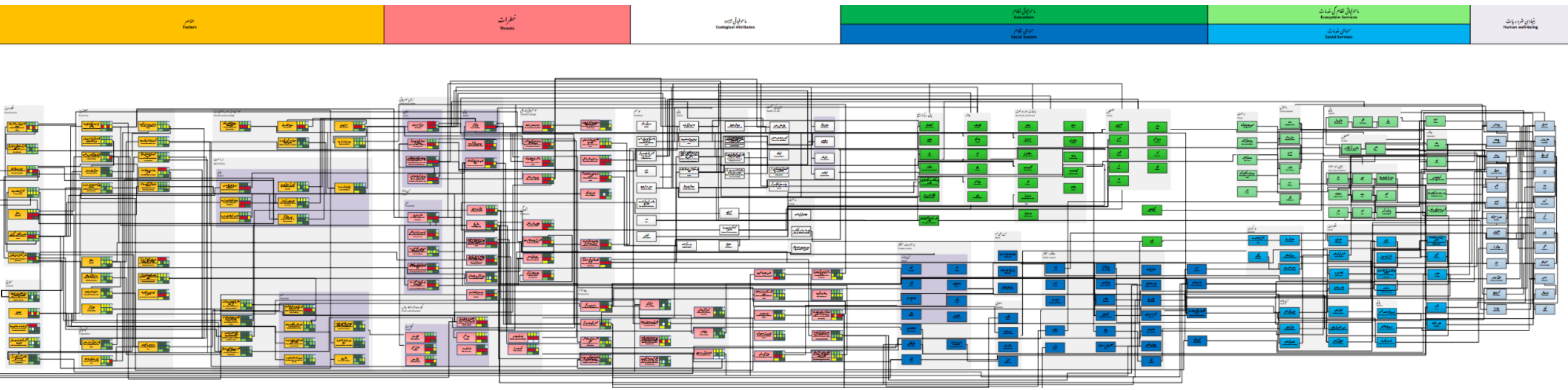
Photos: Alff 2022

Photos by TRANSECT team, 2022


Threats and underlying factors
Factor
Factor
Factor
Factor
Threat
Threat
Threat
Threat
Ecosystems
Natural ecosystem
Managed ecosystem I
Managed ecosystem II
Ecosystem services
Ecosystem service I
Ecosystem service II
Ecosystem service III
Human wellbeing targets
Human well-being target
Human well-being target
Human well-being target
Social systems
Social system I
Social system II
Social services
Social service I
Social service II
Enhancing connection
Diminishing connection

MARISCO Part I in Pakistan


عناصر


عوامل
Factors
خطرات
Threats
ماحولیاتی صفات
Ecological Attributes
ماحولیاتی نظام
Ecosystem
سماجی نظام
Social System
ماحولیاتی نظام کی خدمات
Ecosystem Services
سماجی خدمات
Social Services
انسانی فلاح و بہبود
Human well-being

No.	Threat	past criticality		present criticality		future criticality		Systemic activity	strategic relevance	knowledge (men)	manageability (men)
		men	women	men	women	men	women				
1	low quality pesticide and insecticide	1	1	4	4	3	4	4	31	1	2
2	excessive crop cultivation and chemical fertilizer usage reduce fertility of soil	1	1	3	4	3	4	4	29	1	2
3	sewerage water mixed in land	1	1	3	4	3	4	4	29	1	3
4	water deficiency	1	1	3	4	3	4	4	29	1	2
5	Increasing pest outbreaks and disease of crops	4	1	4	3	2	4	4	28	1	3
	Pinkbollworm	2	2	4	4	1	4	4	29	1	4
	Whitefly	3	2	4	4	2	3	4	29	1	3
	Potatoe early and late blight	4	2	3	4	2	4	4	28		
	Fall army worm	1	1	3	4	2	4	4	28	1	3
	Fruitfly	1	1	4	3	1	4	4	27	1	3
	Rice stem boarer	2	2	3	4	1	4	4	27	1	2
	Rust	2	1	2	4	1	3	4	24	1	2
6	Mixing of sewerage water into canal water	1	1	3	4	3	4	4	29	1	3
7	thief come at night while we are sleeping	1	2	4	3	3	4	4	29	1	3
8	increase in product rates, electricity or diesel expensive and load shedding during croop season	1	1	3	4	2	4	4	28	1	2
9	unseasonal rain	2	2	3	4	3	3	4	28	1	4
10	Deficiency in soil productivity due to sewerage water	1	2	2	4	3	4	4	27	1	3
11	polluted water of tubewells	1	1	3	3	3	4	4	27	1	3
12	low quality seed	1	1	4	3	1	4	4	27	1	2
13	The problem of substandard fertilizer	1	1	3	4	2	3	4	27	1	2
14	The increase in temperature (heatwave)	1	2	2	4	3	4	4	27	1	3
15	Threat to crops and orchards due to lowering of temperature	2	1	3	3	3	4	4	27	1	4
16	Reduce percentage of soil microorganisms (by fire to crop residues)	1	1	2	4	3	4	4	27	1	2
17	lack of tolerance	1	2	3	4	3	4	3	27	1	1
18	deficiency of underground water	1	1	2	3	4	4	4	26	1	4
19	unavailability of seed	3	1	3	4	1	3	4	26	1	1
20	several diseases due to impure water and food -> residual effect of chemicals in food	1	1	2	3	3	4	4	25	1	2

No.	Factor	Past criticality men	Past criticality women	Current criticality men	Current criticality women	Future criticality men	Future criticality women	Systemic activity	**Strategic relevance**	Knowledge (men)	Manageability (men)
1	corruption	2	3	4	4	4	4	4	**32**	1	4
2	non treatment of sewerage water	1	1	4	4	3	3	4	**30**	1	2
3	increasing population at high rate	2	1	4	4	4	3	3	**29**	1	2
4	sewerage water leaching underground	2	1	3	4	4	3	4	**29**	1	4
5	intervention of middleman in fertilizer	1	1	4	4	3	4	3	**28,5**	1	2
6	political and personal interference for personal benefits	1	2	2	4	4	4	4	**28**	1	2
7	no crop zoning	2	1	4	3	4	3	3	**27**	2	1
8	agricultural departments have no control	1	2	3	4	3	2	4	**27**	2	2
9	climate change	1	2	3	3	3	4	4	**27**	1	2
10	high temperature	2	1	3	4	3	4	3	**27**	1	2
11	insects and pest resistance due to current use of pesticide	1	1	4	4	3	4	2	**27**	1	1
12	low quality of companies' products	1	2	3	3	2	4	4	**26**	1	2
13	inflation	2		4	4	4		3	**26**	1	2
14	inflation in electricity rates affecting agriculture	1	2	4	4	3	3	2	**26**	1	2
15	high prices of solar panels	1	1	3	4	3	4	2	**25**	1	2
16	lack of resource of income in villages	2	1	3	4	2	3	3	**25**	1	2
17	deficiency of river water due to drought	2	3	2	4	3	2	4	**25**	1	2
18	dying of pollinating bees due to toxic pesticides	1	2	2	4	3	2	4	**25**	1	1
19	low quality pesticide	1	1	4	4	3	2	2	**25**	1	2
20	Non availability of subsidies due to non-paid taxes (by tax-payers)	1	2	3	4	2	4	2	**24**	2	2

Photo by M. Zuberi, 2022

Preliminary conclusion

- As expected, participants showed a strong grasp of their local environment and the complexity of interrelated factors affecting them
- Women were more critical and pessimistic about threats

→ **Today: presenting strategy development & evaluation results of second workshop round**

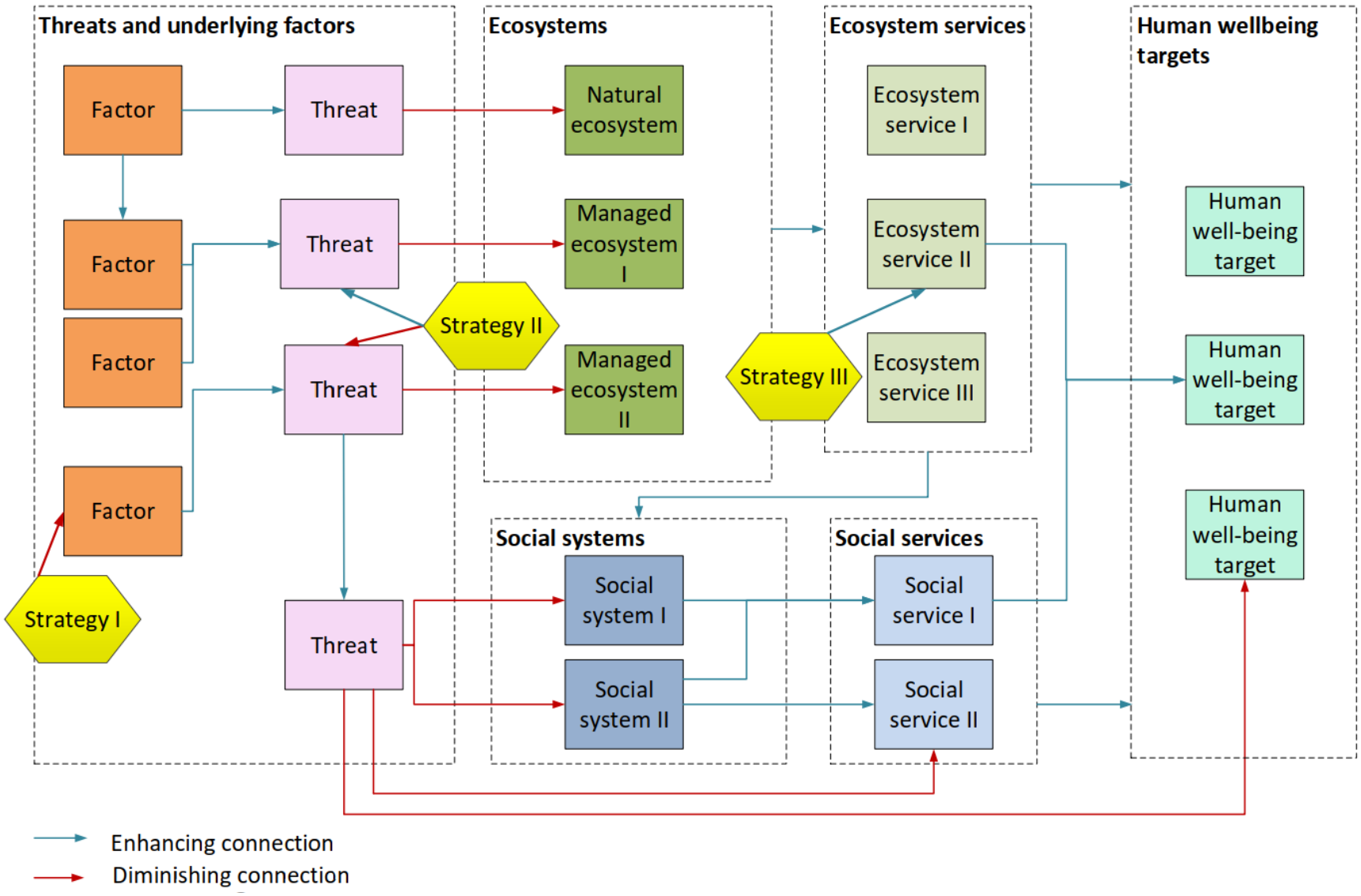
→ PARSCO Methodology guidebook developed by TRANSECT, publication in May 2025

Strategy formulation & assessment

Part II

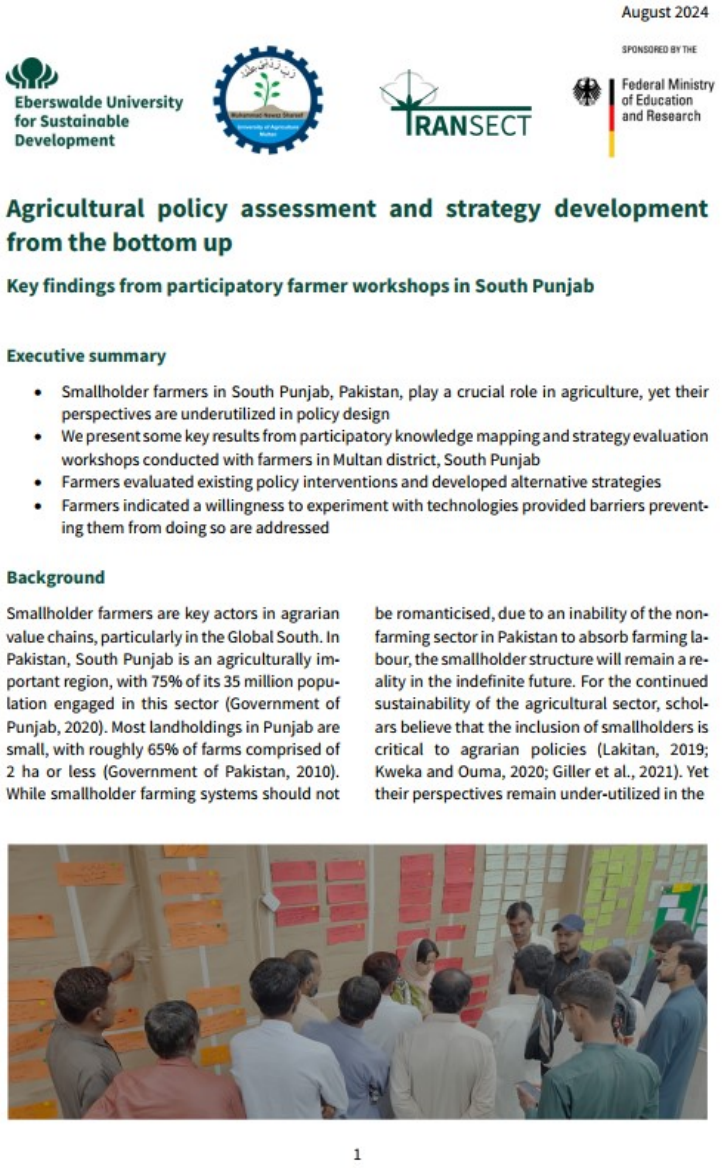
Workshop II: Identification, formulation & systematic assessment of *strategies*

- *Identification of existing strategies*
- *Gap analysis*
- *Formulation of alternative/complementary strategies*
- *Comprehensive assessment of existing & proposed strategies*



Outcomes of Phase II

- Total of 38 “existing” strategies initially identified, but reduced to 22 for more detailed evaluation
- 11 new strategies proposed by the participants
- Important insights into the opportunities and challenges of “bottom-up” strategy development in Pakistan



August 2024

SPONSORED BY THE

Eberswalde University for Sustainable Development

TRANSECT

Federal Ministry of Education and Research

Agricultural policy assessment and strategy development from the bottom up

Key findings from participatory farmer workshops in South Punjab

Executive summary

- Smallholder farmers in South Punjab, Pakistan, play a crucial role in agriculture, yet their perspectives are underutilized in policy design
- We present some key results from participatory knowledge mapping and strategy evaluation workshops conducted with farmers in Multan district, South Punjab
- Farmers evaluated existing policy interventions and developed alternative strategies
- Farmers indicated a willingness to experiment with technologies provided barriers preventing them from doing so are addressed

Background

Smallholder farmers are key actors in agrarian value chains, particularly in the Global South. In Pakistan, South Punjab is an agriculturally important region, with 75% of its 35 million population engaged in this sector (Government of Punjab, 2020). Most landholdings in Punjab are small, with roughly 65% of farms comprised of 2 ha or less (Government of Pakistan, 2010). While smallholder farming systems should not be romanticised, due to an inability of the non-farming sector in Pakistan to absorb farming labour, the smallholder structure will remain a reality in the indefinite future. For the continued sustainability of the agricultural sector, scholars believe that the inclusion of smallholders is critical to agrarian policies (Lakitan, 2019; Kweka and Ouma, 2020; Giller et al., 2021). Yet their perspectives remain under-utilized in the

1

Goal/vision defined in workshop II

- “Profitable agriculture in a peaceful environment for a good life. Agriculture continues in this area”

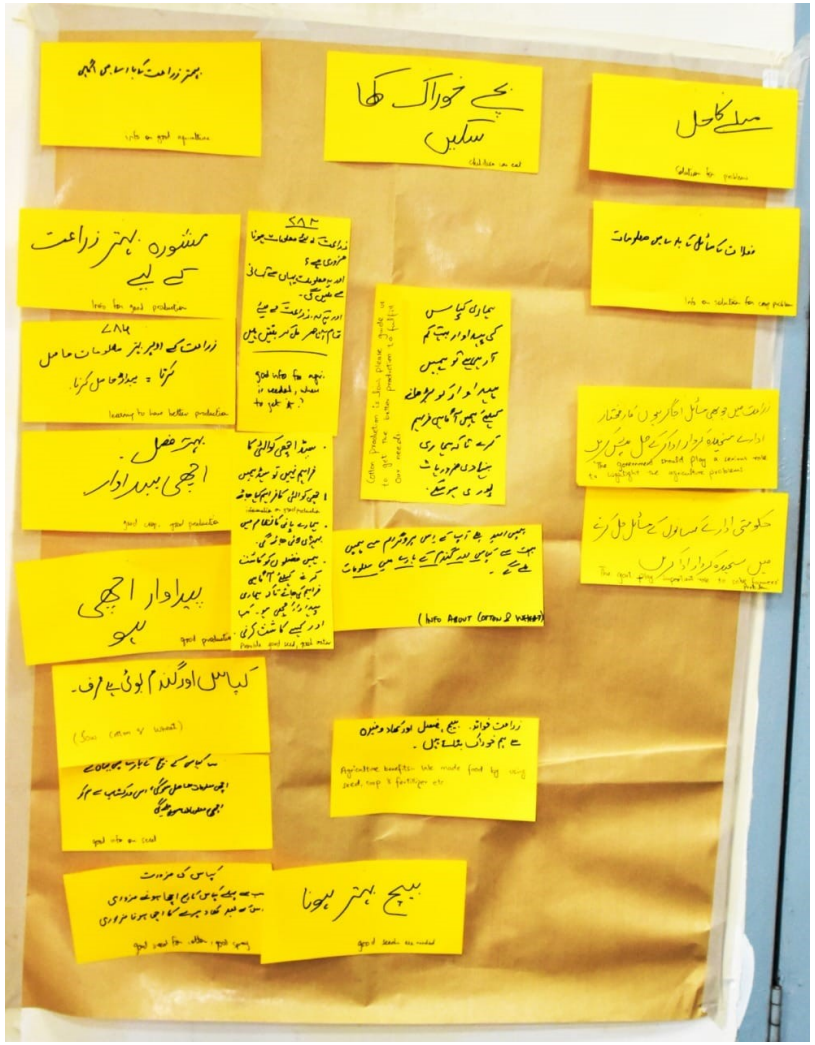


Photo by TRANSECT team, 2022

Identified existing strategies & their rating results

		Average feasibility score men (f)	Average impact score men (i_m)	Average impact score women (i_w)	**Total average impact score ($i=(i_m+i_w)/2$)**	**Total feasibility and impact score ((f+i)/2)**
1	Tree plantation	4.00	3.73	4.00	3.86	3.93
2	Subsidy for paved water channels	3.71	3.91	4.00	3.95	3.83
3	Kitchen gardening support	3.71	3.45	4.00	3.73	3.72
4	Free vaccination for animals	3.57	3.45	4.00	3.73	3.65
5	Biofortified wheat with Zinc	3.43	3.73	4.00	3.86	3.65
6	Hybrid seed	3.71	3.27	3.00	3.14	3.43
7	Integrated Pest Management	2.71	3.64	4.00	3.82	3.27
8	Subsidy for electricity of agricultural tubewells	2.71	3.00	4.00	3.50	3.11
9	Triple gene cotton	2.43	3.55	4.00	3.77	3.10
10	Subsidy for purchasing laser level machine	3.00	3.64	2.50	3.07	3.03
11	Cultivation of commercial vegetables	3.71	3.00	1.50	2.25	2.98
12	Increase of support price for wheat	3.71	2.82	1.50	2.16	2.94
13	Prohibition of sewerage water into canal water	2.00	3.45	4.00	3.73	2.86
14	Providing animals to farmers for their financial support	2.14	3.09	4.00	3.55	2.84
15	Loan for purchasing solar system tubewell	2.57	2.73	3.50	3.11	2.84
16	Prohibition on burning of crop residues	2.00	3.55	3.50	3.52	2.76
17	Contract farming	2.71	2.82	2.50	2.66	2.69
18	Happy seeder drill that helps to mix rice stubbles into soil	2.71	3.73	1.50	2.61	2.66
19	Subsidy on agricultural implements	3.14	3.27	1.00	2.14	2.64
20	Providing honeybee hives to women for their financial support (by WWF)	2.00	2.36	4.00	3.18	2.59
21	Deflation in DAP prices	1.86	3.00	3.50	3.25	2.55
22	Availability of Kissan Card	1.57	1.73	1.00	1.36	1.47

Identified existing strategies & their rating results

		Average feasibility score men (f)	Average impact score men (i_m)	Average impact score women (i_w)	**Total average impact score ($i=(i_m+i_w)/2$)**	**Total feasibility and impact score ((f+i)/2)**
1	Tree plantation	4.00	3.73	4.00	3.86	3.93
2	Subsidy for paved water channels	3.71	3.91	4.00	3.95	3.83
3	Kitchen gardening support	3.71	3.45	4.00	3.73	3.72
4	Free vaccination for animals	3.57	3.45	4.00	3.73	3.65
5	Biofortified wheat with Zinc	3.43	3.73	4.00	3.86	3.65
6	Hybrid seed	3.71	3.27	3.00	3.14	3.43
7	Integrated Pest Management	2.71	3.64	4.00	3.82	3.27
8	Subsidy for electricity of agricultural tubewells	2.71	3.00	4.00	3.50	3.11
9	Triple gene cotton	2.43	3.55	4.00	3.77	3.10
10	Subsidy for purchasing laser level machine	3.00	3.64	2.50	3.07	3.03
11	Cultivation of commercial vegetables	3.71	3.00	1.50	2.25	2.98
12	Increase of support price for wheat	3.71	2.82	1.50	2.16	2.94
13	Prohibition of sewerage water into canal water	2.00	3.45	4.00	3.73	2.86
14	Providing animals to farmers for their financial support	2.14	3.09	4.00	3.55	2.84
15	Loan for purchasing solar system tubewell	2.57	2.73	3.50	3.11	2.84
16	Prohibition on burning of crop residues	2.00	3.55	3.50	3.52	2.76
17	Contract farming	2.71	2.82	2.50	2.66	2.69
18	Happy seeder drill that helps to mix rice stubbles into soil	2.71	3.73	1.50	2.61	2.66
19	Subsidy on agricultural implements	3.14	3.27	1.00	2.14	2.64
20	Providing honeybee hives to women for their financial support (by WWF)	2.00	2.36	4.00	3.18	2.59
21	Deflation in DAP prices	1.86	3.00	3.50	3.25	2.55
22	Availability of Kissan Card	1.57	1.73	1.00	1.36	1.47

Gap analysis & formulation of alternative/complementary strategies

No.		ماضی کی اہمیت خواتین	موجودہ اہمیت مرد خواتین	مستقبل کی اہمیت مرد خواتین	نقاوی سرکردگی	حکمت عملی کے لیے مطابقت	معلومات	تبدیلی کی صداجت	
1	بدعنوانی	2 3	4 4	4 4	4	32	1	4	
2	سیوریج کے پانی کو مناسب اصلاح نہ کرنا	1	4 4	3 3	4	30	1	2	2
3	تیزی سے آبادی کا بڑھنا	2	4 4	4 3	3	29	1	2	
4	سیوریج کا پانی کا زمین دوش ہونا	2	3 4	4 3	4	29	1	4	2
5	آبی زرخیزی کھادوں میں داخلت	1	4 4	2.5 4	3	28.5	1	2	(14)
6	سیاسی اور ذاتی مفاد	1	2 2	4 4	4	28	1	2	
7	فصل کی زود تلف نہ ہونا	2	4 3	4 3	3	27	2	1	
8	نوارروں کا کنٹرول صحیح نہیں	1 2	3 4	3 2	4	27	2	2	
9	موسمی تبدیلی	2	3 3	3 4	4	27	1	2	
10	درجہ حرارت بڑھ جانا	2	3 4	3 4	3	27	2	2	(1)
11	مجموعہ زہروں کے استعمال سے کیڑے مکوڑوں میں قوت مدافعت بڑھنا ہونا	4	4 3	3 4	2	27	1	2	22
12	غیر معیاری کمپنی کا بنایا ہوا پراڈکٹ	2	3 3	2 4	4	26	1	2	
13	مہنگائی	2	4 4	4	3	26	1	2	3,4
14	زرعی بجلی کی مہنگائی	2	4 4	3 3	2	26	1	2	7, 8
15	سولر پلیٹ کا مہنگا ہونا	2	3 4	3 4	2	25	1	2	8
16	دیہات میں زرعی معاش کا کم ہونا	2	3 4	2 3	3	25	1	2	10, 17
17	دریائی خشک سالی	2 3	2 4	3 2	4	25	1	2	
18	زہروں کے وجہ سی مٹھے توالد کرنے والی مکھیوں کا مرجانا	2	2 4	3 2	4	25	1	1	17
19	ناقص زہر	1	4 4	3 2	2	25	1	2	22
20	ٹیکس کے عدم ادائگی سی سہولتی کے عدم دستیابی	2	3 4	2 3	2	24	2	2	
21	حکومت پالیسیوں کا عمل درآمد نہ ہونا	3	3 2	3 2	4	23	1	3	
22	بجلی کی کمی	4	4 4	3 4	3	23	2	2	8
23	شعبہ زراعت کا غیر منافع بخش ہونا	2 2	3 4	3 2	2	23	2	2	14, 3, 12,
24	سیلابی پانی کو کنٹرول نہ کرنا (ڈیم نہ ہونا)	2 2	4 4	3 2	4	23	2	2	21
25	فصلات کی فروخت میں دلال مین کا اثر انداز ہونا	2 2	4 4	3 3	3	22	2	2	
	نہری مصنوعی قلت ضرورت کے وقت	2	2 4	2 4	2	22	2	2	19

What kind of alternative/complementary strategies did farmers envision?

Complementary /Alternative Strategies

		Average feasibility score men (f)	Average impact score men (i_m)	Average impact score women (i_w)	**Total average impact score ($i=(i_m+i_w)/2$)**	**Total feasibility and impact score ($((f+i)/2)$)**
1	Biodiversity maintenance for pest control	3.00	3.91	4.00	3.95	3.48
2	Green manuring	3.43	3.91	3.00	3.45	3.44
3	Subsidy should be given to companies, and subsidized bags should have special color and ID	2.86	3.00	4.00	3.50	3.18
4	Development of heat-resistant varieties	2.71	3.45	3.50	3.48	3.10
5	Research and development on chemicals to purify toxic sewerage water	2.00	3.55	3.00	3.27	2.64
6	Use of GIS technology for getting information on disease and insect pests	2.43	3.36	2.00	2.68	2.56
7	Provision of nutrients sensors	1.86	3.45	3.00	3.23	2.54
8	Provision of insurance during natural disasters to farmers on Islamic basis	2.86	3.09	1.00	2.05	2.45
9	Installation of ultra-high density orchard plantations	2.43	3.36	1.00	2.18	2.31
10	Installation of drip irrigation systems	1.86	2.91	2.50	2.70	2.28
11	Crop zoning	2.29	3.00	1.50	2.25	2.27

Complementary /Alternative Strategies

Most strategies:

- Reflect ideal of agriculture as modern, technically advanced, with high productivity
- Rather top-down strategies requiring external support
- Eventually, proposed strategies not evaluated better than existing ones!

		Average feasibility score men (f)	Average impact score men (i_m)	Average impact score women (i_w)	**Total average impact score ($i=(i_m+i_w)/2$)**	**Total feasibility and impact score ($((f+i)/2)$)**
1	Biodiversity maintenance for pest control	3.00	3.91	4.00	3.95	3.48
2	Green manuring	3.43	3.91	3.00	3.45	3.44
3	Subsidy should be given to companies, and subsidized bags should have special color and ID	2.86	3.00	4.00	3.50	3.18
4	Development of heat-resistant varieties	2.71	3.45	3.50	3.48	3.10
5	Research and development on chemicals to purify toxic sewerage water	2.00	3.55	3.00	3.27	2.64
6	Use of GIS technology for getting information on disease and insect pests	2.43	3.36	2.00	2.68	2.56
7	Provision of nutrients sensors	1.86	3.45	3.00	3.23	2.54
8	Provision of insurance during natural disasters to farmers on Islamic basis	2.86	3.09	1.00	2.05	2.45
9	Installation of ultra-high density orchard plantations	2.43	3.36	1.00	2.18	2.31
10	Installation of drip irrigation systems	1.86	2.91	2.50	2.70	2.28
11	Crop zoning	2.29	3.00	1.50	2.25	2.27

Why do smallholders mirror the imaginaries of policy makers?

		Average feasibility score men (f)	Average impact score men (i_m)	Average impact score women (i_w)	**Total average impact score ($i=(i_m+i_w)/2$)**	**Total feasibility and impact score ($((f+i)/2)$)**
1	Biodiversity maintenance for pest control	3.00	3.91	4.00	3.95	3.48
2	Green manuring	3.43	3.91	3.00	3.45	3.44
3	Subsidy should be given to companies, and subsidized bags should have special color and ID	2.86	3.00	4.00	3.50	3.18
4	Development of heat-resistant varieties	2.71	3.45	3.50	3.48	3.10
5	Research and development on chemicals to purify toxic sewerage water	2.00	3.55	3.00	3.27	2.64
6	Use of GIS technology for getting information on disease and insect pests	2.43	3.36	2.00	2.68	2.56
7	Provision of nutrients sensors	1.86	3.45	3.00	3.23	2.54
8	Provision of insurance during natural disasters to farmers on Islamic basis	2.86	3.09	1.00	2.05	2.45
9	Installation of ultra-high density orchard plantations	2.43	3.36	1.00	2.18	2.31
10	Installation of drip irrigation systems	1.86	2.91	2.50	2.70	2.28
11	Crop zoning	2.29	3.00	1.50	2.25	2.27

- Journal arcticle currently under review in Journal of Integrative Environmental Sciences (2nd round):

  Zuberi et al. (2025): “Constrained Spatial Imaginaries of Smallholder Farmers: Perspectives from South Punjab, Pakistan”

- Research Question:
  Why were the farmers mirroring the ideas or *imaginaries* of the state and powerful non-state actors that they criticised in the first place?

Imaginaries and Spatial Imaginaries

- **Imaginaries** are the ways in which *"ordinary people "imagine" their social surroundings"* (Taylor 2002, p. 106).
- Sense making process embedded in the **past**, that explains how things **presently** came to be, and determines what collectively constitutes a **desirable future** (Argüelles 2021)
- **Spatial imaginaries** are "*cognitive frameworks, both collective and individual, constituted through the lived experiences, perceptions, and conceptions of space itself*" (Wolford 2004, p. 410).

Constrained Spatial Imaginaries

- “what is considered desirable is also conditioned by what is perceived as materially possible” (Schmook et al. 2023, p. 306).
- **Constraints that curtail the freedom to imagine alternatives to what is**

What are spatial imaginaries constrained by?

Historical legacies

- Smallholder agriculture subjected to intensification practices and policies that encourage the conversion of diverse, multicropping systems into monocropped land
- Decades long implementation of Green Revolution technologies
- Undermining of local knowledge and food security goals were subsumed under yield goals
- Dominance of technocratic approaches and synthetic inputs in policies to support smallholders

What are spatial imaginaries constrained by?

Structures

- Smallholder farming is presently subjected to the corporate agriculture economy -- Free market policies and contraction of state welfare
- Farmers' struggle for better agricultural conditions is reduced to the struggle for better access to external inputs
- The shift of knowledge away from the farm—and the farmers—to corporations and technocrats
- Digitalisation and technology meant to empower farmers can end up exerting greater corporate control on farmlands (Hackfort 2021).

What are spatial imaginaries constrained by?

Livelihood vulnerabilities

- “Choices are always constrained, and they are especially constrained for the poorest people, who have the least capacity to choose the food and farm regime they want” (Li 2014, p. 209).
- What is desirable becomes equated with what is imagined as possible (Schmook et al. 2023).
- Farmers become “locked into new relations of production from which they could not withdraw” (Li 2014, p. 209)
- Concerns of smallholders are immediate and tangible

Concluding thoughts

- Imaginaries of smallholders may not signify radical change but, paradoxically, often align with existing paradigms of industrial agriculture that marginalizes them in the first place
- Notion of **constrained** spatial imaginaries can offer a useful analytical lens to make sense of these apparent contradictions.
- In Pakistan: imaginaries of farmers are curtailed by historical legacies, structural constraints, and livelihood vulnerabilities
- As a consequence, alternative discourses of agrarian futures are limited – but more awareness could be created through horizontal learning; exposure to alternative ideas from elsewhere
- Transdisciplinary approaches like MARISCO must take the aspirations of smallholders seriously – regardless of how paradoxical these may seem.