POLICY DASHBOARD DEVELOPMENT

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Deltares

Excerpts from slides prepared for Water, Peace and Security tailor-made capacity development activities in Iraq. Please attribute authors when using materials.

Topics

المواضيع

- What is a dashboard?
- What are the dashboard components?
- How is the dashboard developed?
- How to use the dashboard

ما هي لوحة القيادة؟

ما هي مكونات لوحة القيادة؟

كيف يتم تطوير لوحة القيادة؟

كيفية استخدام لوحة القيادة

Question 1

What kind of information do you use to make decisions at your work?

For example

- Zonning plans
- Scenarios
- Discussion with other departments
- Reports
- …

سؤال

ما نوع المعلومات التي تستخدمها لاتخاذ القرارات في عملك؟

- فمثلا
- خطط التقسيم
- سيناريوهات
- المناقشة مع الأقسام الأخرى
- التقارير
- ....

What is a dashboard?

ما هي لوحة القيادة؟

- **"exploitable information"**
  - Shows interconnections
  - BUT reduces complexity
- Helps to understand the impacts of our choices
- Facilitates discussion

- يظهر الترابط
- ولكن يقلل من التعقيد
- يساعد على فهم تأثيرات اختياراتنا
- يسهل المناقشة

What is a policy dashboard?

- It is a **tool**
- Goal: What are the short/long-term impacts of our measures?
- Function: Planning and long-term decision making
- Time frame: CURRENT and/or FUTURE

ما هي لوحة معلومات السياسة؟

- إنها أداة
- الهدف: ما هي التأثيرات قصيرة / طويلة المدى لتدابيرنا؟
- الوظيفة: التخطيط واتخاذ القرارات على المدى الطويل
- الإطار الزمني: الحالي و / أو المستقبل

What the policy dashboard is NOT

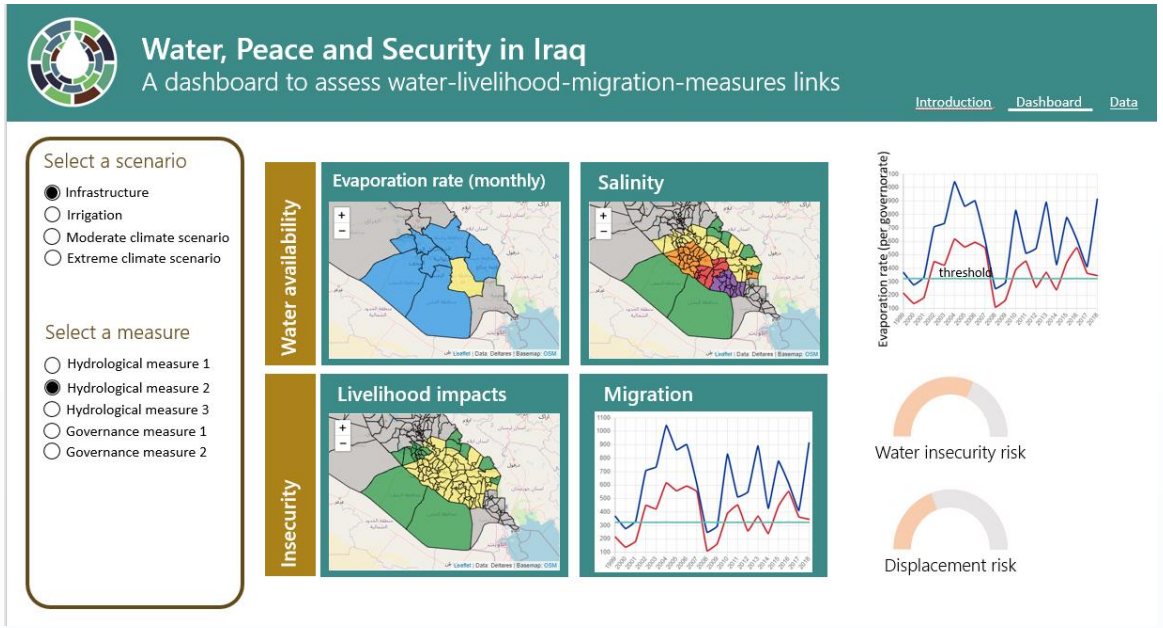
- NOT an operational monitoring dashboard
- NOT a tool for information in real time

ما هي لوحة معلومات السياسة ليست كذلك

- ليست لوحة مراقبة تشغيلية
- ليست أداة للمعلومات في الوقت الحقيقي

Dashboards can be used as a...

يمكن استخدام لوحات التحكم باعتبارها ...



...facilitate dialogue between stakeholders...

تسهيل الحوار بين أصحاب المصلحة...

...Decision Support System, planning kit...

... نظام دعم القرار ، مجموعة التخطيط ...

Question 2

سؤال

What tools and methods do you use to make decisions at work?

For example

- No tools
- Workshops
- Meetings
- Models
- …

ما الأدوات والأساليب التي تستخدمها لاتخاذ القرارات في العمل؟

فمثلا

لا توجد أدوات

ورش عمل

الاجتماعات

Who can use it?

من يمكنه استخدامه؟

- End-users (policy maker)
- Policy analysts
- Project leaders
- Modellers from different disciplines
- Data scientists
- Environmental scientist
- Tool/software developers
- …

- المستخدمون النهائيون (صانع السياسة)
- محللو السياسات
- قادة المشروع
- نماذج من مختلف التخصصات
- علماء البيانات
- عالم بيئي
- مطورو الأدوات / البرمجيات
- …

What are the dashboard components?

Objective: what do we want to accomplish?

Scenario: the external economic, environmental or political situation affecting the impact of our strategy.

Measure: What are we going to do? Intervention (action taken) to achieve the goal.

Indicator: How far have we achieved the objective? Measurement or value.

Strategy: How do we accomplish the goal? Logical combination of individual measures.

ما هي مكونات لوحة القيادة؟

الهدف: ما الذي نريد تحقيقه؟

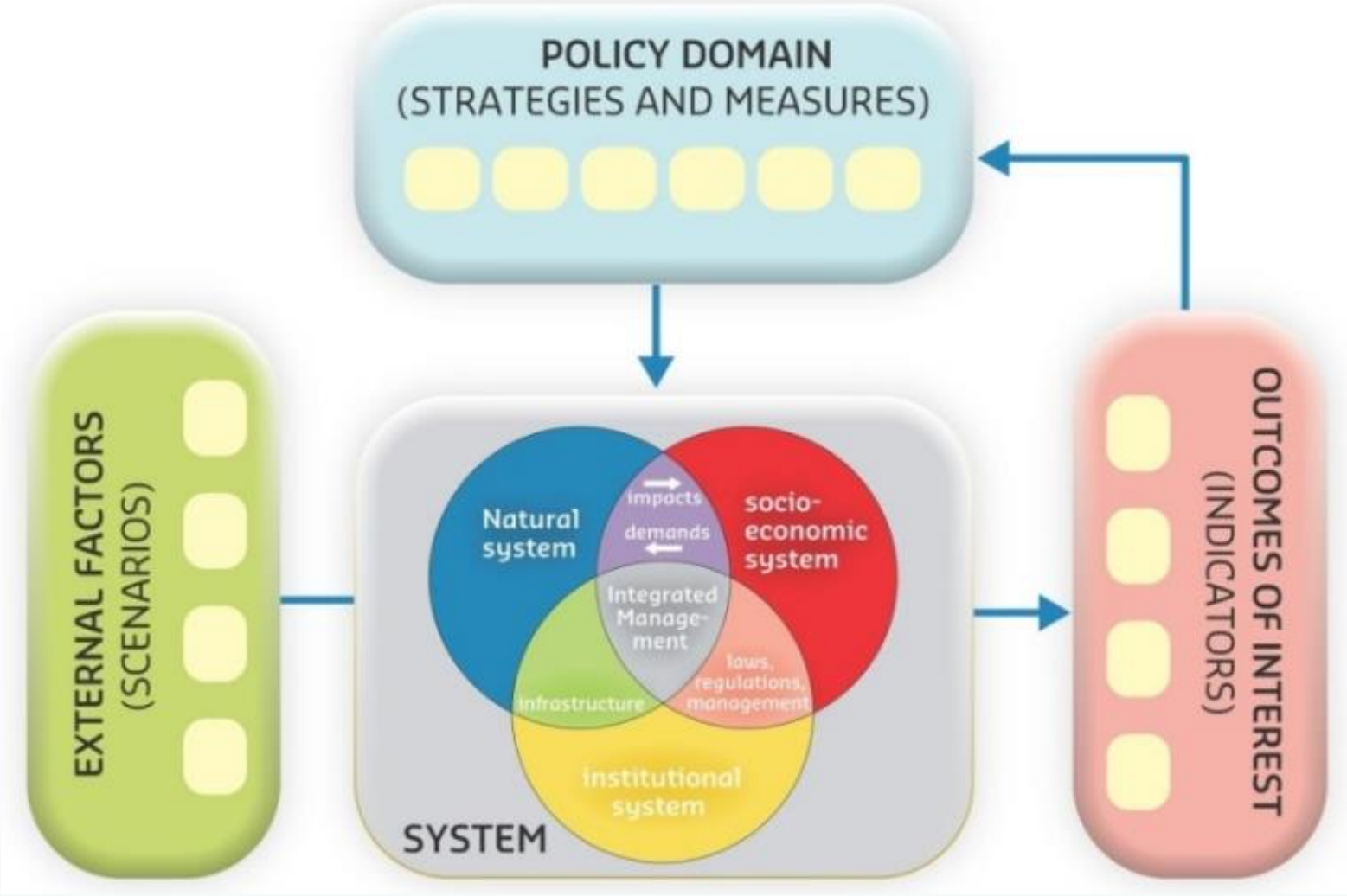
السيناريو: الوضع الاقتصادي أو البيئي أو السياسي الخارجي الذي يؤثر على تأثير استراتيجيتنا.

القياس: ماذا سنفعل؟ التدخل (الإجراءات المتخذة) لتحقيق الهدف.

المؤشر: إلى أي مدى حققنا الهدف؟ القياس أو القيمة.

الإستراتيجية: كيف نحقق الهدف؟ التركيبة المنطقية للقياسات الفردية.

الاستراتيجيات والتدابير



سيناريوهات

المؤشرات

Question 3

سؤال

Do you use scenarios? Which one?

For example

- Climate scenarios
- Population increase scenarios
- …

هل تستخدم السيناريوهات؟ أيها؟

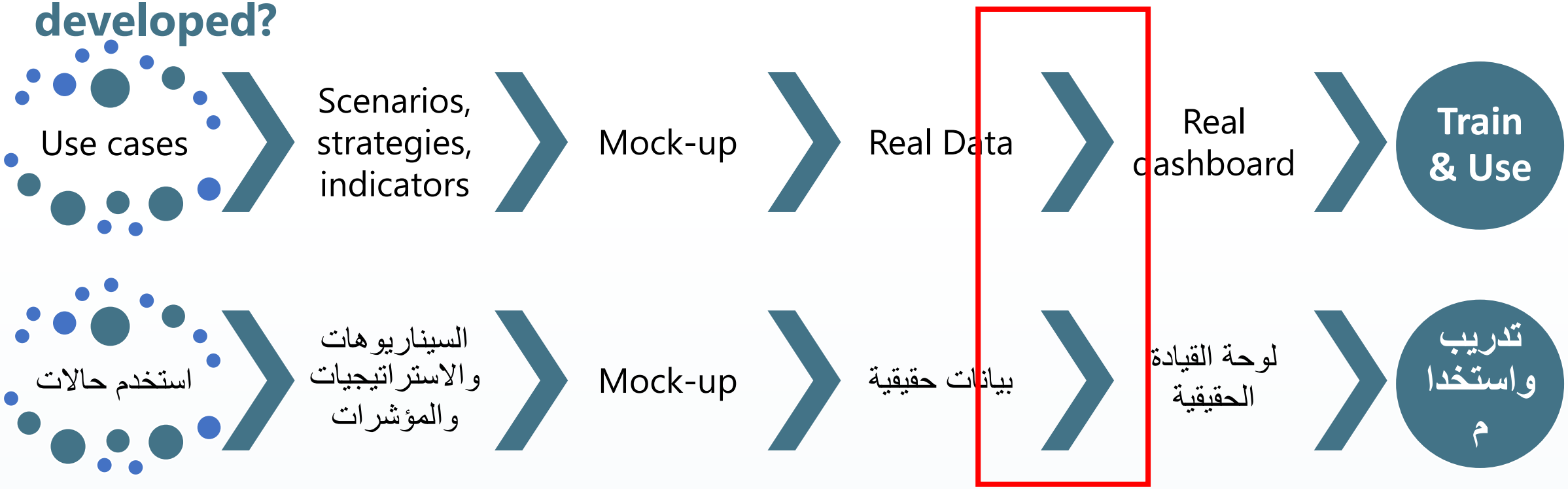
فمثلا

سيناريوهات المناخ

سيناريوهات الزيادة السكانية

How is the dashboard developed?

كيف يتم تطوير لوحة القيادة؟



- Who will use it?
- What information do they need?
- For what purpose?
  - من سيستخدمها؟
  - ما هي المعلومات التي يحتاجونها؟
  - لأي سبب؟

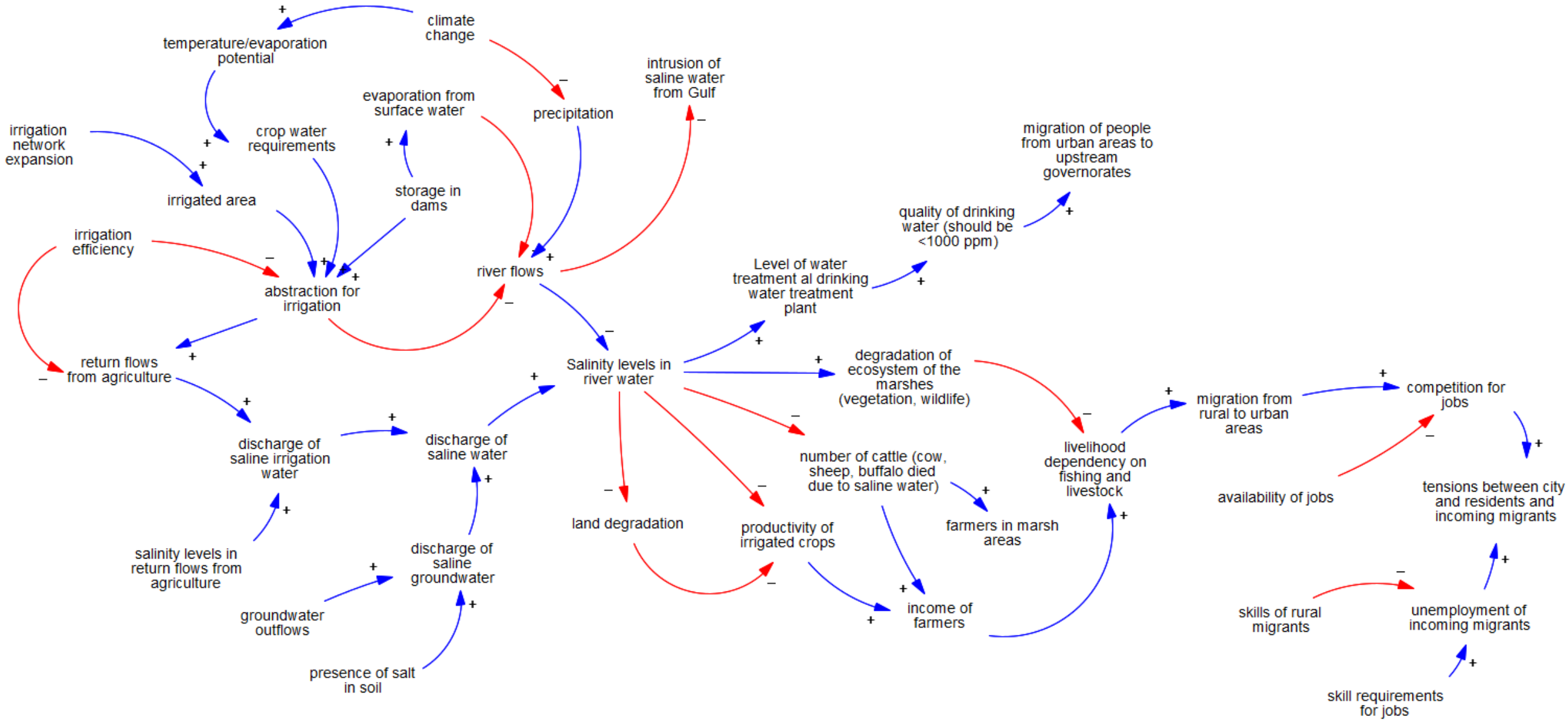
- Evaluate first mock-up
- Improvements in the design
  - تقييم
  - تحسينات في التصميم

- Present final dashboard
- Train how to use
  - عرض لوحة القيادة النهائية
  - تدريب كيفية الاستخدام

Causal loop diagram

understanding causes and consequences

فهم الأسباب والعواقب



From the use cases

“As a < role > ”
”I would like to know < specific information need > “
“In order to < specific action based on the information > ”

Example

« …*As a representative of the water resources management department, I would like to know what is the impact of dam operation on downstream salinity levels in order to optimize operation rules… »*

من حالات الاستخدام

"باعتباره <دور>"
"أود أن أعرف <حاجة إلى معلومات محددة>"
"من أجل <إجراء محدد بناءً على المعلومات>“

مثال

«... بصفتي ممثلاً لقسم إدارة الموارد المائية ، أود أن أعرف ما هو تأثير تشغيل السد على مستويات ملوحة المصب من أجل تحسين قواعد التشغيل ...»

From the use cases

understanding what you want to see and the purpose

من حالات الاستخدام

فهم ما تريد رؤيته والغرض

Scenarios (External factors)

1. ~~Inf… infrastructural improvements > not an external driver~~
2. ~~Irri… s moved to "measures"~~
3. Re… ting reduced inflow from upstream countries due to policies, dams or diversions upstream)
4. Moderate climate scenario
5. Extreme climate scenario
6. Population increase

Reference year: 1988 (ton confirm) was a period where there was not so much change in the regime of the river

Reduced inflow

Measures

2 Preliminary measures

Hard me…

- …by changing the efficiency in RIBASIM
- …linating water and adding it to the system) > it can be modeled in RIBASIM
- Purification of water > improvement of water quality results in less reasons for people to migrate from rural area…
- Enhance water storage… …ams, new locations > to che…
- Crop diversification/cha… …discuss if necessary

Irrigation efficiency

Water storage increase

Soft measures[3]

- Improvement in water allocation process > it can b… priority allocation options together with stakeholder… priorities per sector, change allocation priorities spatially (e.g. different cities), give environmental flow higher priority, etc. This needs might need to be discuss in the coming workshop
- Implementation of forecast system for droughts (next week, 2 weeks) > define weight of measure with stakeholders. People normally need to wait to see how much water the river has so they can only be reactive, but if the information is share on time with the community, then they can prepare better. This is relevant, but it is unclear how a weighted "model" could be linked with RIBASIM and the ABM
- Awareness water-society links > define weight of measure with stakeholders. This is relevant, but it is unclear how a weighted "model" could be linked with RIBASIM and the ABM
- ~~Alternative livelihood options (crop change/diversification; education)~~ > this can be …
- … the ABM

Water allocation

Change in livelihood

Indicators (outcomes of interest)

- Rural-urban migration (triggered by water shortage) > g…
- Water quality > from delwaq / RIBASIM, how water qua… …ater system health indicator
- … > define weight of measure with stakeholders …griculture, livestock and fishery? → this would need input from local outreach)
- Migration ~~> conflict risk indicator~~
- ~~Land use change (how, what?) (I'm not sure ab… moment)~~
- Water availability per governorate
- Degradation Marshes? > is this something we could incorporate in the models?

Note for the dashboard: it would be nice if on a 'comparison slide' of the dashboard we could show how these measures (put in a selection menu) potentially impact the indicators (maps and bar charts). I can imagine that for water availability and quality this would be based on a map giving the states a certain color depending on the value of the indicator, and for the other ones with the bar charts.

Water quality

Rural-urban migration

Water availability

From the ABM

understanding the behavior of
individuals and their impact on the system

منABM

فهم سلوك الأفراد وتأثيرهم على النظام

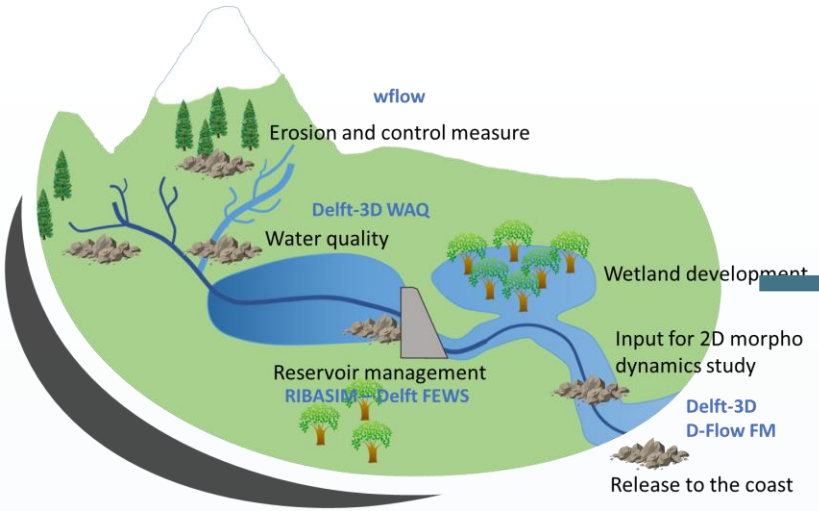
Rural-urban migration indicator

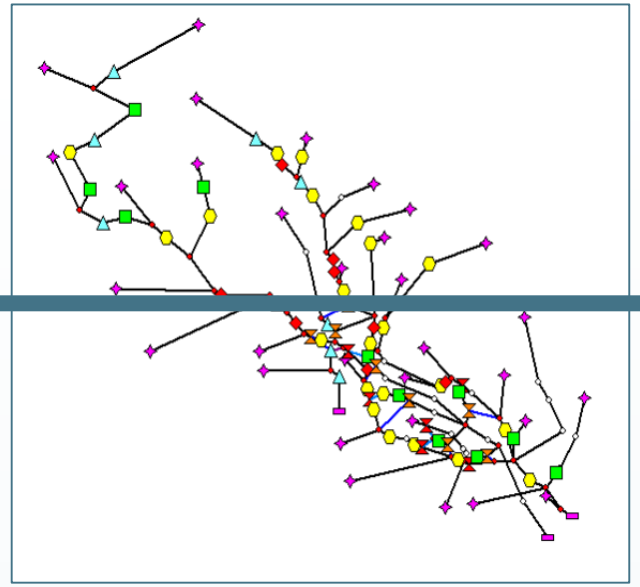
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	*Water influx*												
2	Perceived probability water quantity (private water supply)		Farmers	Perceived probability (water quantity)		Risk Appraisal Farmer (water quantity)		Risk Appraisal (combined)		AI Threshold			
3	0.5			0.25		0.609		0.618		0.495			
4						RA = 1 / (1 + exp(-x * P * S - zeta))		The highest RA					
5	Perceived probability water quantity (irrigation water)												
6	0.5			Perceived probability (water quality)		Risk Appraisal Farmer (water quality)		Adaptation Appraisal		Adaptation Intention (AI)		Migrate?	
7				0.5		0.618		-0.01		0.304		no	
8	Perceived probability water quality (all water)					RA = 1 / (1 + exp(-x * P * S - zeta))		AA = a(AE) + b(SE) - y(CE)		AI = y(AA) + z(RA)			
9	0.5												
10													
11													
12			City dwellers	Perceived probability (water quantity)		Risk Appraisal City Dweller (water quantity)		Risk Appraisal (combined)		AI Threshold			
13				0.5		0.606		0.606		0.495			
14						RA = 1 / (1 + exp(-x * P * S - zeta))		The highest RA					
15													
16				Perceived probability (water quality)		Risk Appraisal City Dweller (water quality)		Adaptation Appraisal		Adaptation Intention (AI)		Migrate?	
17				0.5		0.603		-0.01		0.298		no	
18						RA = 1 / (1 + exp(-x * P * S - zeta))		AA = a(AE) + b(SE) - y(CE)		AI = y(AA) + z(RA)			
19													
20													
21								INPUT					
22				Variables with the same values for farmers and city dwellers						Variables with different values per farmer/city dweller			
23				*Variable name*	*Explanation*	*Value*	*Default value*		*Variable name*	*Explanation*	*City dwellers*	*Defa*	*Farmers*	*Default value*
24				x	Risk assessment parameter	0.2	0.2		S	Perceived severity				
25				zeta	Risk elasticity	0.4	0.4		S	Perceived severity (quantity)	0.3	0.3	0.85	0.85
26														
27				a	Weighing factor for AE	0.35	0.35							
28				b	Weighing factor for SE	0.35	0.35							
29				y	Weighing factor for CE	0.3	0.3							
30														
31				AE	Adaptation efficacy	0.2	0.2							
32				SE	Self-efficacy	0.2	normal distribution with mean = 0.2							
33				CE	Cost estimate	0.5	0.5							
34														
35				y	Weighing factor for Adaptation Appraisal	0.5	0.5							
36				z	Weighing factor for Risk Appraisal	0.5	0.5							
37														

	E	F	G	H	I	J	K	L	M
	ed-(	total-migr	out-migra	migrated-(	migrated-(	total-migr	out-migra	migrated-(	migrated-(	total-
3	30	105	0	28	10	38	50	169	76	
4	16	69	0	32	10	42	25	132	79	
5	3	8	58	28	94	0	30	12	42	33	133	66	
6	4	10	53	26	89	0	32	9	41	32	125	58	
7	5	11	42	15	68	0	38	13	51	22	196	86	
8	6	4	46	13	63	0	27	6	33	42	168	65	
9	7	13	47	13	73	1	45	15	61	33	170	74	
10	8	9	47	20	76	0	44	9	53	37	159	78	
11	9	10	57	20	87	0	29	13	42	42	184	92	
12	10	6	39	17	62	0	23	9	32	40	121	50	
13	11	3	29	14	46	0	51	21	72	36	148	56	
14	12	6	58	21	85	0	23	9	32	39	138	60	
15	13	7	47	17	71	0	42	13	55	43	105	48	
16	14	12	69	31	112	4	50	22	76	29	116	50	
17	15	10	50	26	86	0	37	4	41	19	126	57	
18	16	4	44	16	64	1	56	13	70	33	163	69	
19	17	7	44	15	66	0	37	8	45	31	140	61	
20	18	9	41	21	71	2	36	21	59	57	153	53	
21	19	14	60	29	103	0	37	18	55	31	94	59	
22	20	14	59	6	79	1	52	15	68	28	126	53	
23	21	5	32	19	76	0	34	13	47	46	142	66	
24	22	9	46	11	66	1	43	19	63	37	140	68	
25	23	15	48	19	82	1	36	14	51	44	126	68	
26	24	9	42	15	66	1	34	13	48	37	148	78	
27	25	4	51	18	73	2	55	24	81	43	155	63	
28	26	13	77	20	110	0	45	12	57	33	141	65	
29	27	8	50	21	79	0	41	12	53	42	183	89	
30	28	8	43	13	64	0	37	14	51	34	132	52	
31	29	7	53	17	77	1	37	17	55	44	158	75	
32	30	7	53	20	80	0	36	15	51	27	125	51	
33	31	11	60	15	86	0	32	15	47	36	172	85	
	32	10	63	25	98	0	21	9	30	35	160	81	

From the hydrological model
understanding the water system

من النموذج الهيدرولوجي
فهم نظام المياه





Water quality and quantity indicators and measures
مؤشرات ومقاييس جودة وكمية المياه

Reduced inflow scenario
سيناريو انخفاض التدفق

Water allocation measure
قياس تخصيص المياه

Wflow hydrological model + RIBASIM water resource model

How the information looks

كيف تبدو المعلومات

	A	B	C	D	E
1	scenario	full_name			
2	scenario_1	reduced inflow	RIBASIM		
3	scenario_2	moderate climate scenario	RIBASIM		
4	scenario_3	extreme climate scenario	RIBASIM		
5	scenario_4	population increase	check with stakeholders		
6					

Each step needs validation!
كل خطوة تحتاج إلى التحقق من الصحة!

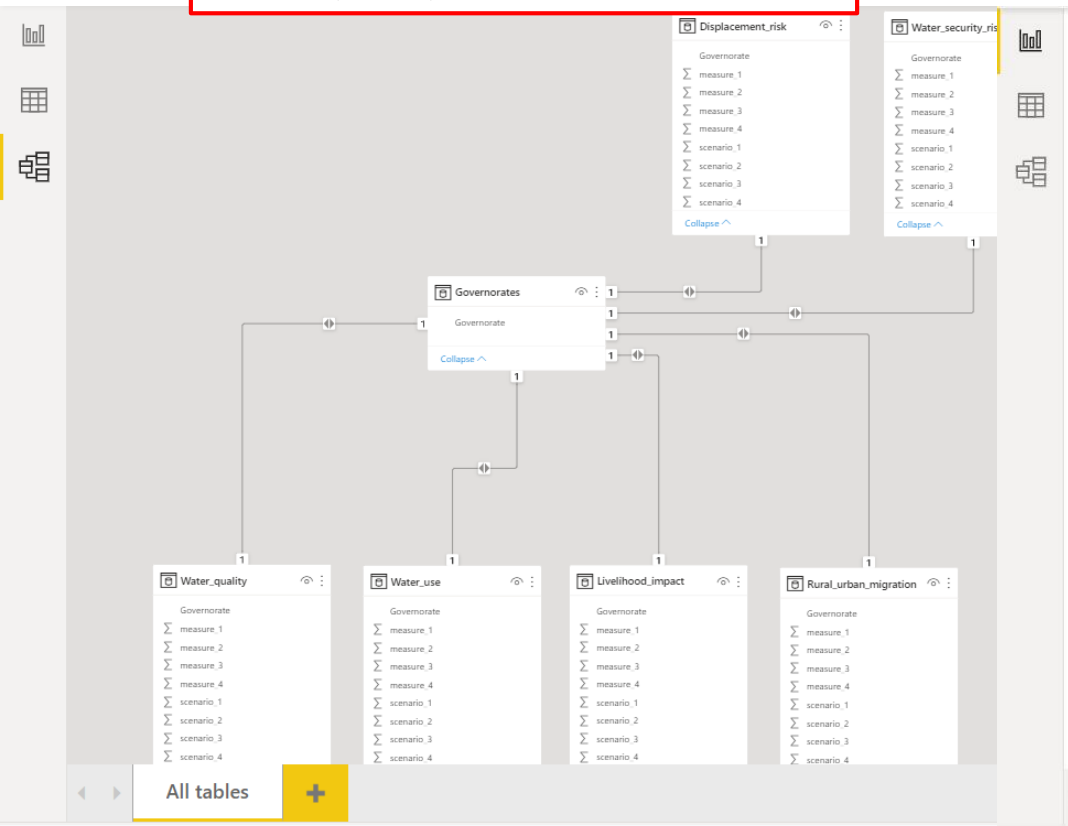
	A	B	C	D	E	F	G
1	measure	type_measure	full_name				
2	measure_1	hard	increase irrigation efficiency	RIBASIM			
3	measure_2	hard	desalinating water for increased availability	develop later			
4	measure_3	hard	enhance water storage (e.g. new dams)	RIBASIM			
5	measure_4	soft	water allocation improvement	RIBASIM > Ron to check with stakeholders			
6	measure_5	soft	change in livelihoods	check with stakeholders how this affects the weighting in ABM	scale of 1-10 (worst to best)		
7	measure_6	soft	implementation of forecast system for drought	develop later			

	A	B
1	indicators	
2	water availability	RIBASIM Mm3
3	water quality	DEWAQ water treatment
4	rural-urban migration	ABM, % households migrate from rural to urban
5	water security risk	check with Ron and Tinneke thresholds and make categories
6	displacement risk	% of households displaced

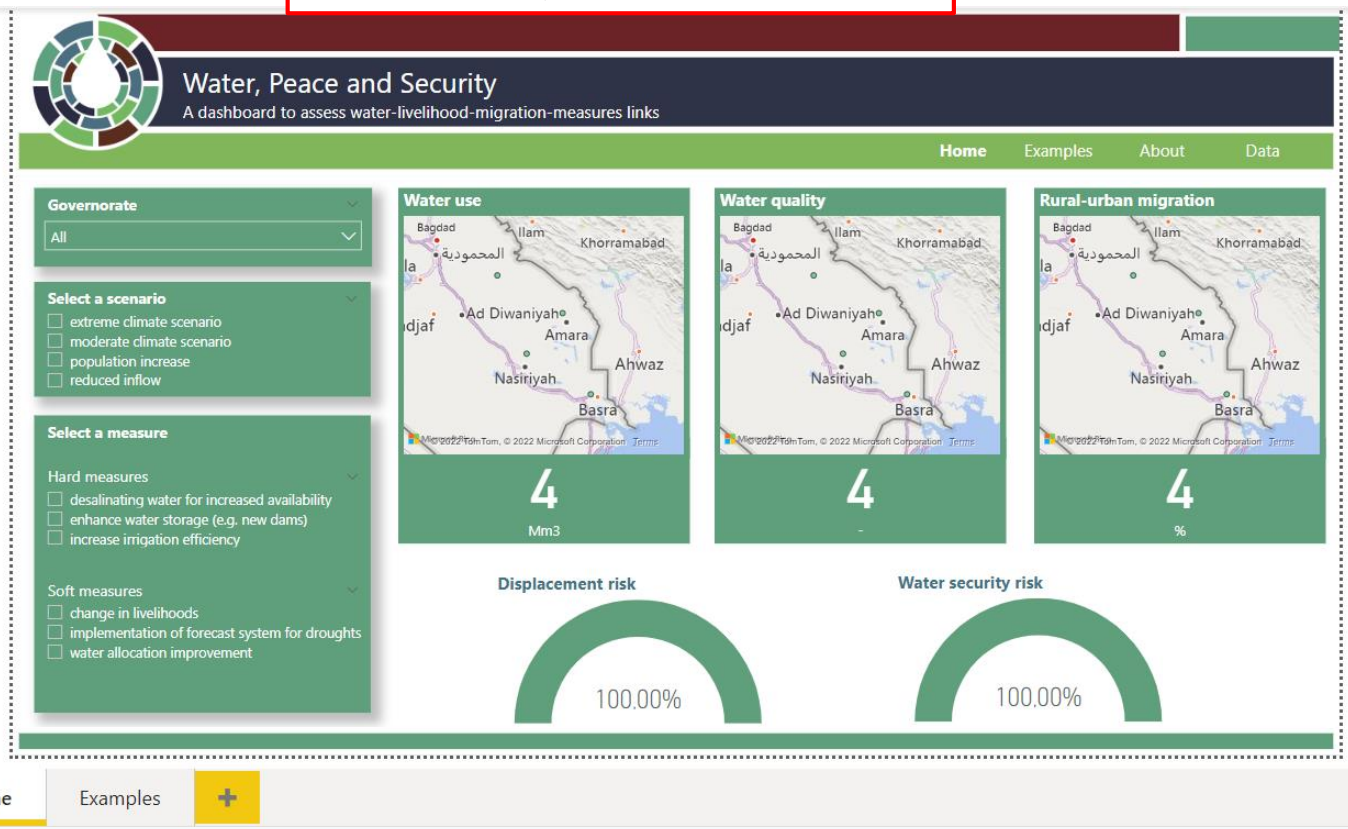
Building the dashboard
using PowerBi

بناء لوحة القيادة

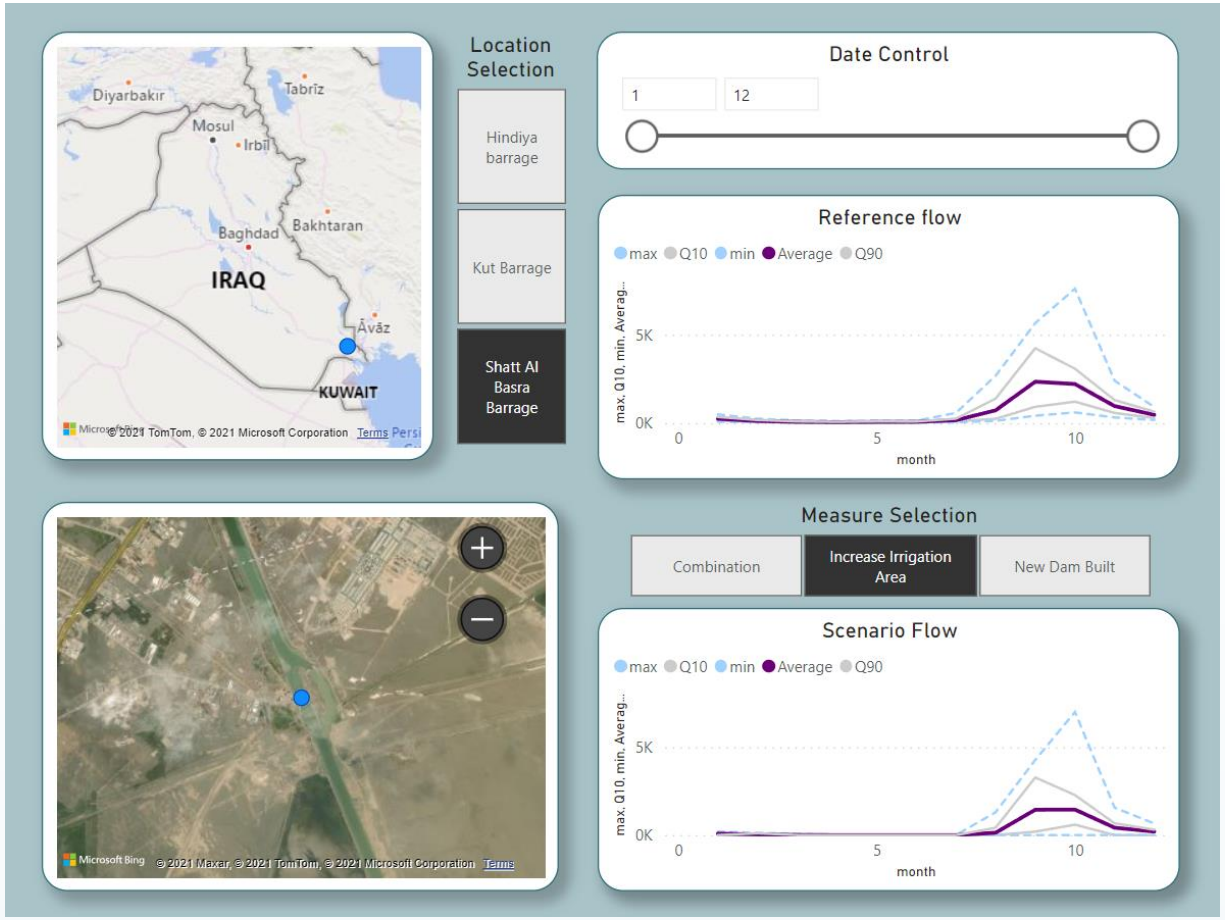
How data is organized
كيف يتم تنظيم البيانات



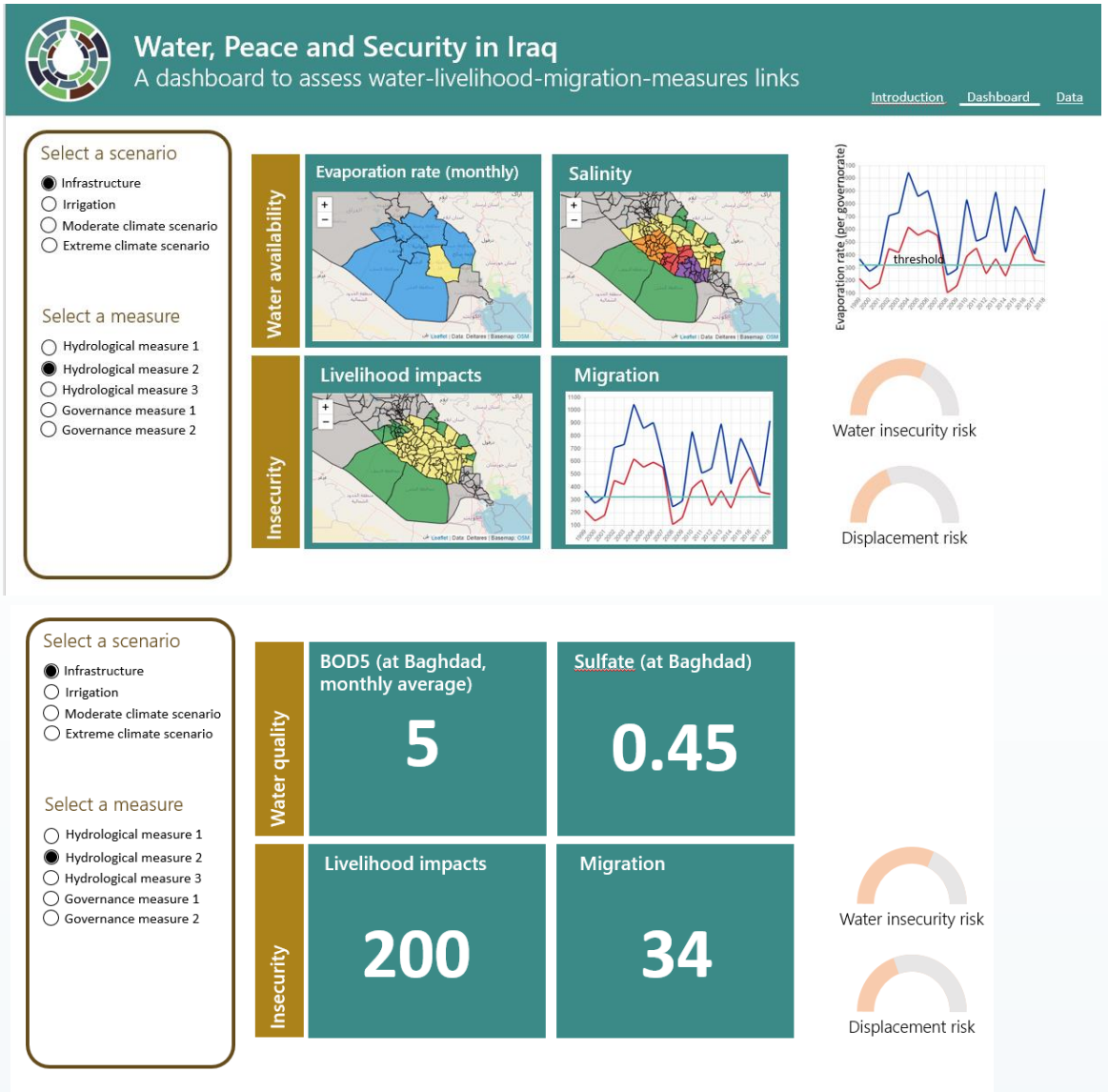
How data is visualized
كيف يتم تصور البيانات



Previous mock-ups



سابق mock-ups



https://bit.ly/iraq-dashboard-mockup

How to use the dashboard

- Once it is ready, you can access the dashboard online
- Select scenarios and measure
- Optional: select a governorate
- Visualize how indicators change with each selection

كيفية استخدام لوحة القيادة

- بمجرد أن تصبح جاهزة ، يمكنك الوصول إلى لوحة القيادة عبر الإنترنت
- حدد السيناريوهات والقياس
- اختياري: حدد محافظة
- تصور كيف تتغير المؤشرات مع كل اختيار

Water, Peace and Security

A dashboard to assess water-livelihood-migration-measures links

Governorate

All

Select a scenario

- extreme climate scenario
- moderate climate scenario
- population increase
- reduced inflow

Select a measure

Hard measures

- desalinating water for increased availability
- enhance water storage (e.g. new dams)
- increase irrigation efficiency

Soft measures

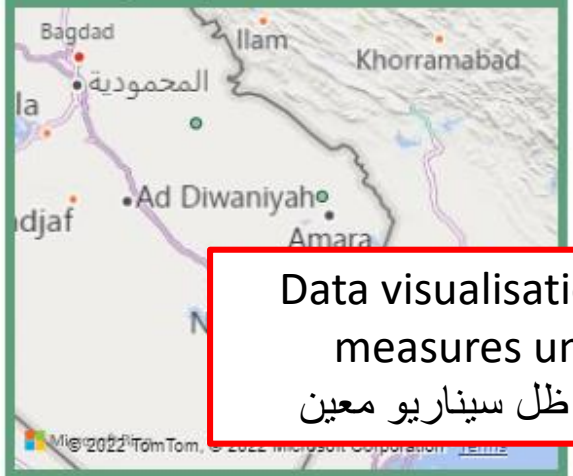
- change in livelihoods
- implementation of forecast system for droughts
- water allocation improvement

Water use

4

Mm3

Water quality



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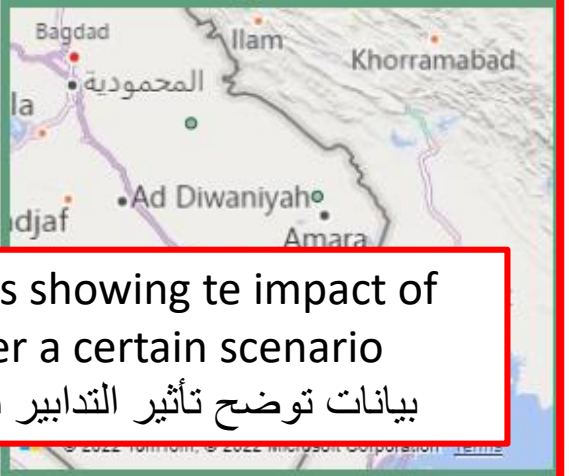
Rural-urban migration



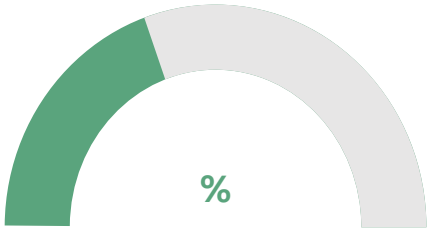
4

%

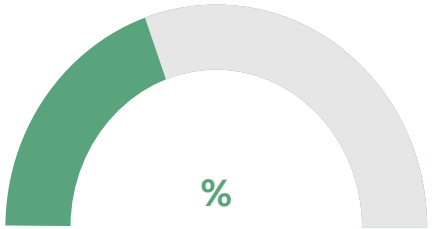
Data visualisations showing te impact of measures under a certain scenario

بيانات توضح تأثير التدابير في ظل سيناريو معين

Displacement risk



Water security risk



Question 3

Which one is more important to you?

- Scenarios
- Measures
- Indicators

سؤال

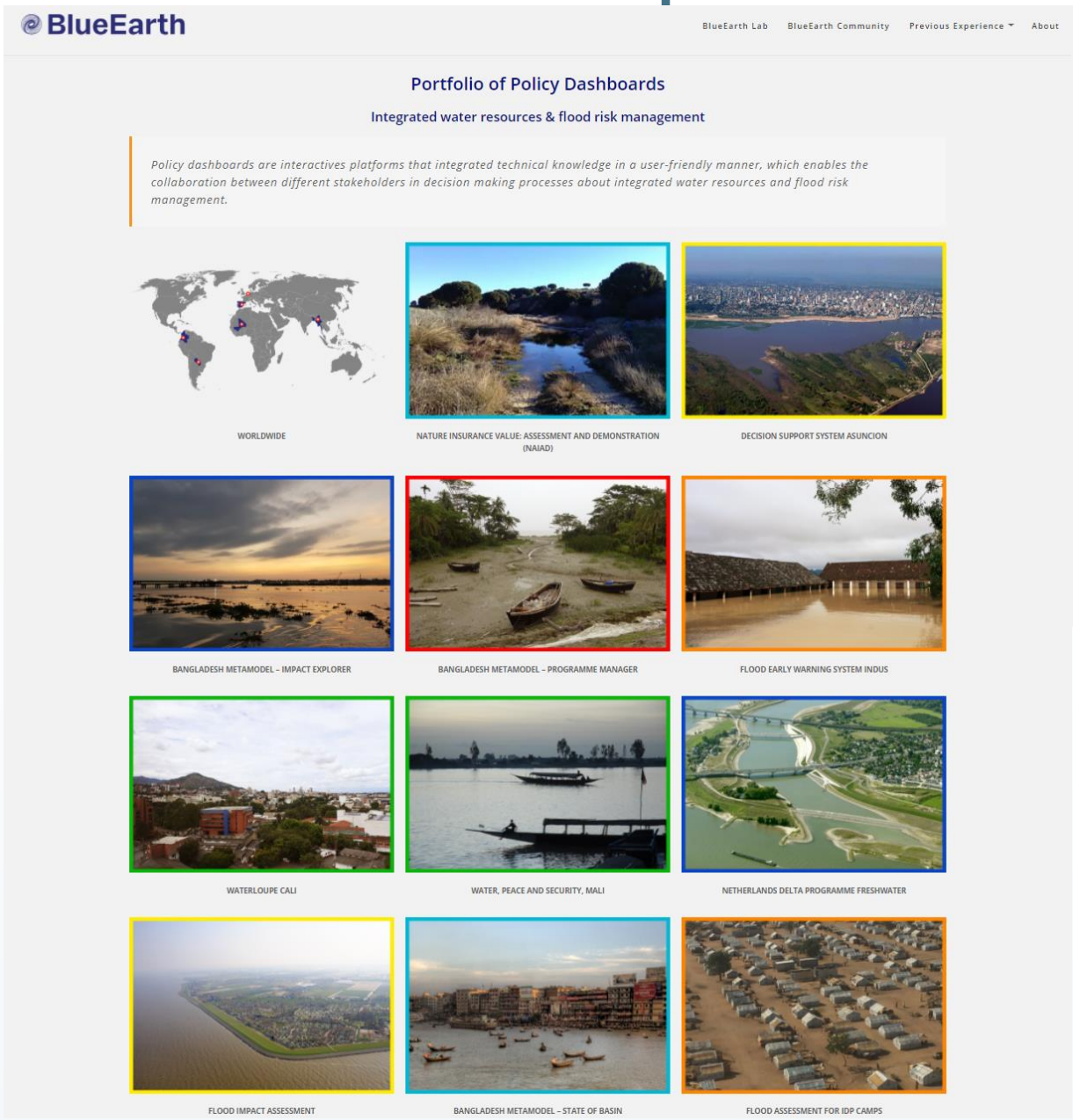
أيهما أكثر أهمية بالنسبة لك؟

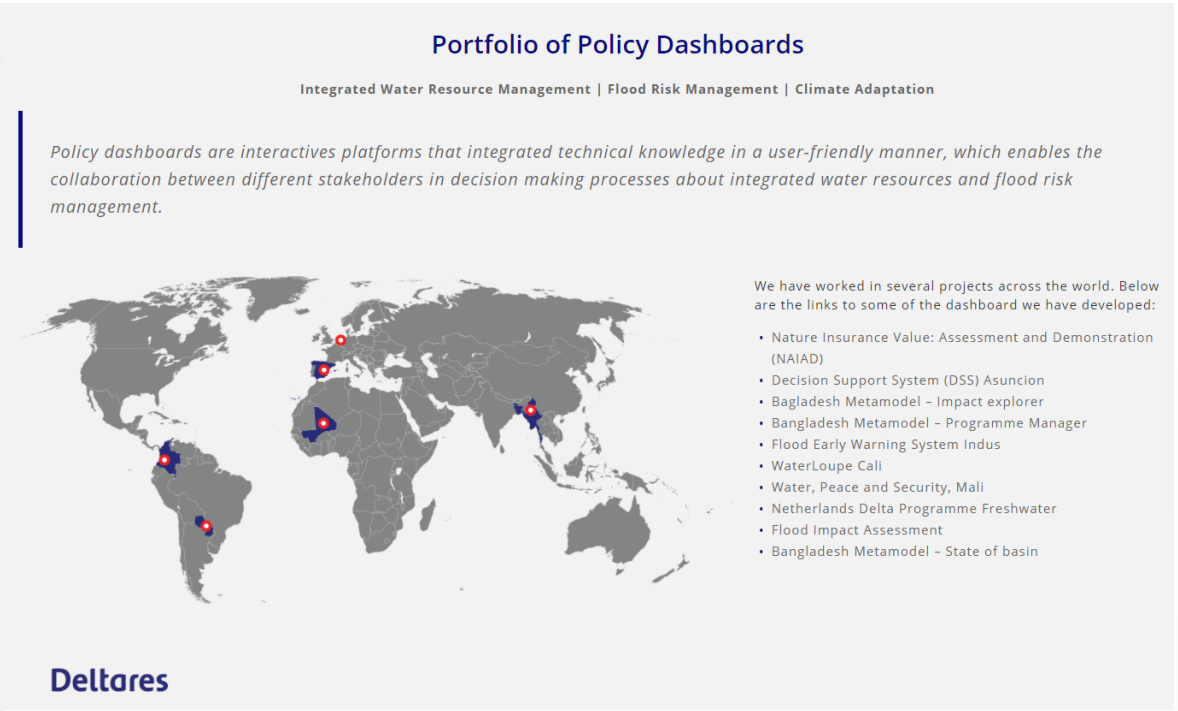
سيناريوهات

تدابير

المؤشرات

Other dashboard examples





https://blueearth.deltares.org/policy-dashboard-portfolio/

Question 4

سؤال

Do you have questions or feedback about the dashboard development?

هل لديك أسئلة أو ملاحظات حول تطوير لوحة القيادة؟