SDC A+FS Network

Food Systems Learning Journey

A learning adventure taking us around the globe to understand and act more systemically

3rd Global Seminar

The Central, South & South East Asia Regional Workshops

Thematic linkages: Disaster Risk Reduction, Water and Climate Change

2 Intro webinars

Webinar Jan '23

Webinar Jan '23

Webinar Apr '23

Webinar May '23

Summative event June '23

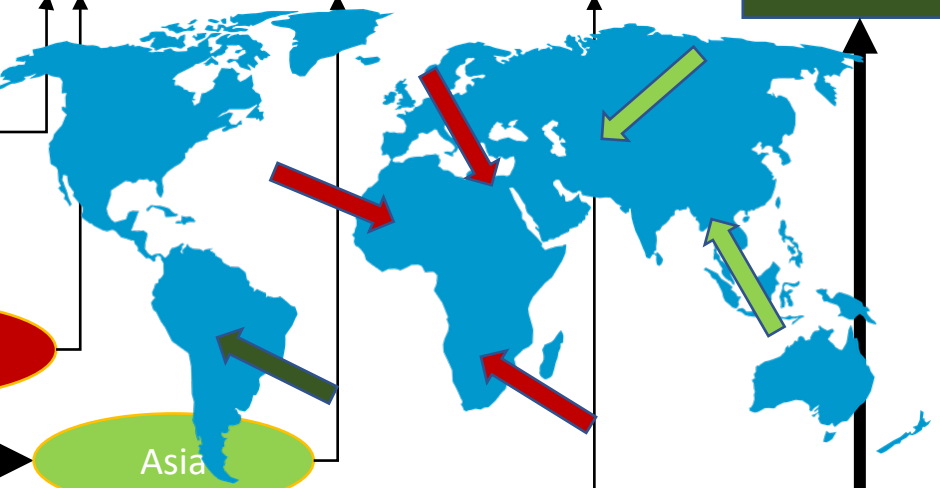
W. Africa

MENA

S/E-Africa

Asia

L. America



Regional workshop

Network webinar

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Purpose of the FSLJ Regional Workshops

To provide a 'learning-by-doing' method where SDC staff and partners jointly identify the strengths and challenges, and the potential direction and/or steps forward, towards more sustainable and resilient food systems.

⇒ A common understanding of food systems

⇒ Strengthen ties at the regional levels, beyond the national boundaries, between the SDC cooperation offices and with the partners

⇒ Provide a roadmap for SDC and partners on how to contribute to sustainable food systems in the years to come including an understanding of global and regional priorities

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The Central Asia and South & South-East Asia Regional Workshops

Welcome, SDC objectives and purpose and plans of the FSLJ

Oyture Anarbekov, IWMI Researcher and Country Manager, Uzbekistan
Key challenges facing Central Asia's food systems: the impact of climate change on the region's water resources

Pongtip Thiengburanathum, Researcher, Chiang Mei University, Thailand
Food Systems in South-East Asia background and Thailand: Climate Change and DRR

Mila Lomarda, DRR Specialist at the Swiss Embassy DRR Hub, Bangkok
The DRR equation

John Ingram, Head of Food Systems Transformation Team, Oxford University
1. Application of the Food Systems Approach to DRR
2. Methods and learnings from the Central Asia and South/South-East Asia FSLJ Workshops

Discussion

Where do we go next? (webinar 4th May)

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Key challenges facing Central Asia's food systems: the impact of climate change on the region's water resources

Oyture Anarbekov

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International Water Management Institute

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

CGIAR

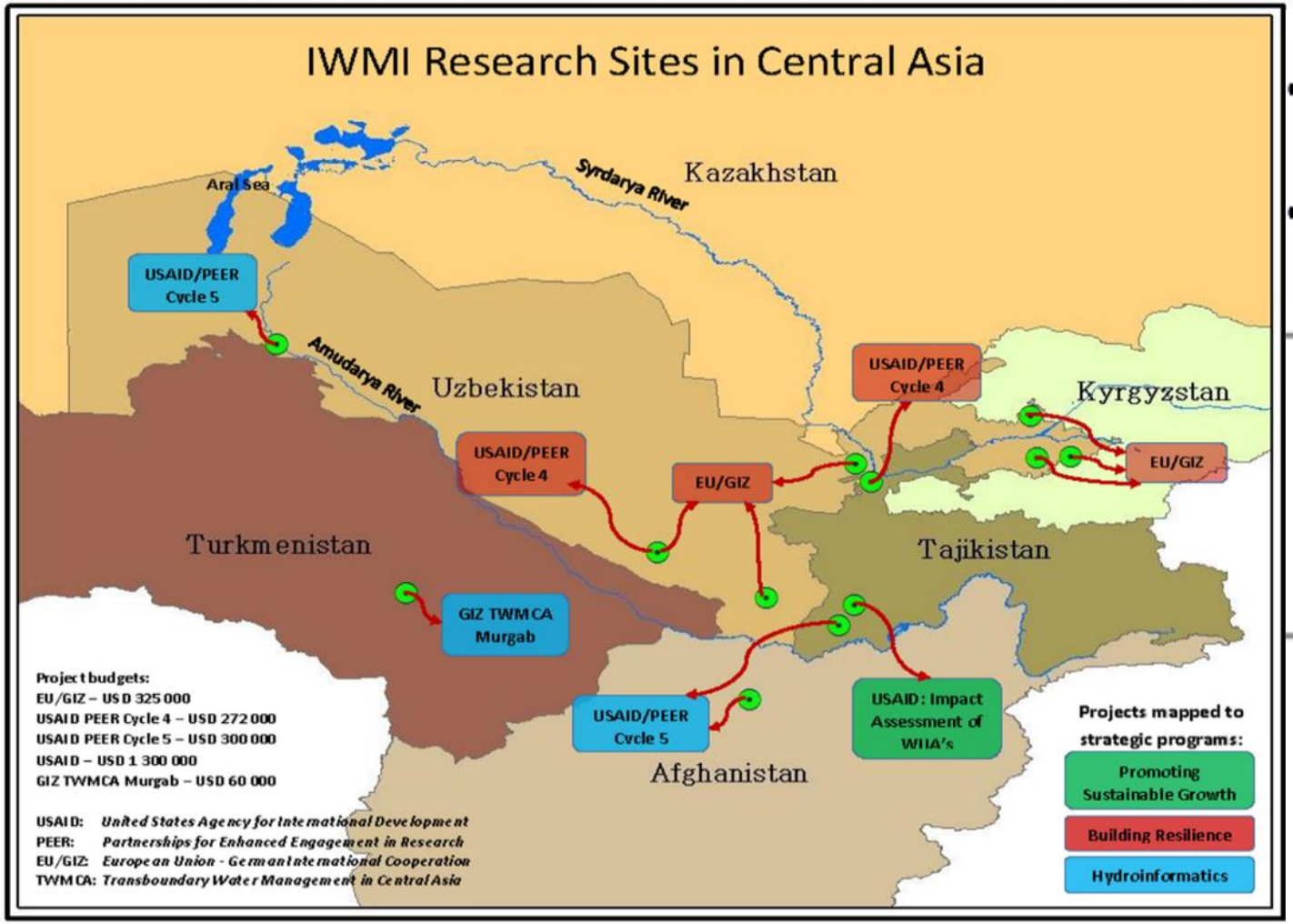
Food Systems Learning Journey

Water challenges across Central Asia including climate change and its impact for food security

Mr. Oyture Anarbekov, IWMI-CA
Apr 05 2023 – Tashkent, Uzbekistan

Innovative water solutions for sustainable development
Food · Climate · Growth

IWMI – operates since 2001 in CA



Strategy 2019-2023

- WATER SAVING TECHNOLOGIES
- WATER ACCOUNTING FROM FARM TO BASIN

- CLIMATE CHANGE ADAPTATION
- DROUGHT RESILIENCE

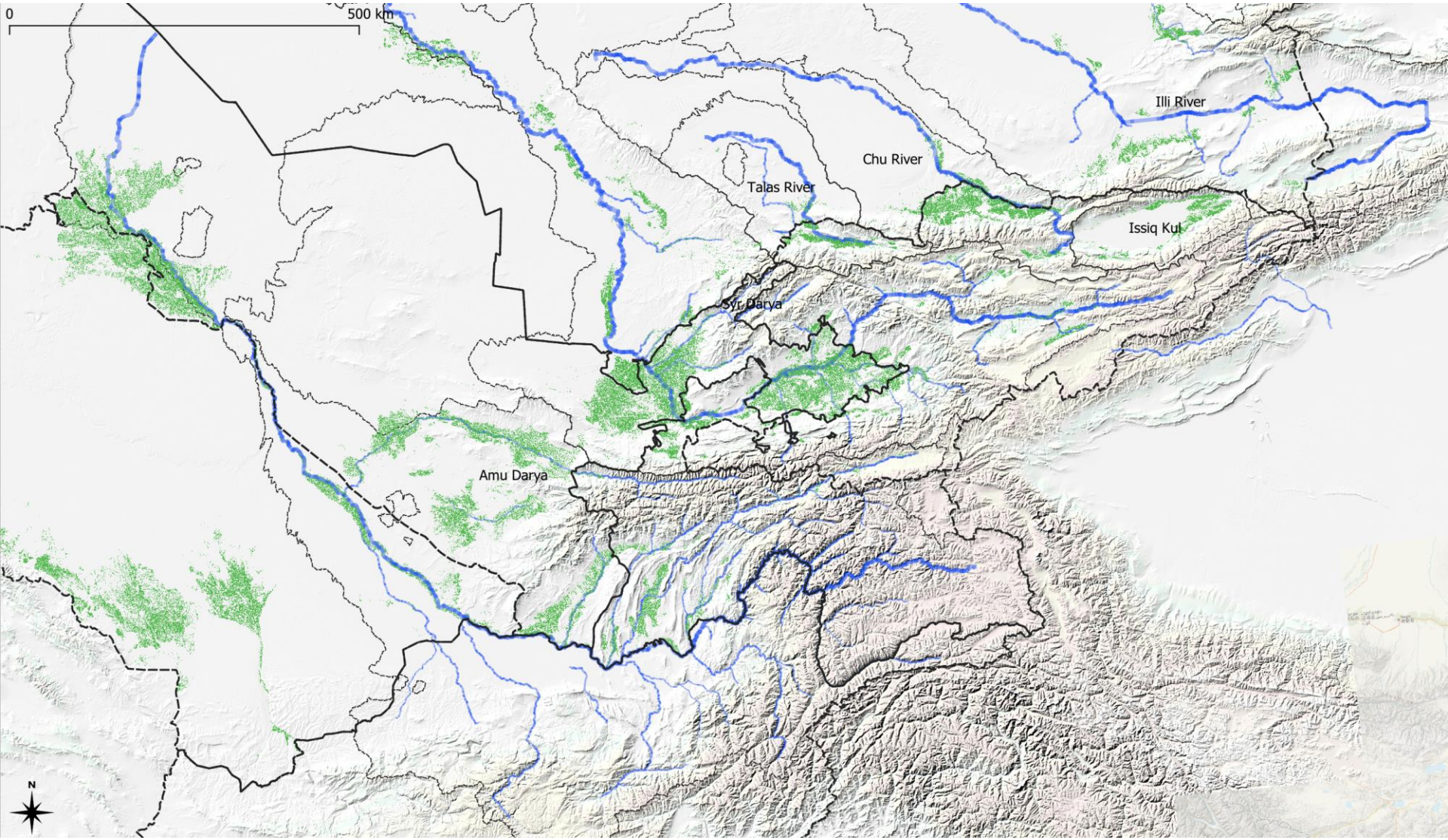
- CIRCULAR ECONOMY
- ECONOMIC IMPACT ASSESSMENT

DIGITAL INNOVATION
INSTITUTIONAL STRENGTHENING
TRANSBOUNDARY COOPERATION

MAJOR RIVER BASINS IN CA

Source: Source: Climate Volatility and Change in Central Asia: Economic Impacts and Adaptation, Mirzabaev A.. 2012.

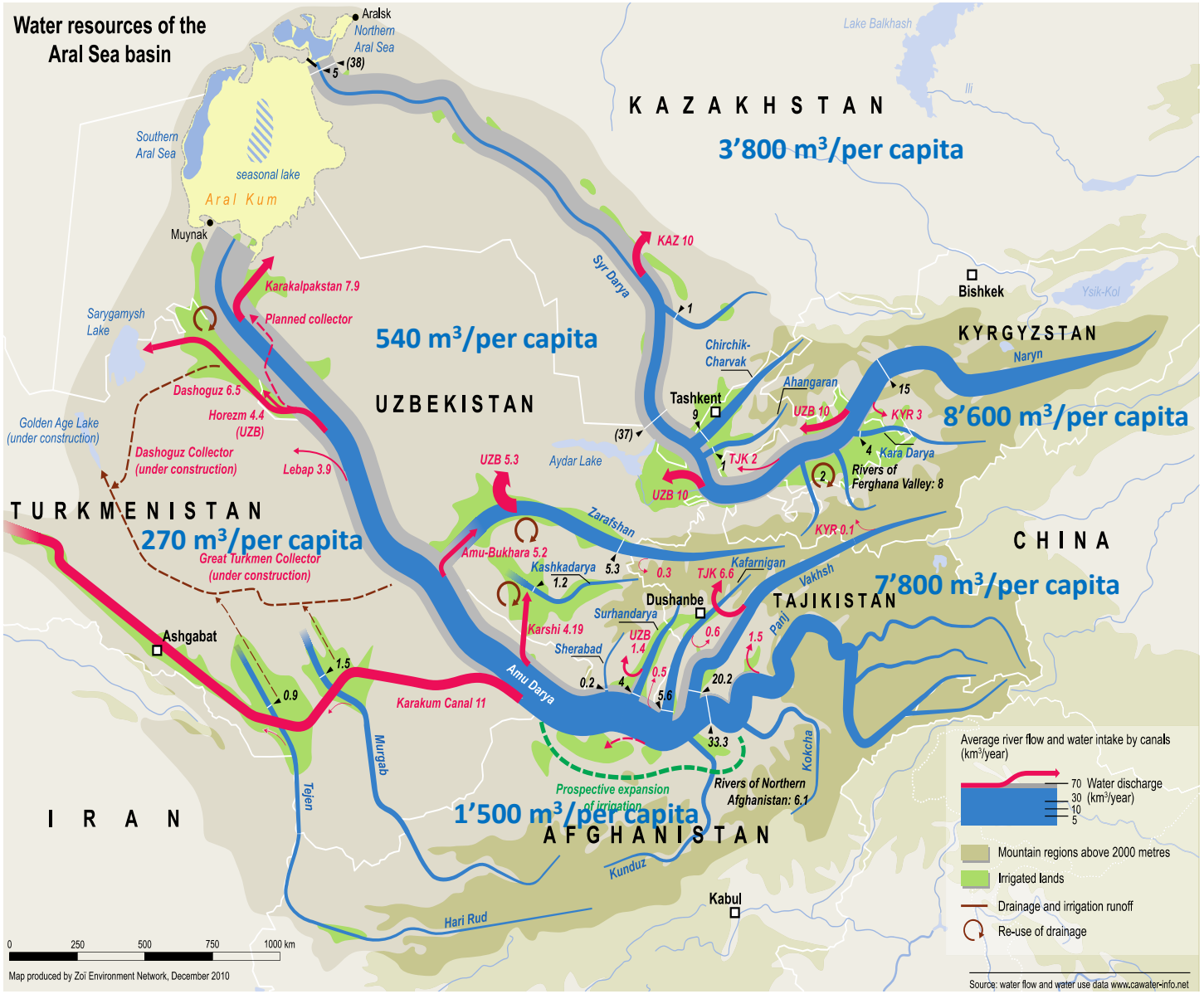
Central Asia Region irrigated areas



Water Resources

Main Rivers:

- Syr Darya: ~ 37 km^3/a
- Amu Darya: ~ 74 km^3/a
- Discharge contributions:
  - 80 % annual snowmelt
  - 17 % liquid precipitation
  - 3 % glacier melt
- Per capita water distribution shows significant discrepancies between up- and downstream



Amudarya river basin

Source: Amudarya Basin Network: www.amudaryabasin.net

- Amudarya with its tributaries is approximately 2,620 km long, ranked 34th among the world's longest rivers
- Irrigated area of the basin is 5.76 mln ha
- Population in the basin is increasing at rapid pace. It is expected to reach 60 mln in 2025
- 77% of its surface water is being used for agricultural production
- Irrigated agriculture of the basin provides about 30% of the basin countries GDP
- Agriculture is responsible for:

a) **Afghanistan's 33% of GDP**
b) **Tajikistan's 22% of GDP**
c) **Turkmenistan's 12% of GDP**
d) **Uzbekistan's 20% of GDP**

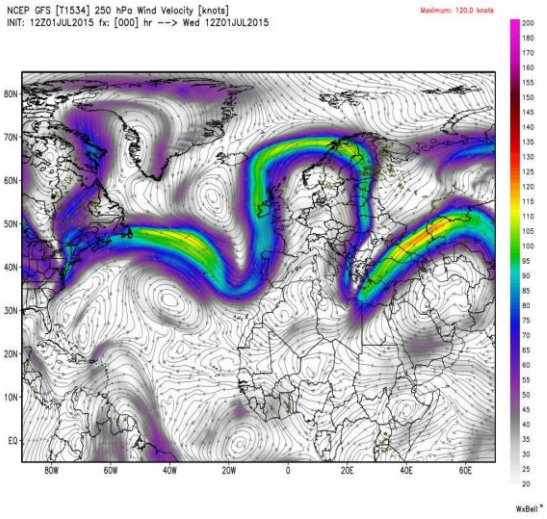
- Cotton is the dominant crop.

Climate

Dry, continental climate with hot summers and cold winters.

On average, > 50 % of annual precipitation falls as snow during boreal winter (November – March), particularily in the mountain regions.

Rossby Waves (ridge and troughs) visualized by jet stream band.



Weather Types (WT):

- Wet anomalies: *
- Dry anomalies: #

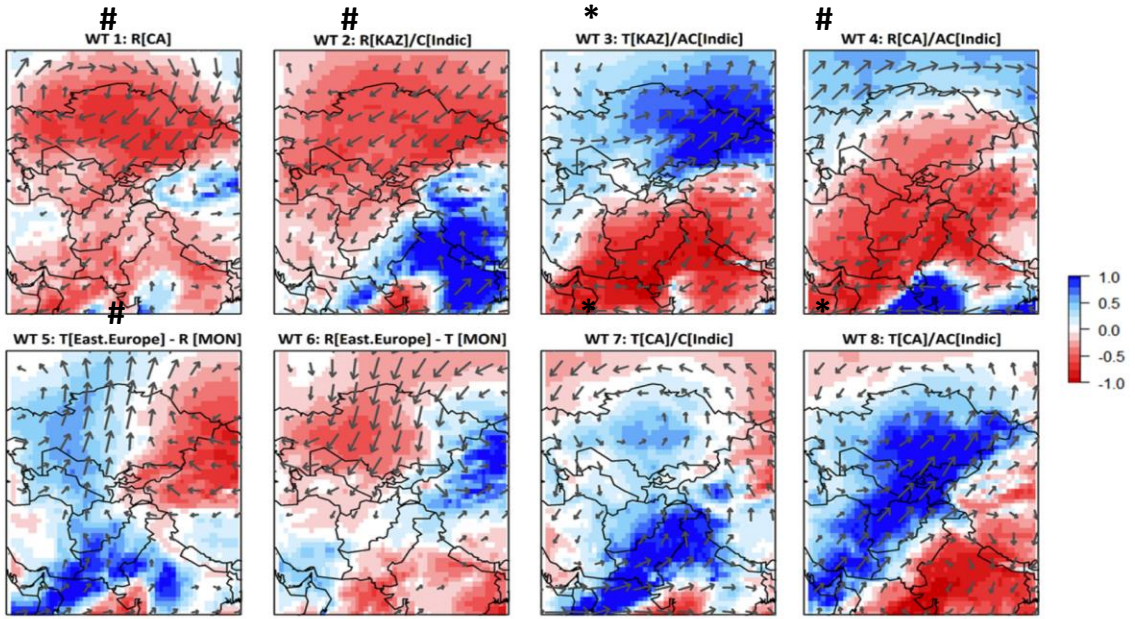


FIG. 11. Composite maps illustrating the averaged anomalies of ERA-Interim/Land 6-hourly precipitation sums for each weather type. Values are depicted relative to the seasonal mean 6-hourly precipitation sum [% $(100)^{-1}$] for each grid cell, respectively. Arrows indicate anomalies of vertically integrated moisture fluxes.

Source: Gerlitz et al., 2018

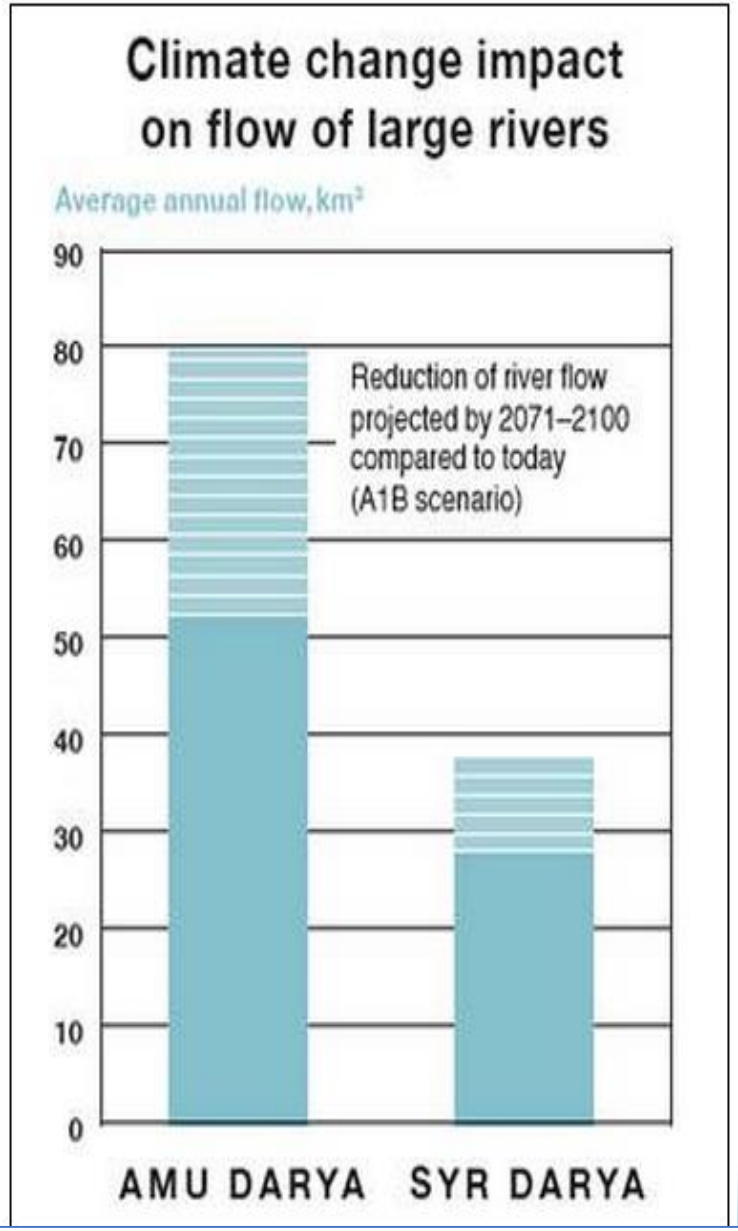
ARAL SEA BASIN & CHANGE OF THE ARAL SEA BOUNDARY

is among the most ancient centers of civilization, especially in irrigation

Amudarya and Syrdarya — two main rivers in the basin,
Its tributaries Vakhsh, Pyandj, Zerafshan, Naryn, Chirchik, Karadarya and Small Transb rivers.

CHALLENGES – CLIMATE CHANGE FOR CA

- Reduction in river run-off in summer due to temperature increase and increase in run-off in winter due to precipitation increase
- Since about 1950, between 14% and 30% of the Tian Shan and Pamir glaciers have melted
- Experts estimate that the flow of the Amu Darya might be reduced by 7% to 15% by 2050, and the Syr Darya by 5%
- Between 1970 & 2000, the discharge of the Amu Darya was reduced ten-fold

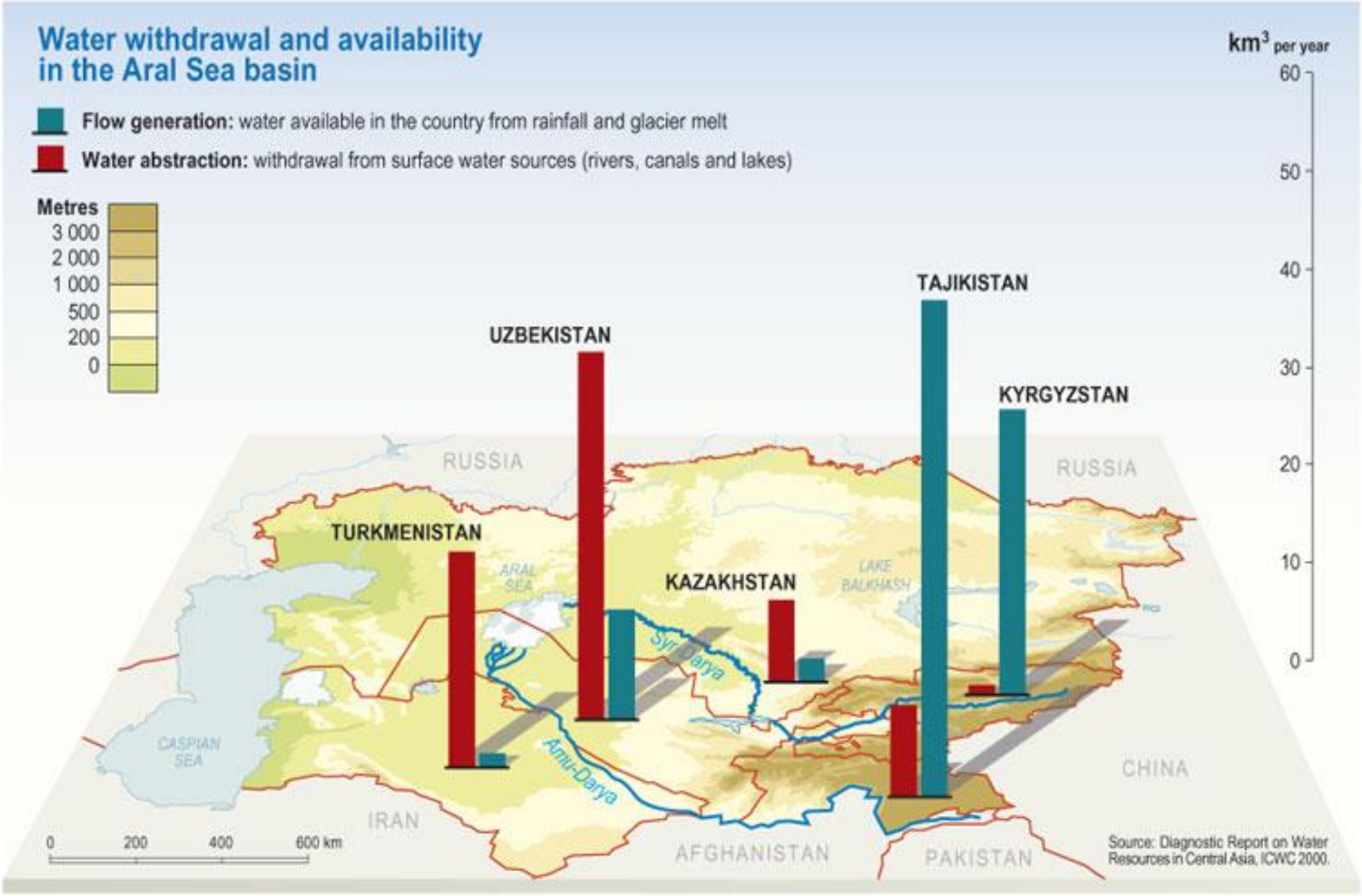


Source: http://www.waterunites-ca.org/book.html

Water withdrawal and availability in the Aral Sea basin

Flow generation: water available in the country from rainfall and glacier melt

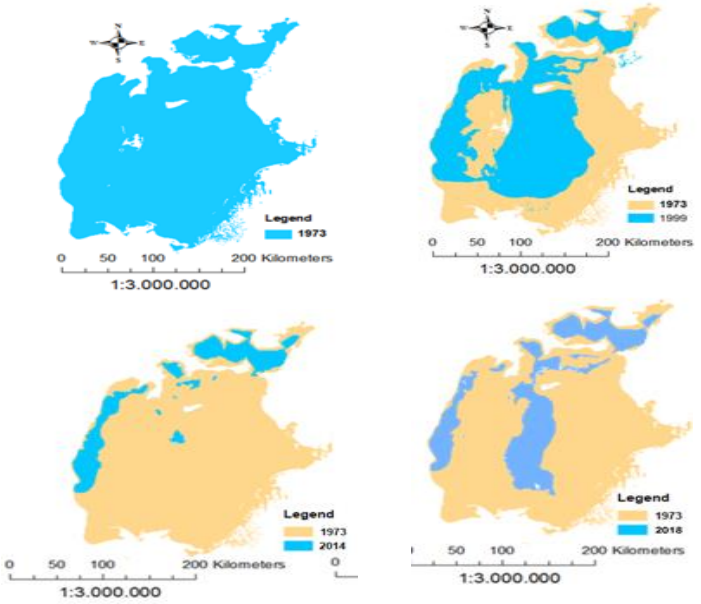
Water abstraction: withdrawal from surface water sources (rivers, canals and lakes)



MAP BY VIKTOR NOVIKOV AND PHILIPPE REKACEWICZ - UNEP/GRID-ARENDAL - APRIL 2005

Regional challenges in the Basin

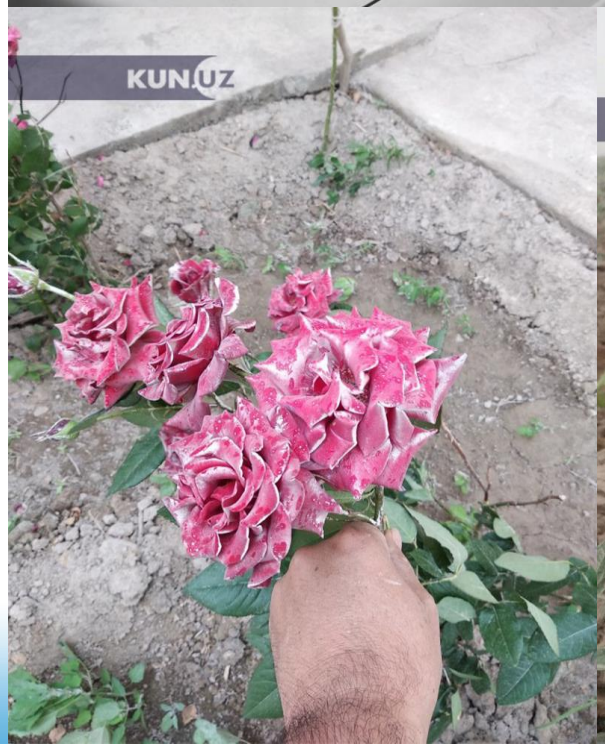
- Growing populations
- Land degradation: salinization and waterlogging
- Climate change – frequency of drought years and flood years increased
- Outdated irrigation and drainage infrastructure – water losses
- Poor water use efficiencies
- Water quality
- Water governance
- Water-energy-food interdependencies
- Data availability and data quality
- Transboundary cooperation



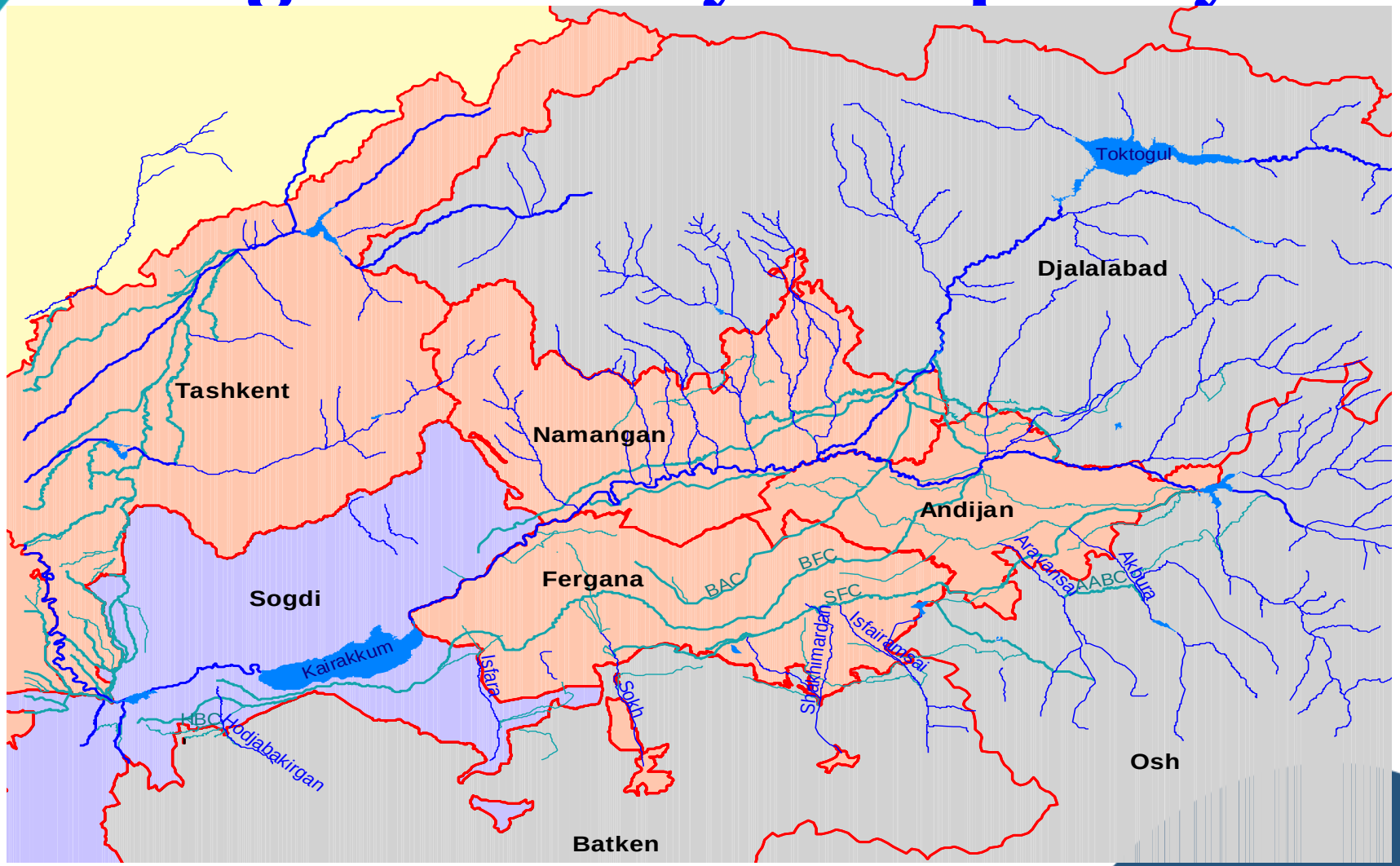
Countries in Central Asia

Country	Population (2020)
Uzbekistan	33,469,203
Kazakhstan	18,776,707
Tajikistan	9,537,645
Kyrgyzstan	6,524,195
Turkmenistan	6,031,200

SALT MOVEMENT FROM ARAL SEA - MAY 27.2018
NOVEMBER 4, 2021 THE CONCENTRATION OF DUST IN TASHKENT'S AIR WAS 30 TIMES THE PERMITTED LEVEL

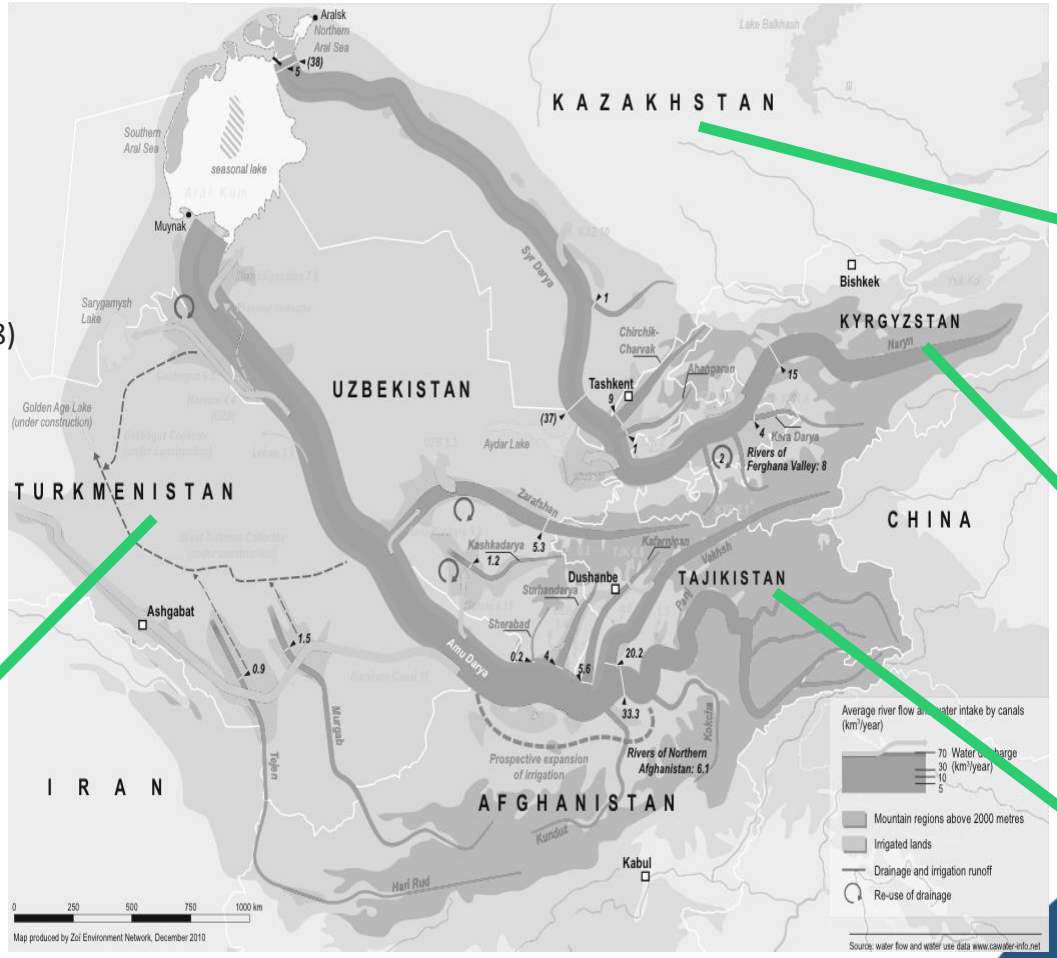


Main canals and small rivers in Ferghana valley: complexity



International Water Management Institute

CENTRAL ASIA: REDUCTION IN NUMBER OF HYDRO- & AGRO-METEOROLOGICAL STATIONS



Kazakhstan

- 35% since 1985 (by 2008)

Uzbekistan

- 15% since 1985 (by 2008)

data based on estimates

Kyrgyzstan

- 54% since 1985 (by 2008)

Turkmenistan

- 40% since 1985 (by 2008)

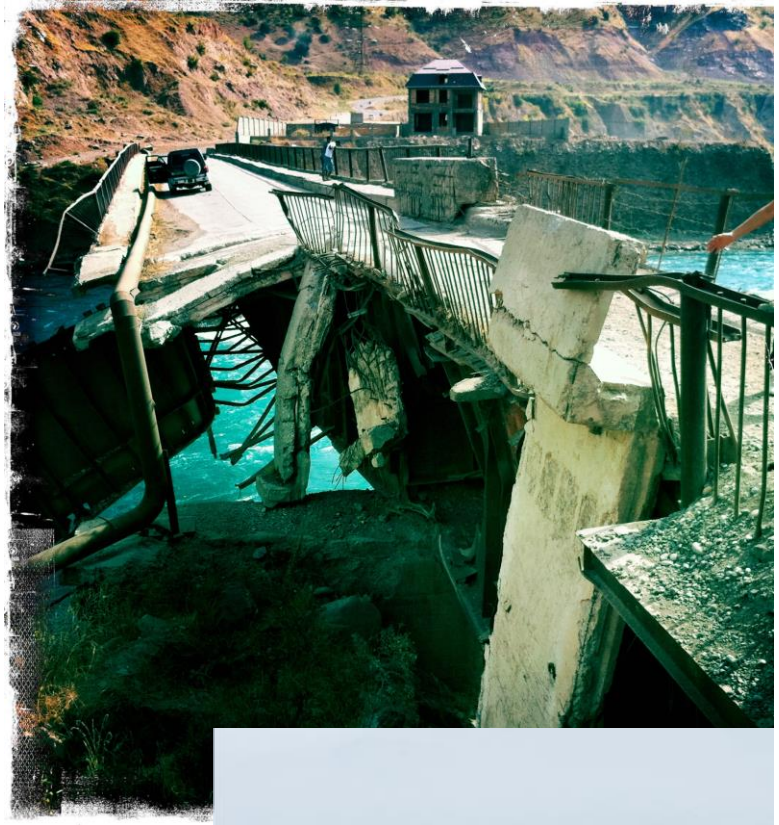
Tajikistan

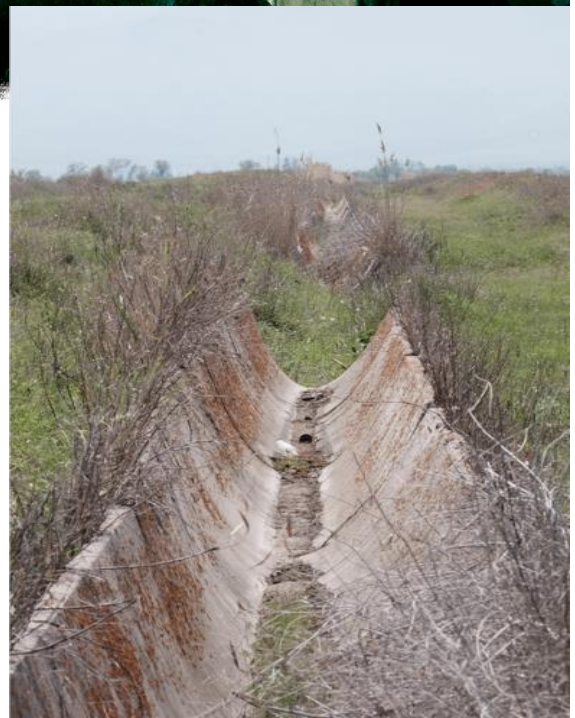
- 37% since 1985 (by 2008)

IWMI International Water Management Institute

CORE CHALLENGES

- **Difficult Cost Recovery**
  - Operation and maintenance of vast infrastructure is challenging
- **Absent Modernization**
  - Analog, ineffective workflows
- **Data**
  - Lack of consistent data records
  - Outdated data (land melioration conditions , etc.)
  - Open-source data not valorized
- **Capacities**
  - Loss of experts & knowledge





Challenges of on-farm O&M in Uzbekistan

- *Outdated infrastructure*
- *Low Coefficiency of efficiency of canals*
- *Water losses*
- *Absence of water control and metering facilities, eyes measurements*
- *Accountability and Transparency*
- *no incentives, ISF area based, questions of full cost recovery*
- *Conflicts and disputes btw WCAs and water users*
- *No linkages btw water use and water charge/Irrigation service fee*

as if 01.04.2019	**Electricity debt**	**Tax debts and other obligatory payments**	**Total**
Total Debt of 1503 WCAs, mln $	16.8	3.46	20.26
	1 USD = 8354 UZS (Source: Ex Rate Oanda.com)		

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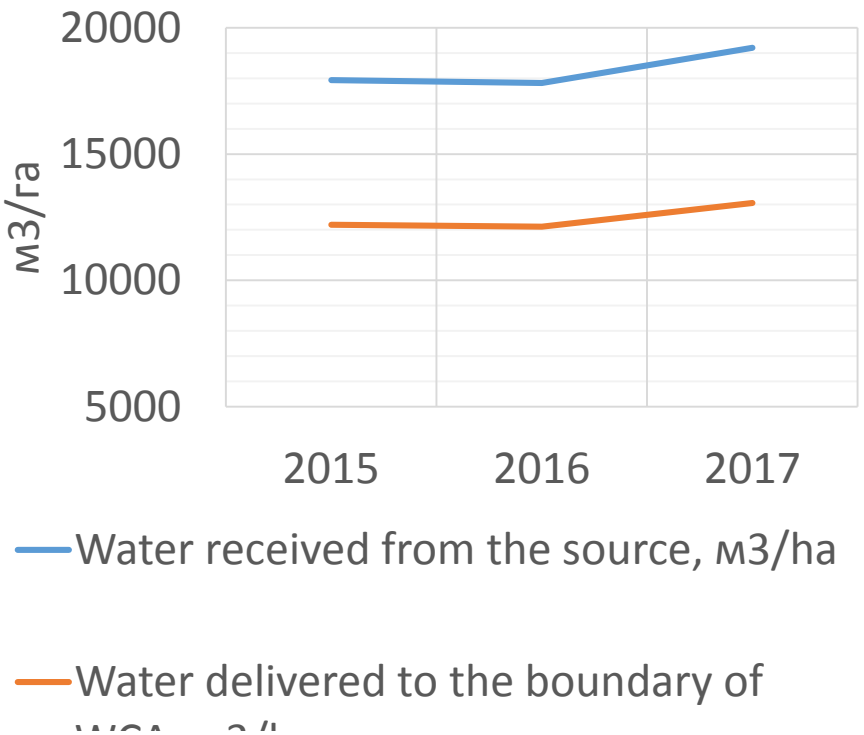
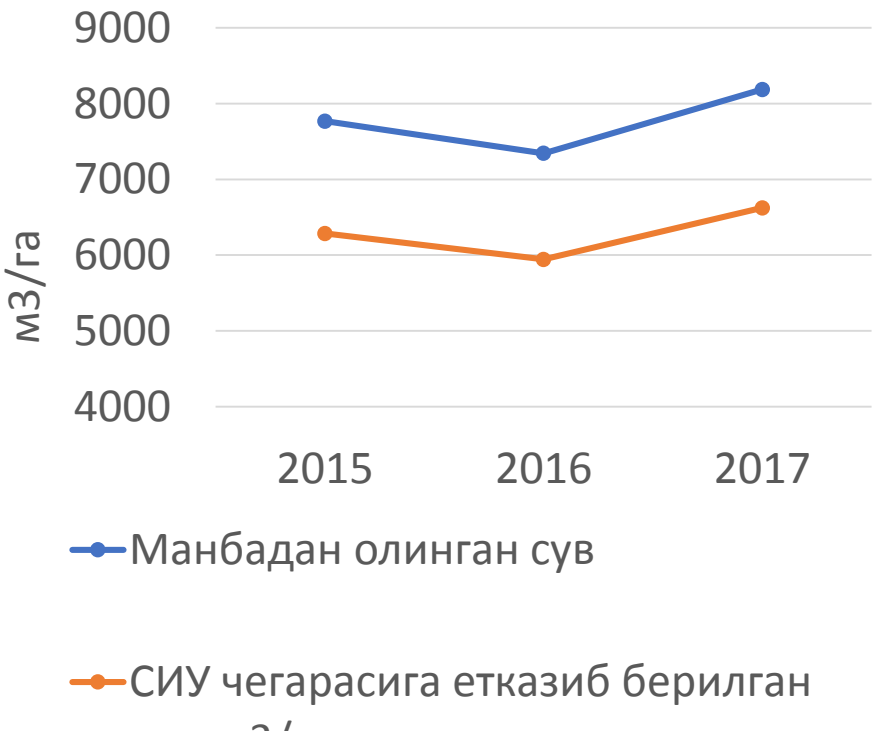
The average volume of water delivered from the source and delivered to the WCA boundary (m3/ha)

In **Shakhrixansay** irrigation system, the average volume of water delivered from the source and delivered to the WCA boundary (m3 / ha)



In Aksu basin, The average volume of water delivered from the source and delivered to the WCA boundary (m3 / ha)

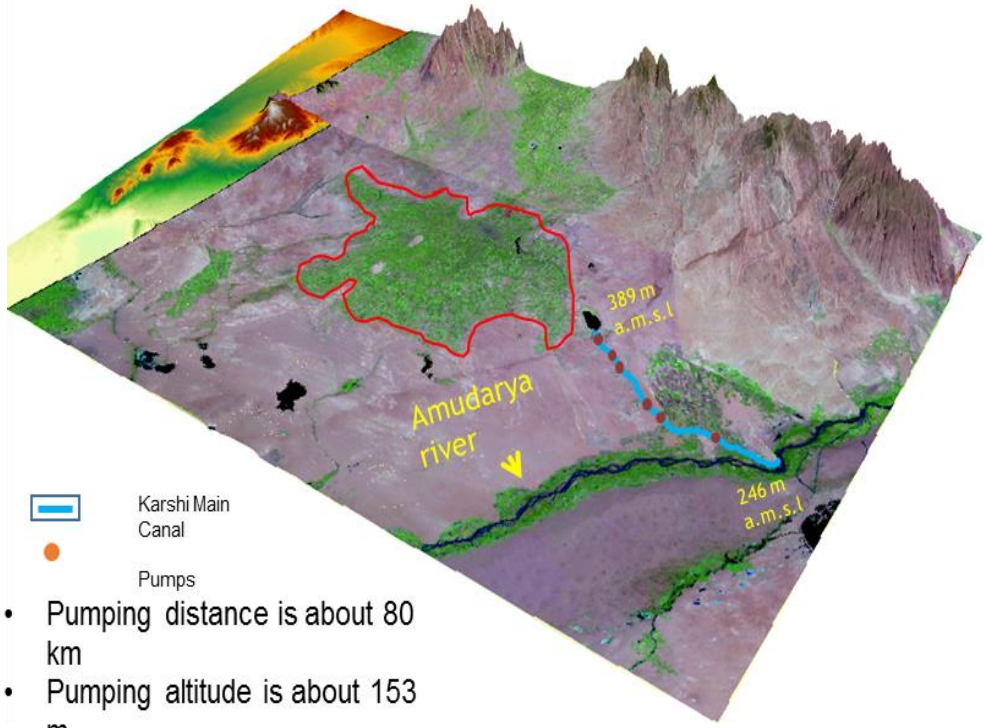


Lack of WEF Nexus approaches results in high energy and water use in agricultural production

- ✓ Central Asia is known with its large pump stations, where the **water is lifted to large scale irrigation systems** from both Amudarya and Syrdarya rivers.

- ✓ 2.2 million hectares land out of 4.3 million hectare under pump irrigation. **70% of pump units outdated and have low efficiency**. About **21% of generated energy of Uzbekistan** is used for pump operations

- ✓ Sogd province of **Tajikistan** 70% of irrigated area under lift irrigation in Syrdarya basin and **16% of energy of Tajikistan.**



- Pumping distance is about 80 km
- Pumping altitude is about 153 m
- Irrigated area is about 335,000 ha

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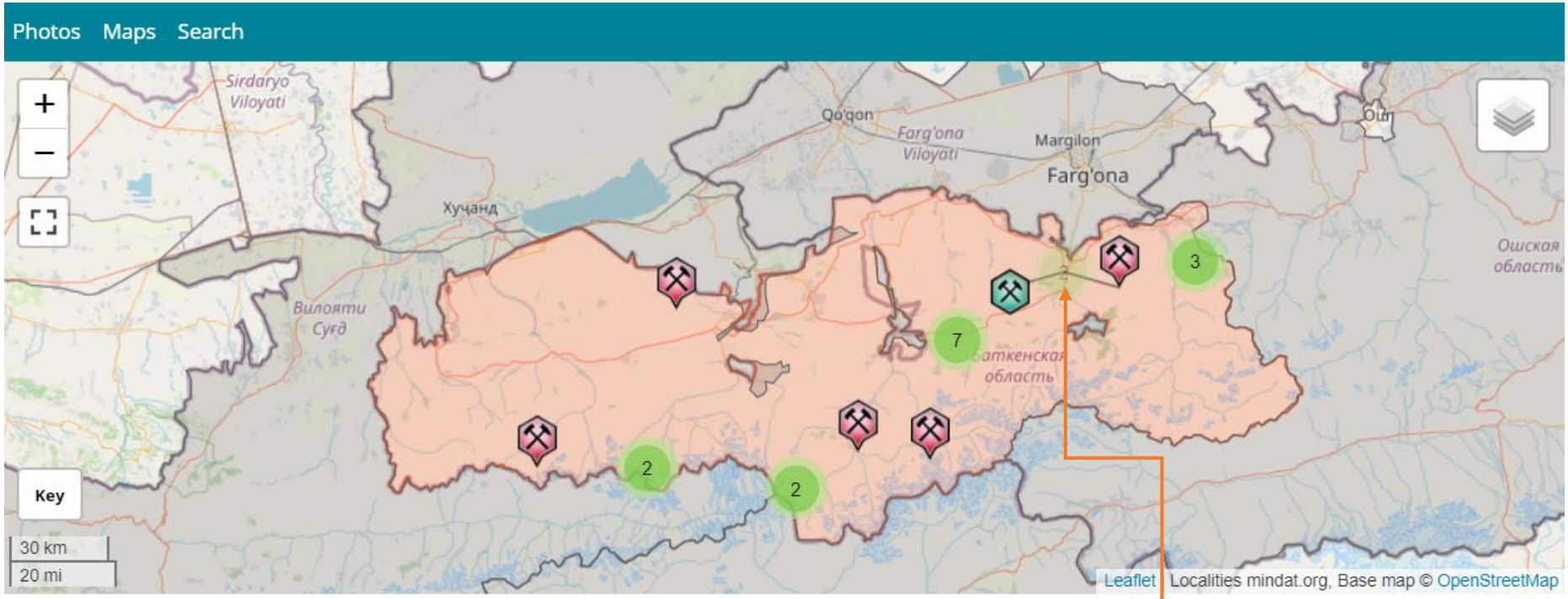
RETURN FLOW BACK TO AMU DARYA FROM LIFT IRRIGATION SCHEME

Source: Avezmuradov,2002

Uranian tailings issues in Central Asia

International Water Management Institute



Köppen climate type:	BSk : Cold semi-arid (steppe) climate		
Nearest Settlements:	**Place**	**Population**	**Distance**
	Shohimardon	5,100 (2012)	16.7km SSE
	Fergana	164,322 (2014)	30.7km NNE
	Quvasoy	32,024 (2015)	30.8km NE
	Yangi Marg'ilon	14,114 (2015)	34.8km N
	Kirguli	20,459 (2015)	36.1km N

- Chauvai Sb-Hg Deposit, Batken Region, Kyrgyzstan
- Kadamzhay Mine, Kadamzhay ore field, Batken Region, Kyrgyzstan

https://www.mindat.org/loc-107621.html

Challenge in Digital Innovation

Climate change and variability is a key challenge in the CWANA region and will increasingly affect people's livelihoods, food systems and environment.

At the same time, **innovative climate risks mitigation solutions** are rarely scaled and **digital agriculture** lags in the region.

Producers, especially smallholder farmers often **lack access to adequate climate risks information management tools and services** & they are rarely scaled due to the **lack of a conducive environment and lack of private sector participation**.

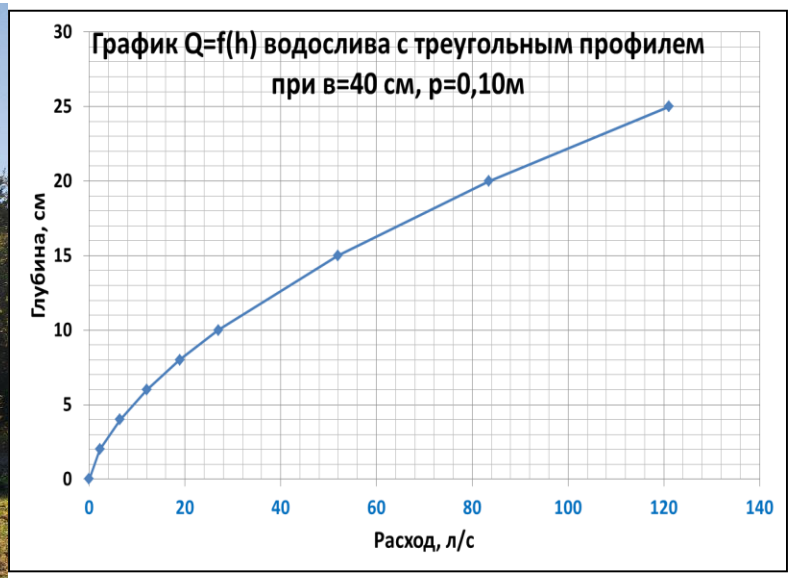
CWANA Region **lags in its investment in digital infrastructure and lacks the enabling environment** to support agricultural innovations.

It is required to build on **strengths of existing digital innovations** as well as new **set of data, platforms, linking location focus and geographies with integrated solutions**.

Digital Innovation for Climate-Resilient Agriculture

Introduction of Solar powered irrigation in the context of CA

INTRODUCTION OF CROWED-SENSED, LOW-COST WATER MEASUREMENT DEVICES AT WCA LEVEL



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Swiss Agency for Development and Cooperation SDC

Programme funded by the EUROPEAN UNION

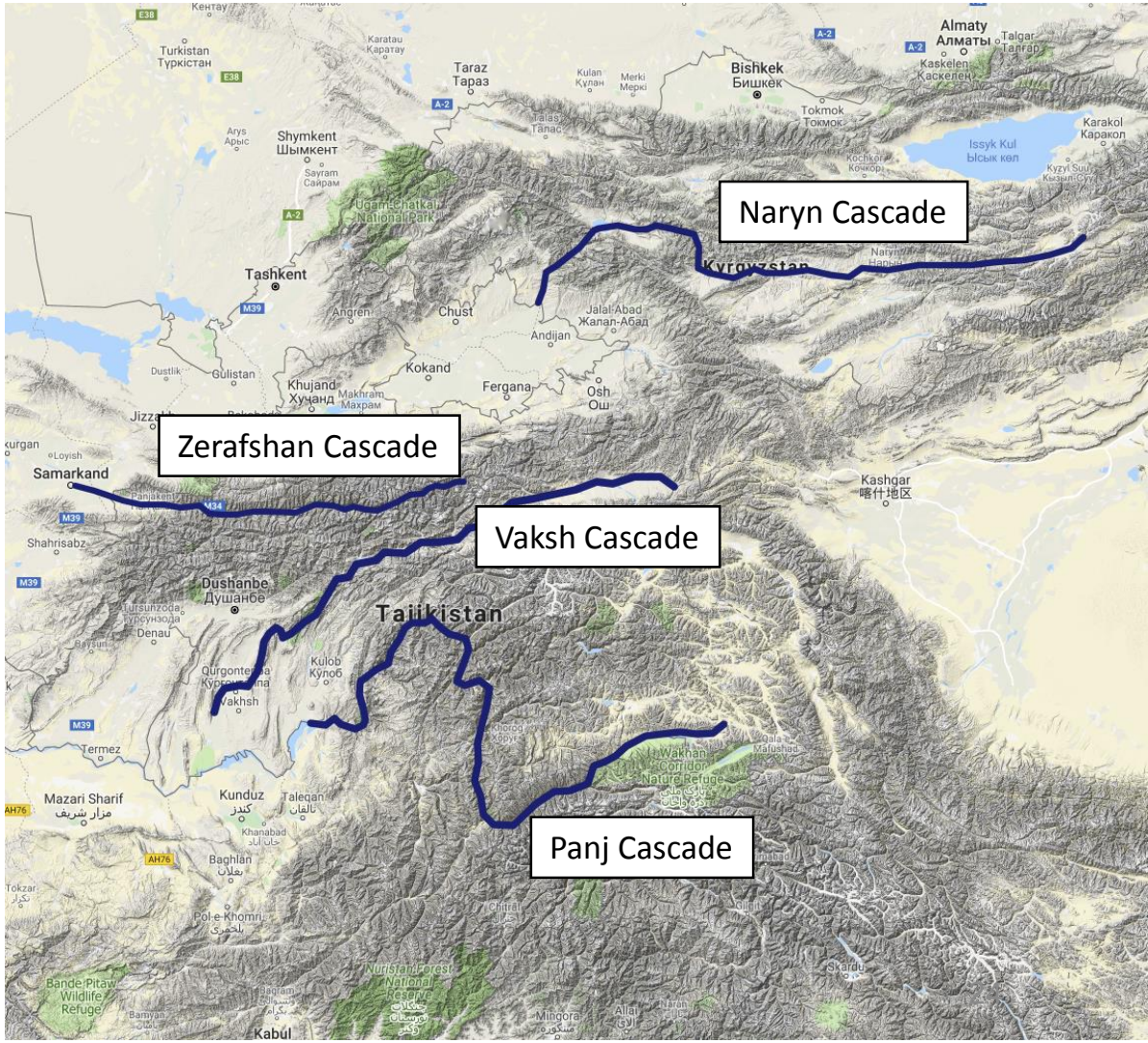
germaniya hamkorligi
DEUTSCHE ZUSAMMENARBEIT

Ijrochi:
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

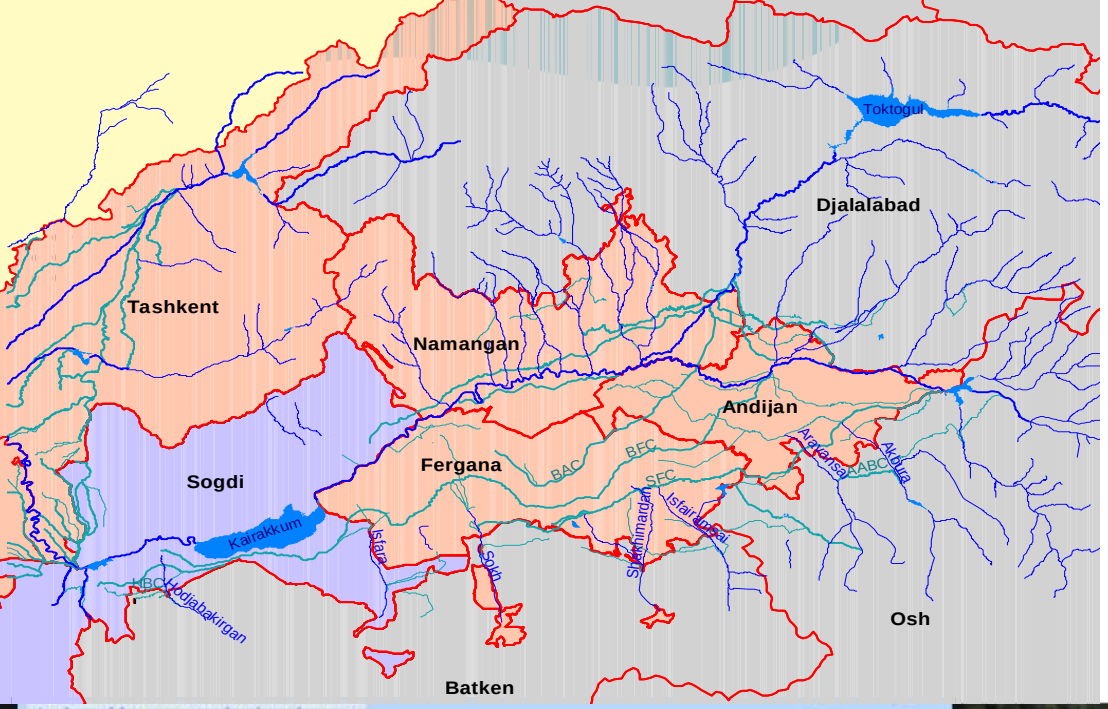
WMI

Central Asia Hydropower Potential

- CA Total Hydro Electric Potential: 524 GW, located in Tajikistan and Kyrgyzstan
- CA currently installed capacity: 43 GW, approx.
- Vision to complete constructions of hydropower cascades and export generated electricity to South Asia (CASA 1000 Project)



Demonstration of innovative and sustainable hydropower solutions targeting unexplored small-scale hydropower potential in Central Asia (Badam & Shahimardan)



Afghanistan -Amu Darya River Situation with the availability of water in Central Asia

Afghanistan is rapidly building a huge canal to draw water from the Amu Darya River. This could potentially affect the water availability situation in Uzbekistan and Turkmenistan. The Kosh-Tepa canal, named after the Kosh-Tepa district in Jowzjan province, will be 285 km long and 100 meters wide. It will be designed to irrigate 550,000 hectares of land (1.35 million acres, or 5,500 square kilometers).

More than half of the work on the first stage has been completed, and this 100 km stage will be ready by June 2023, about two months ahead of schedule.

Riparian Country	Generated Average Annual Flow in million m^3	Share of Total Average Annual Flow in Percent
Tajikistan	50,000	62.5%
Afghanistan	22,000*	27.5%
Uzbekistan	5,000	6.3%
Kyrgyzstan	1,500	1.9%
Turkmenistan	1,500	1.9%
Total	**80,000**	**100**

* the amount of 22,000 million m3 shows the amount of water generated in Afghanistan, out of which an estimated amount of 5,000 million m3 is used inside Afghanistan for agriculture purposes.
Source: Author"s estimates adopted from various sources including MEW of Afghanistan.

Reforms in Central Asia

- The current geopolitical climate in Central Asia is becoming more supportive of regional cooperation on issues of transboundary water resources management
- IWRM is the main approach to undertake reform in CA countries
- WEF nexus concept also driving reform at national levels
- Updating the legislation frameworks and strengthening institutions
- Organization of River Basin Management planning at Regional and National levels
- Introduction of water-energy saving technologies are carried out.
- Subsidy program for water-energy saving technologies
- Emerging support for transboundary cooperation

International Water Management Institute

Спасибо
Thank you

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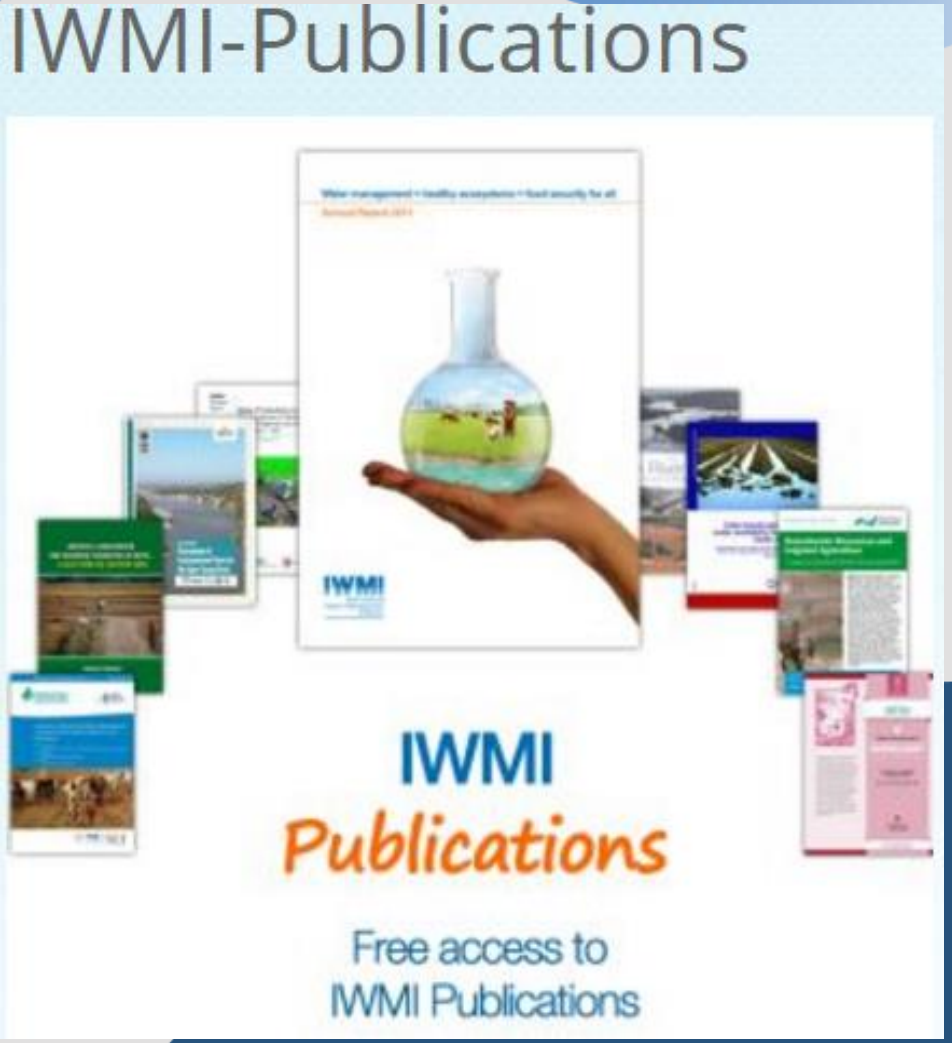
Innovative water solutions for sustainable development

Food·Climate·Growth



http://www.iwmi.cgiar.org/resources/apps/

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Food Systems in South-East Asia background and Thailand: Climate Change and DRR

Pongtip Thiengburanathum

ppuvacharoen@gmail.com

Food System and Climate Change Impact in Thailand and Southeast Asia

Pongtip Thiengburanathum,

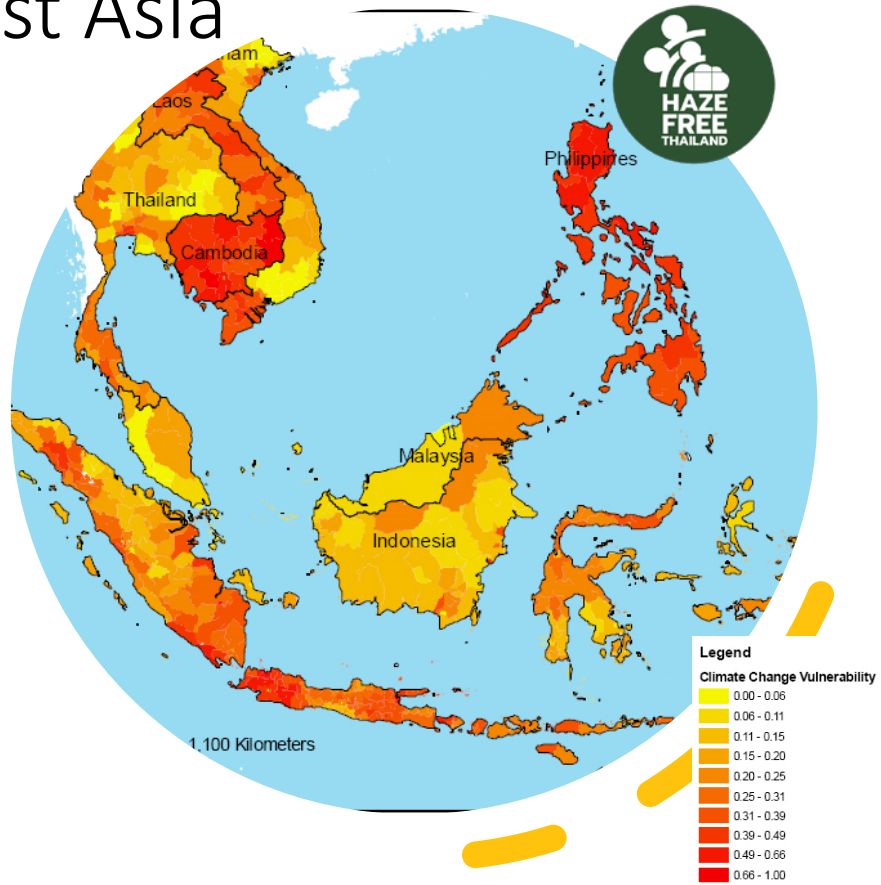
Researcher, Chiang Mai University, Co-Founder of Haze Free Social Enterprise

SDC Food System Learning Journey

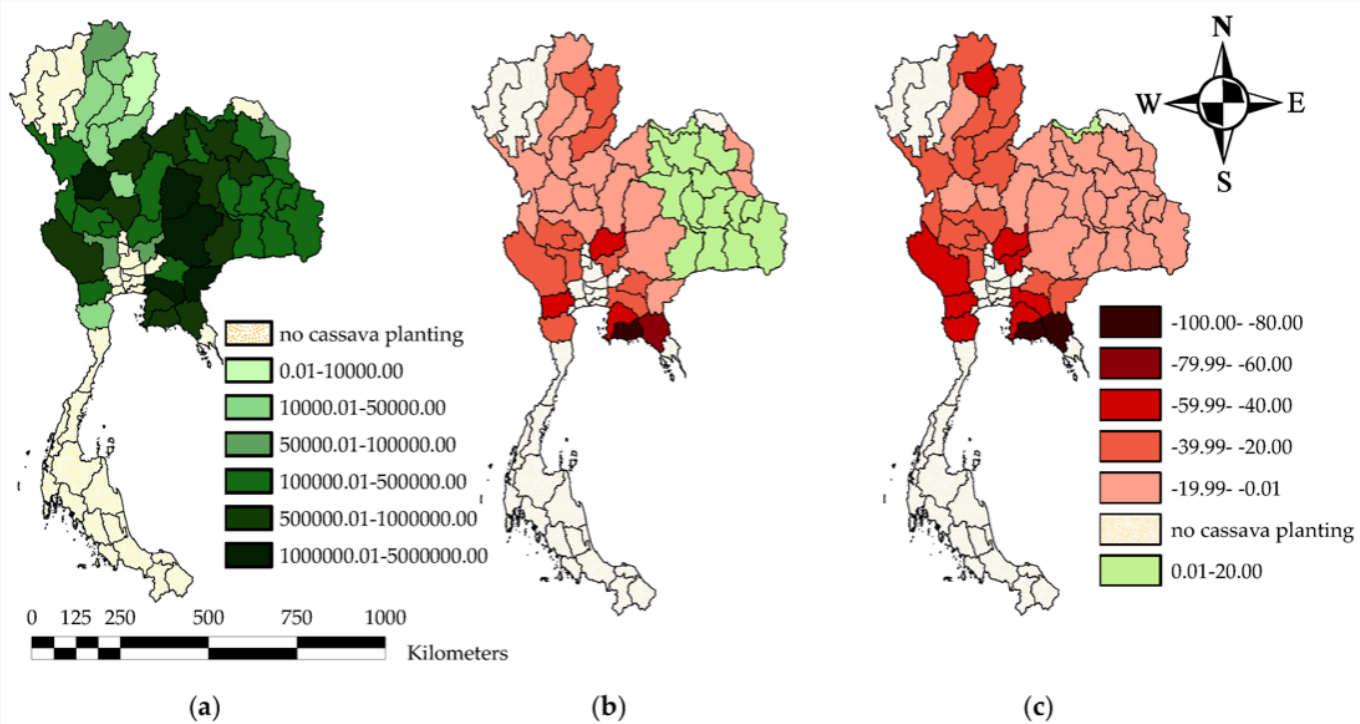
5 April 2023

Food System in Southeast Asia

- Southeast Asia is an important region for agriculture and food production globally. The region is home to the world's two largest rice exporters (Thailand and Viet Nam) (OECD/ FAO, 2017).
- Agricultural production and supporting sectors such as logistics, processing, and retail form the backbone of many Southeast Asian economies. A high proportion of the rural population, and an even higher proportion of the rural poor, still depend on agriculture for an important part of their livelihoods.
- The region has sustained strong economic growth in recent decades, many of the region's 600 million people still struggle with food and nutrition insecurity (FAO, 2021).
- As food systems transition with urbanization and rising incomes, changing food demand patterns are leading to increasing numbers of obese and overweight individuals in several countries (WHO, 2021).
- Food systems in Southeast Asia are highly vulnerable to climate change while being a significant contributor to climate change. Food systems account for a third of the greenhouse gases driving global anthropogenic climate change (Tubiello et al 2021).
- The challenge for this region is to have twin goals of enabling Southeast Asia's food systems to adapt to the threat of climate change while rapidly shrinking the carbon footprint of Asian food systems, and achieving nutritional objectives and poverty reduction, which requires policy innovation, local capacity, and updated investment strategies based on climate aware evidence.



Projected % changes in cassava production under climate change scenarios

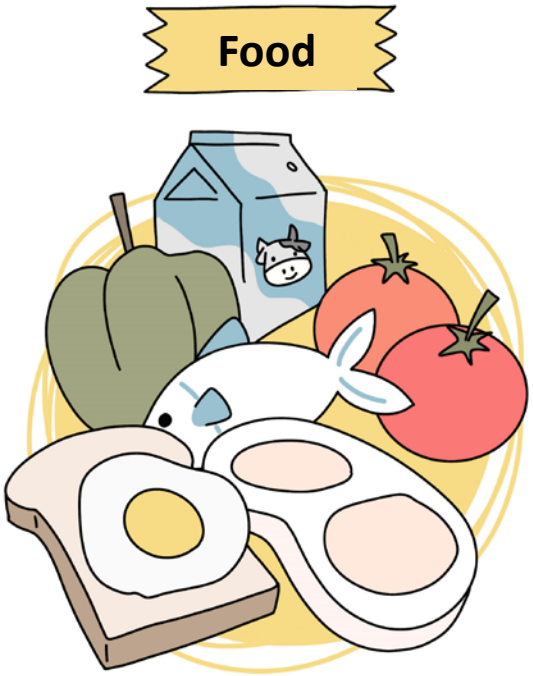


- production in the Northeastern region is forecasted to increase by 0.55–6.74%
- other regions are projected to decline to range from 0.14% to 94.27% under RCP 8.5.
- The top five cassava producers, accounting for 43.05% of total cassava production, are projected to experience a reduction of 1.44–39.29% under RCP 4.5 and 8.73–43.72% under RCP 8.5 from the baseline.

Source: Pipitpukdee S, Attavanich W, Bejranonda S. Impact of Climate Change on Land Use, Yield and Production of Cassava in Thailand. *Agriculture*. 2020; 10(9):402. https://doi.org/10.3390/agriculture10090402

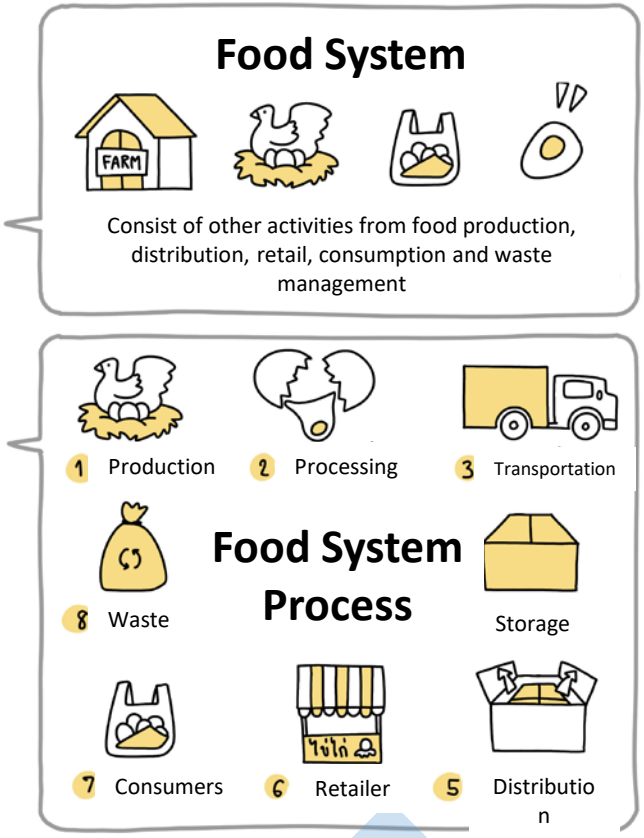
Thai Food System Analysis

Most people knows food but not “food system”.
To Understand Food System we need to take a food system journey!



Food provide nutrition for your body

refocus-foodsystem.com/REFOCUS/
design by Pictures Talk



HAZE FREE THAILAND

refocus-foodsystem.com/REFOCUS/
design by Pictures Talk

Factors influencing Thai Food System

Open Burn Fire

Agricultural Chemical

Animal Feed and Animal Industry

Climate Change

War

Contract Farming

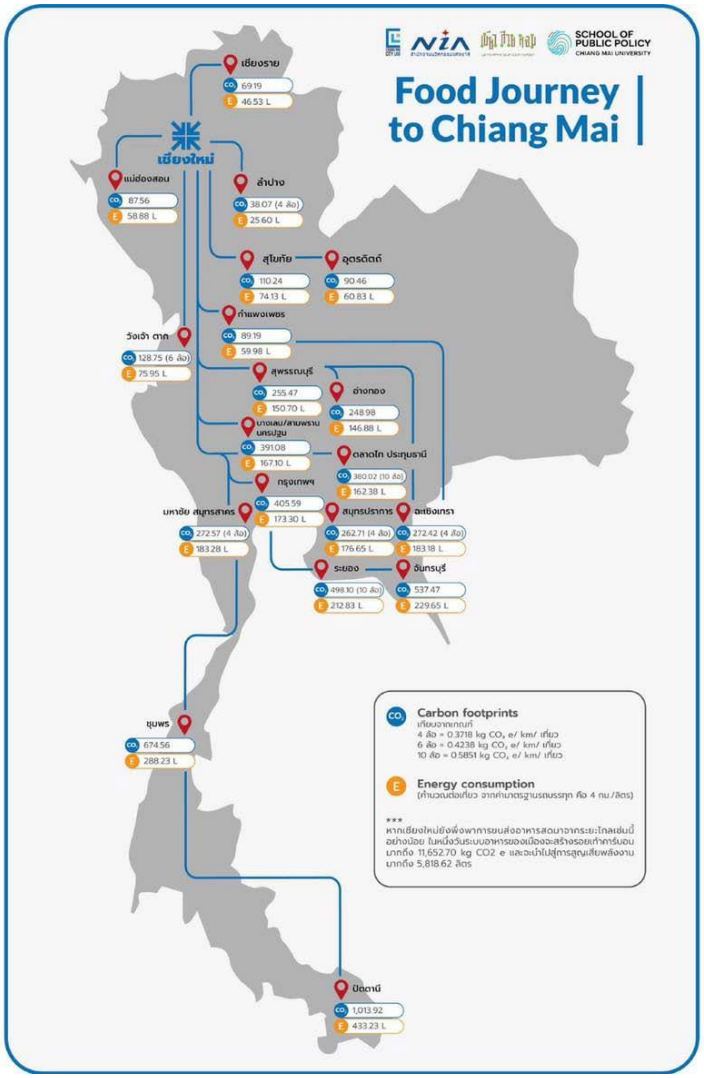
Seeds under Contract Farming

Covid-19

Swine Diseases

Higher Oil Prices

HAZE FREE THAILAND



Food System in Chiang Mai

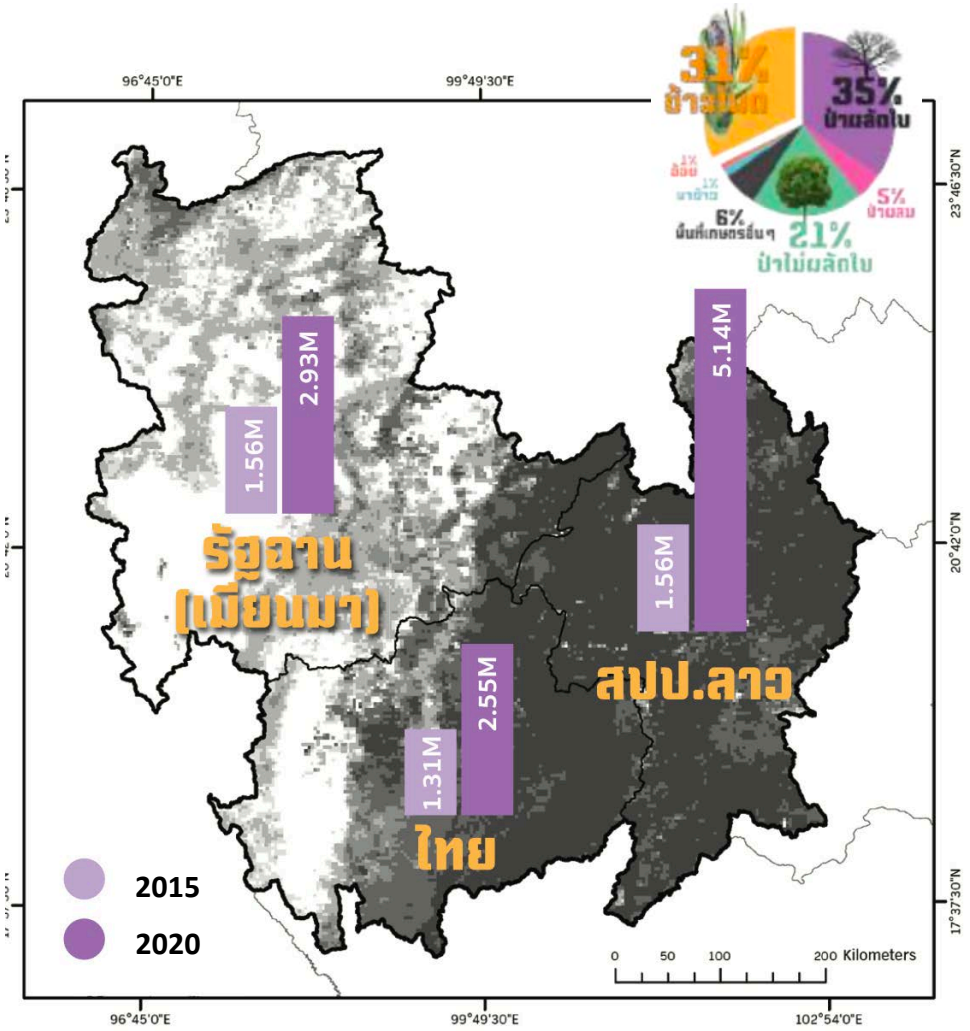
- Chiang Mai relies on food from other parts of the country.
- 8.5% of food is produced under organic process, and 10.2% from pesticide save. Most food (81.3%) apply pesticides and herbicides.
- Food Travel 23,274 km/day.
- Emitting 11 tCO_2e/day = 777 trees
- Food imported from abroad (USA, Australia and China) such as apples, grapes, oranges, carrots, ginger, beef etc.

HAZE FREE THAILAND

Source: Chiang Mai Food Journey 2021, School of Public Policy, Chiang Mai University

Example of Climate Change impact on Food System and DRR in Southeast Asia: a case of Haze


Deforestation
Problems
CO_2
cash crop/
Argricultural Burning
& chemical Methods
Farmers
Burning
Silo
High Land Areas
middle man
HAZE
problems
maize
maize
Silo
water contamination
elders
kids
Community /
Urban Areas
Health Problems
Economic Imports/
Tourist Industry
Livestock Food Production
Live stock Industry
Feeds
Export & other Industries
import



Source: Green Peace Thailand

Table 1. Key Feed Millers in Myanmar

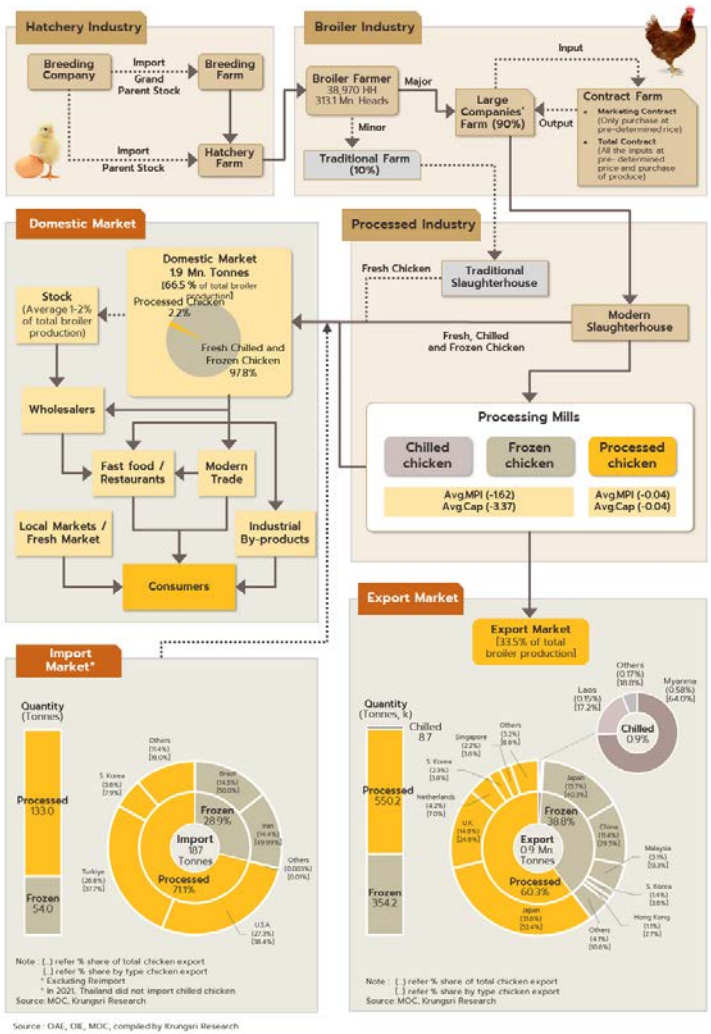
Feed Mill	Investment	Production Volume (MT/Month)	Locations
C.P.	FDI	23,000-25,000	Yangon, Mandalay, Taunggyi, Kyauk Me
Japfa Comfeed	FDI	15,000-18,000	Yangon, Mandalay
New Hope	FDI	4,000-4,2000	Yangon
Sunjin	FDI	2,500-3,000	Bago
De Heus	FDI	2,000-2,500	Yangon, Mandalay
Khuang Htet	Local	3,000-3,500	Yangon
KT	Local	3,500-4,000	Shwe Bo
Top	Local	1,000-1,500	Yangon
Crystal Diamond	Local	4,000-4,200	Yangon, Mandalay
Htoo Thit	Local	10,000-12,000	Yangon

Source: Myanmar Livestock Federation

- One-third of hot spots fell on maize plantation areas in 2020
- Importation tax of the main ingredients for animal feed has 0% tax imposed between 2021-2023
- Plantations between 2015-2020 increased 1.3 fold from 4.63 mn sq. km to 6.19 m sq. km. between 2015 -m 2020
- The majority of food mills in Myanmar is FDI

HAZE FREE THAILAND

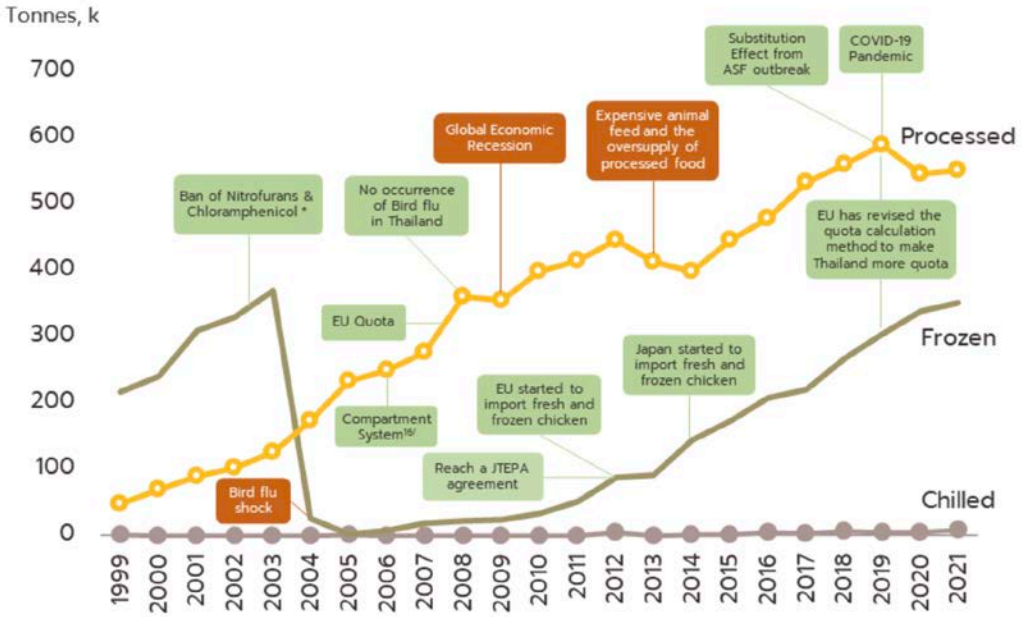
Figure 9: The Supply Chain of Thai Chicken Industry (2021)



Source : OAE, OIE, MOC, compiled by Krungsri Research

In 2021 , 33.5% of total chickens produced in Thailand was exported to Japan, UK and China

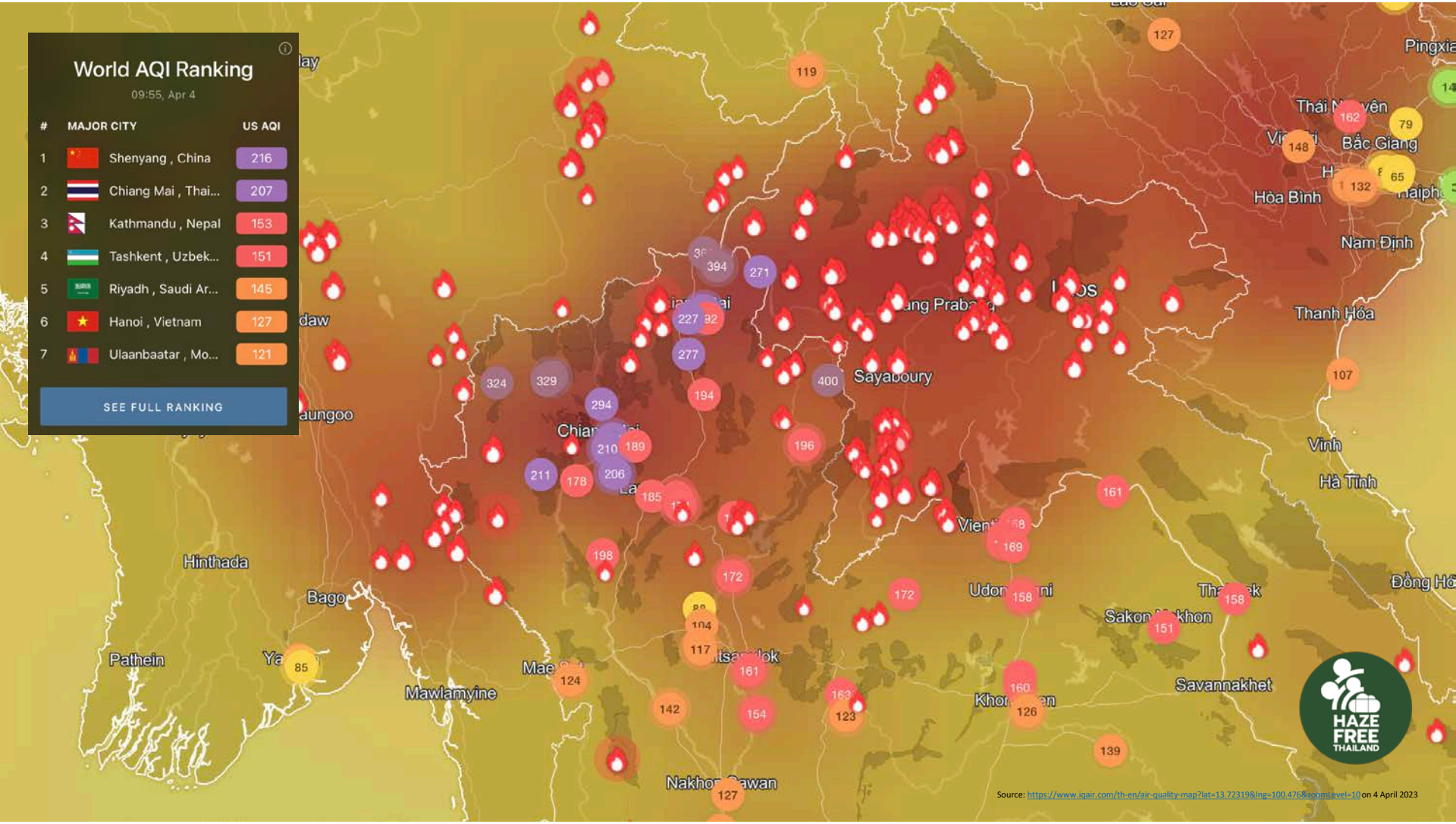
Figure 8: Thai Chicken Exports Volume



Note : * Nitrofurans In the past, the nitrofurans class of chemicals were used to prevent and to cure bacterial and protozoan infections in livestock, but these are now banned because they can cause cancers and genetic mutations.

Source: MOC, Krungsri Research


HAZE
FREE
THAILAND



Source: https://www.iqair.com/th-en/air-quality-map?lat=13.72319&lng=100.476&zoomLevel=10 on 4 April 2023

Chiang Mai was declared a disaster zone due to forest fire

ฉบับที่ ๑๔๔/๒๕๖๖

ประกาศจังหวัดเชียงใหม่
เรื่อง เขตพื้นที่ประสบสาธารณภัย/เขตการให้ความช่วยเหลือผู้ประสบภัยพิบัติกรณีฉุกเฉิน
อัคคีภัย ไฟป่า ในพื้นที่อำเภอฮางดง

ด้วยได้เกิดเหตุอัคคีภัย ไฟป่า ขึ้นในเขตพื้นที่อำเภอฮางดง เมื่อวันที่ ๓๑ มีนาคม ๒๕๖๖ ซึ่งภัยดังกล่าวเป็นสาธารณภัย/ภัยพิบัติกรณีฉุกเฉินก่อให้เกิดความเสียหายต่อชีวิต ร่างกาย หรือทรัพย์สินของประชาชน หรือก่อให้เกิดวัตถุมลพิษหมอกควันที่ส่งผลกระทบต่อสุขภาพอนามัย และการดำรงชีวิตของประชาชน

เพื่อประโยชน์ในการจัดการสาธารณภัยให้เป็นไปตามแผนการป้องกันและบรรเทาสาธารณภัยแห่งชาติ และการให้ความช่วยเหลือผู้ประสบภัยพิบัติกรณีฉุกเฉิน เร่งด่วน อาศัยอำนาจตามความ ข้อ ๒๐ วรรคสาม ของระเบียบกระทรวงการคลัง ว่าด้วยเงินทดรองราชการเพื่อช่วยเหลือผู้ประสบภัยพิบัติกรณีฉุกเฉิน พ.ศ. ๒๕๖๐ ประกอบกับแผนการป้องกันและบรรเทาสาธารณภัยแห่งชาติ ผู้ว่าราชการจังหวัดผู้อำนวยการจังหวัดจึงประกาศให้พื้นที่ดังต่อไปนี้

- หมู่ที่ ๗ ตำบลบ้านปง

เป็นเขตพื้นที่ประสบสาธารณภัย/เขตการให้ความช่วยเหลือผู้ประสบภัยพิบัติกรณีฉุกเฉิน เพื่อให้ส่วนราชการ หน่วยงาน องค์กรปกครองส่วนท้องถิ่น และภาคเอกชนที่เกี่ยวข้อง เข้าดำเนินการตามอำนาจหน้าที่ในเขตพื้นที่ประสบภัยดังกล่าว ตามพระราชบัญญัติป้องกันและบรรเทาสาธารณภัย พ.ศ. ๒๕๕๐ แผนการป้องกันและบรรเทาสาธารณภัยแห่งชาติ แผนการป้องกันและบรรเทาสาธารณภัยจังหวัด และแผนอื่นที่เกี่ยวข้อง ตลอดจนกฎหมาย ระเบียบ คำสั่ง ประกาศ และมติคณะรัฐมนตรีที่เกี่ยวข้องโดยเร็ว และดำเนินการช่วยเหลือผู้ประสบภัยพิบัติตามหลักเกณฑ์และวิธีการที่กระทรวงการคลังกำหนด ทั้งนี้ ต้องไม่เกิน ๓ เดือน นับแต่วันที่เกิดภัย

ประกาศ ณ วันที่ ๓๑ มีนาคม พ.ศ. ๒๕๖๖

(นายชัชวาลย์ ปัญญา)
รองผู้ว่าราชการจังหวัด ปฏิบัติราชการแทน
ผู้ว่าราชการจังหวัดเชียงใหม่
ผู้อำนวยการจังหวัด

Source: https://www.thaipbs.or.th/news/content/326203

SDC A+FS Network

Food Systems Learning Journey

A learning adventure taking us around the globe to understand and act more systemically

The DRR equation

Mila Lomarda

mila.lomarda@eda.admin.ch

The Disaster Risk Equation : The Components of Risk

Disaster Risk = $\dfrac{\textbf{Hazard} \times \textbf{Exposure} \times \textbf{Vulnerability}}{\textbf{Capacity}}$

Hazard: Likelihood of loss of life, injury or destruction and damage from a disaster in a given period of time

Exposure: A process, phenomenon or human activity that may cause loss of life, injury, socio-economic disruption or environmental degradation

Vulnerability: The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas.

Capacity: The characteristics which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

Strengths, attributes and resources available within a community, organization or society to manage and reduce disaster risks and strengthen resilience.

Source: Global Network of Civil Society Organisations for Disaster Reduction

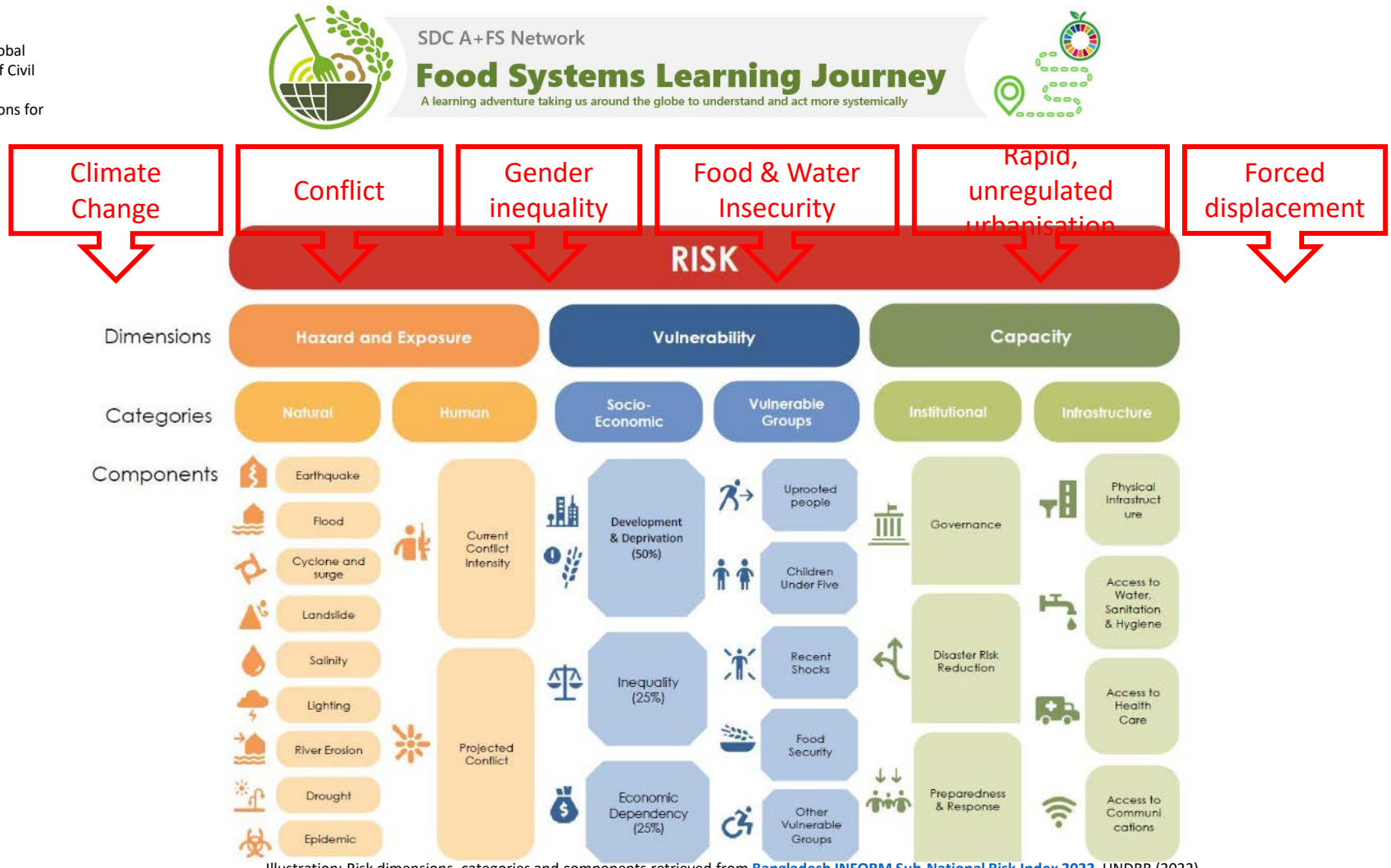


Illustration: Risk dimensions, categories and components retrieved from Bangladesh INFORM Sub-National Risk Index 2022, UNDRR (2022)

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Application of the Food Systems Approach to DRR

Dr John Ingram

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The Food System approach

Recognises different Food System 'Activities'

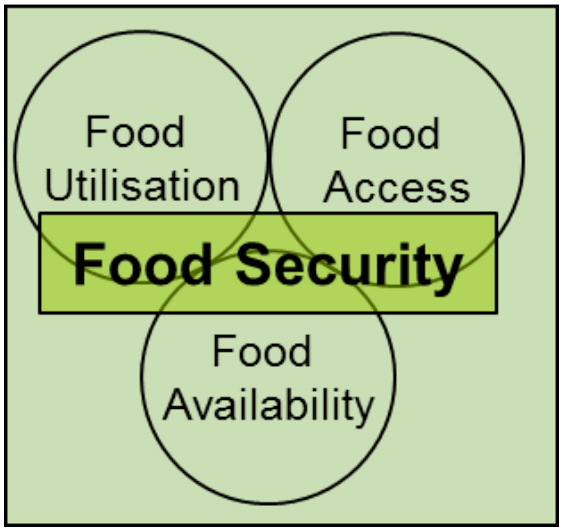
The Food System approach
Recognises a range of 'Outcomes'

'Activities' and 'Outcomes':
Balancing the 'What We Want'
with the 'What We Do' and the 'What We Get'

Trade-offs!

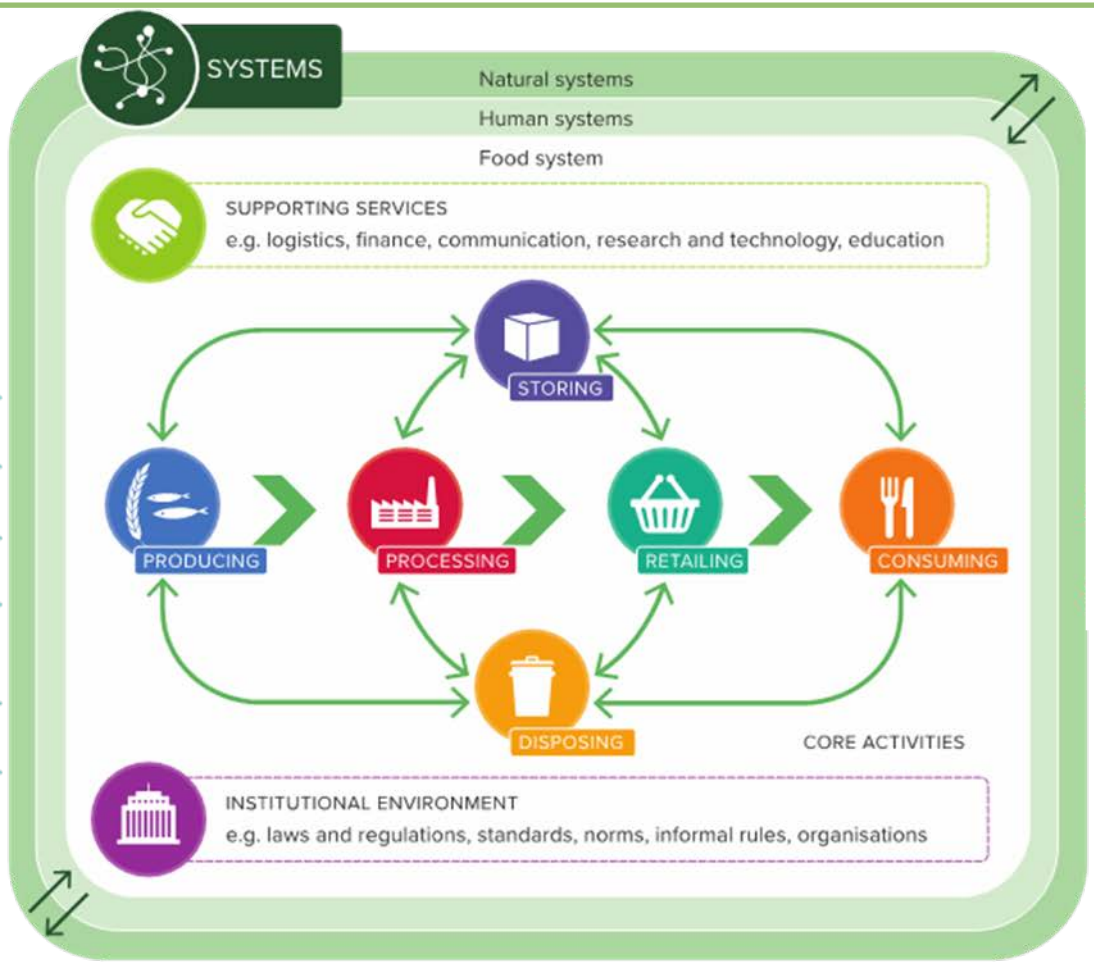
Synergies!

Socioeconomic Outcomes
- Income
- Employment
- Profit
- Social capital
- Political capital
- Human capital
- …

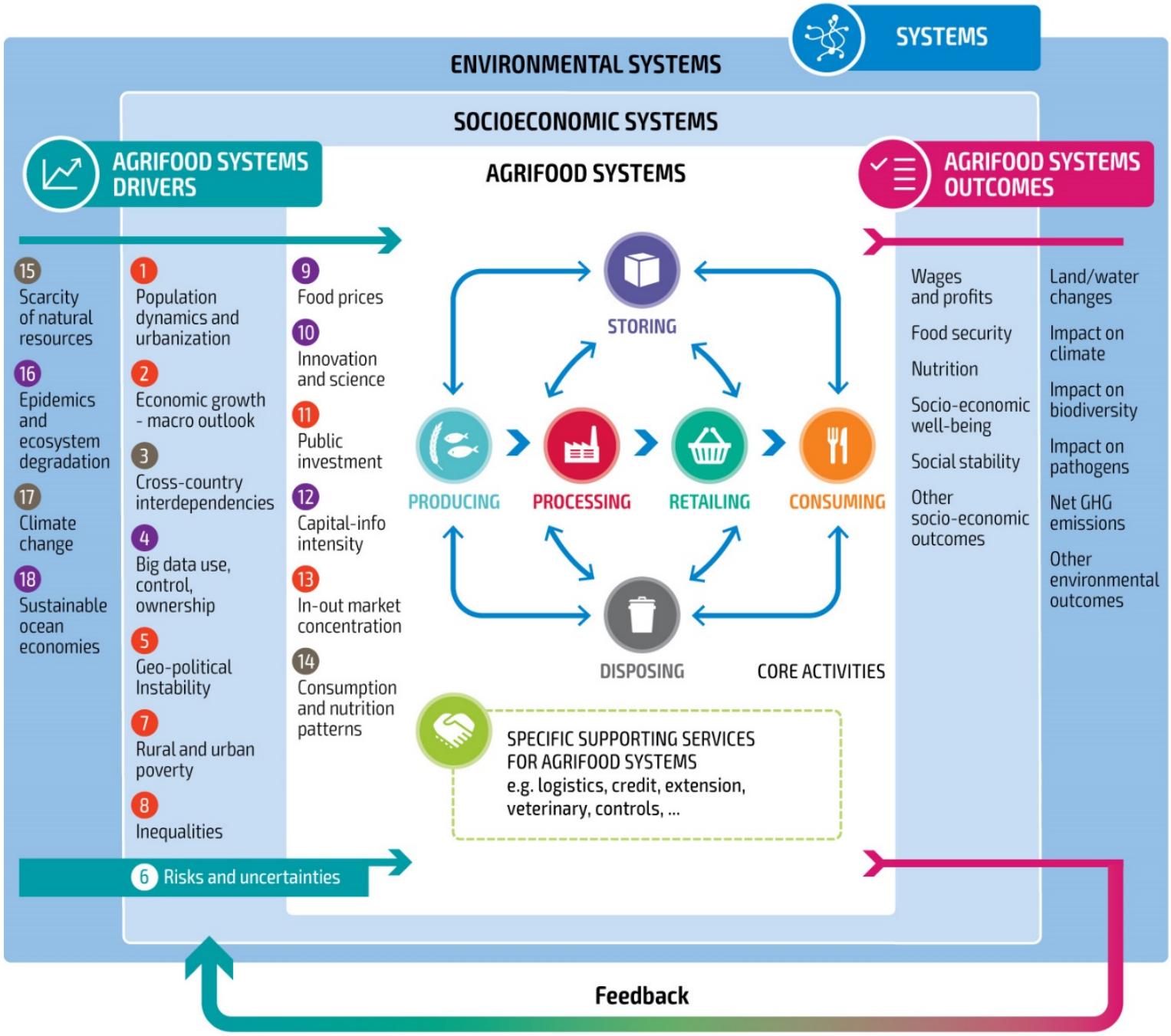


Environmental Outcomes
- Climate change
- Water availability
- Water quality
- Biodiversity
- Biogeochemistry
- Soil degradation
- …

SDC's FSLJ uses a Food System conceptual framework developed by the Foresight4Food Programme



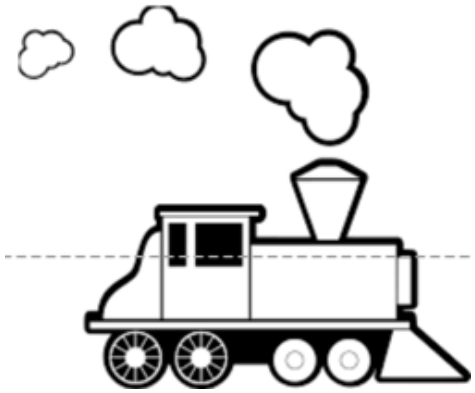
Foresight4Food
International Collaborative Initiative



Source: FAO. 2022. *The future of food and agriculture – Drivers and triggers for transformation*. Rome.

Food System Stresses and Shocks
Relevance to DRR

Stresses
"Stream Trains"



Easily perceived drivers and trends that will influence change - direct and indirect

Shocks
"Black Swans"

Unimagined, rare and/or unpredictable events that have a big impact

Food System Stresses and Shocks

Stress ***pressure or tension exerted on a system [Steam Trains]***	**Shock** ***sudden surprising event affecting a system [Black Swans]***
Demography	
Social & cultural norms	
Natural resource degradation	
Climate change	
Urbanisation	
Automation	
Science and Technology	
Geopolitics & Conflict	

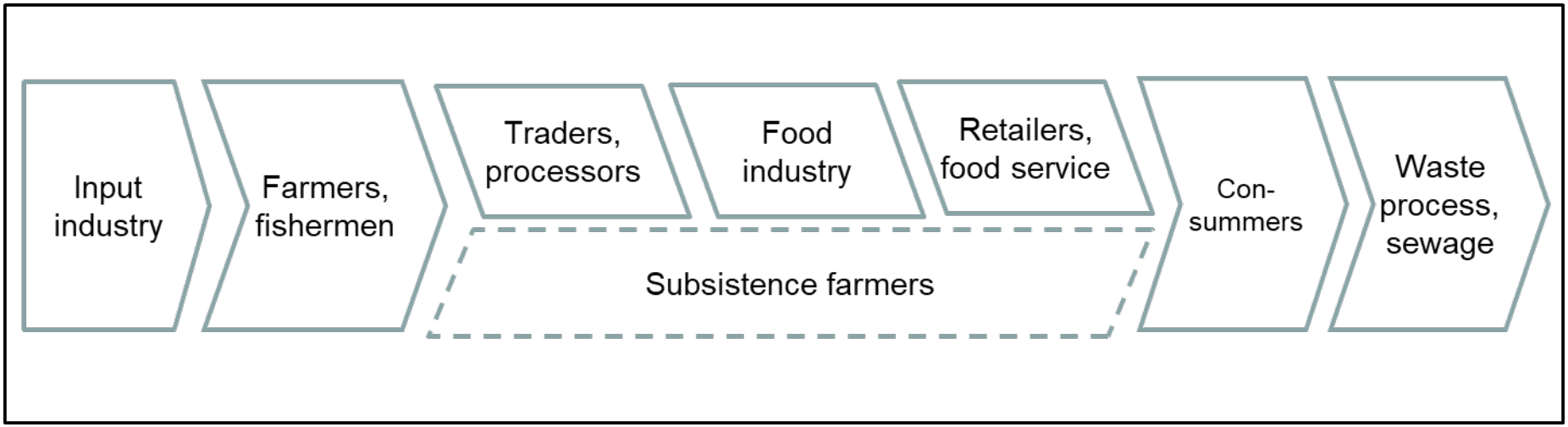
Food System Stresses and Shocks

Risk of stresses/shocks interactions

Stress ***pressure or tension exerted on a system*** ***[Steam Trains]***	**Shock** ***sudden surprising event affecting a system*** ***[Black (Grey?) Swans]***
Demography	Trade wars
Social & cultural norms	Geophysical events
Natural resource degradation	Food scares
Climate change	Extreme weather
Urbanisation	Election and Referenda results
Automation	Pandemics
Science and Technology	
Geopolitics & Conflict	

Risk from who's perspective?

Food system 'actors'



And/Or from others' perspectives?

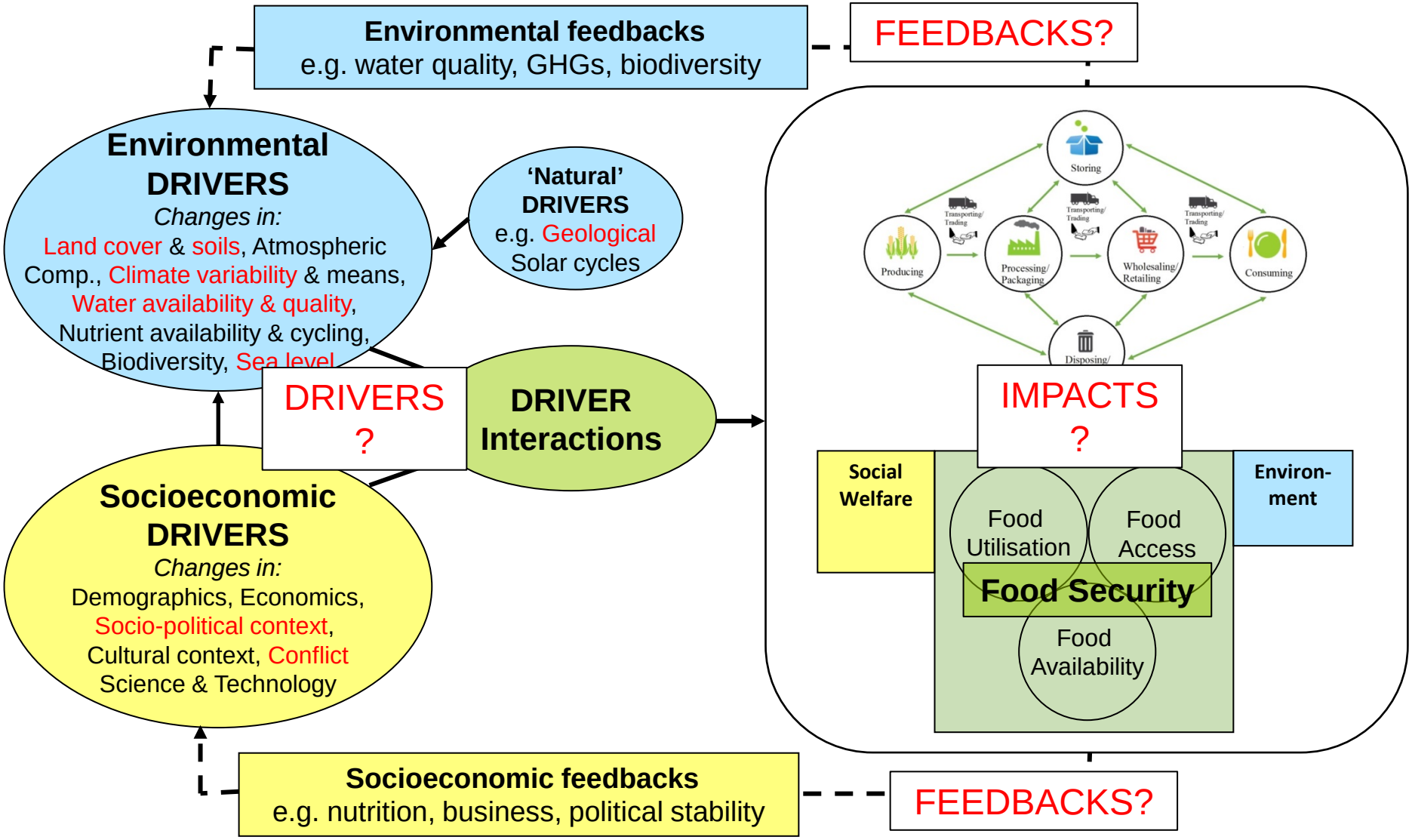
Policy, private interests, 3rd Sector, society, …

Risk over what time period?

- **Short-term *interruptions* (usually due to shocks)** to e.g.:
  - Fishing or agricultural activities (due to e.g. extreme weather)
  - Critical ingredient shortfall (due to e.g. disease outbreak)
  - Just in time groceries delivery (due to e.g. IT malfunction)
  - Consumer shopping patterns (due to e.g. food scares)
- **Longer-term *disruptions* (usually due to stresses)** to e.g.:
  - Natural resource degradation
  - Energy price
  - Low-carbon emission regulations
  - Change in dietary preferences

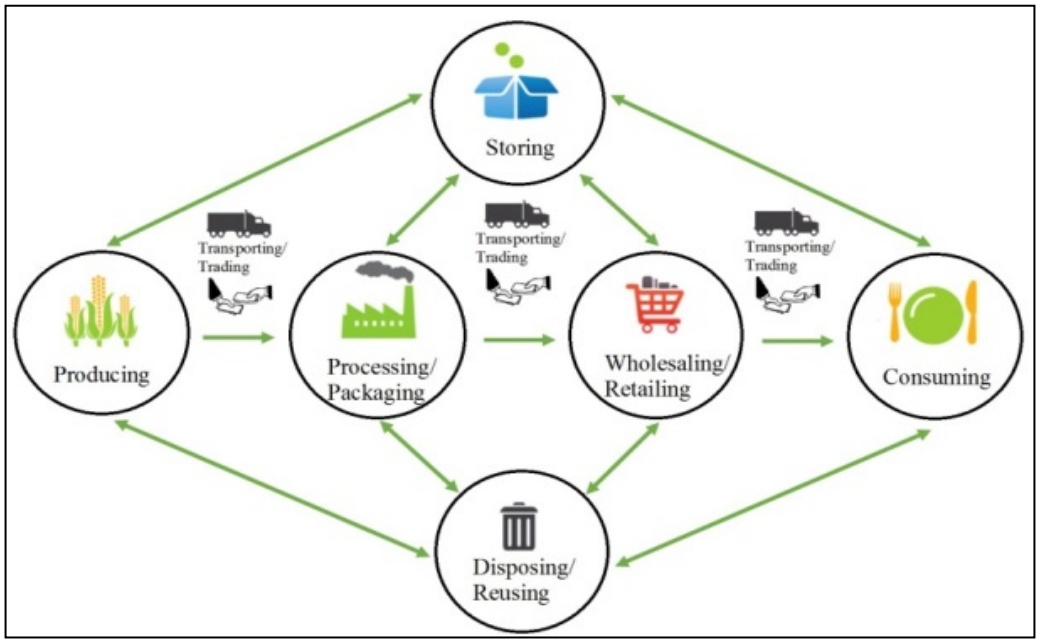
Disaster Risk Reduction

*concept and practice of reducing disaster risks through systematic efforts to analyse and reduce the **causal factors** of disasters.*



Risk to what?

Food System Activities



OR

Food System Outcomes

Food System OUTCOMES

Social Welfare
- Health
- Employment
- Health
- Social capital
- Political capital
- Ethics
- …

Food Security
- Food Utilisation
- Food Access
- Food Availability

Environment
- Climate change
- Water availability
- Water quality
- Biodiversity
- Biogeochemistry
- Soil degradation
- …

Needs a Food System approach to reduce risk to Food System Outcomes

Reassess

Adapt

Project Design and Food System Policies

Social, Economic, Political, Science & Technology and Biophysical Drivers

Signals Opportunities or Threats

Food System **Activities**

Reduce risk

Food System **Outcomes**

Socioeconomic Outcomes

Food Security Outcomes

Environmental Outcomes

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A learning adventure taking us around the globe to understand and act more systemically

Methods and Learnings from Central Asia & South/South-East Asia FSLJ workshops

Dr John Ingram

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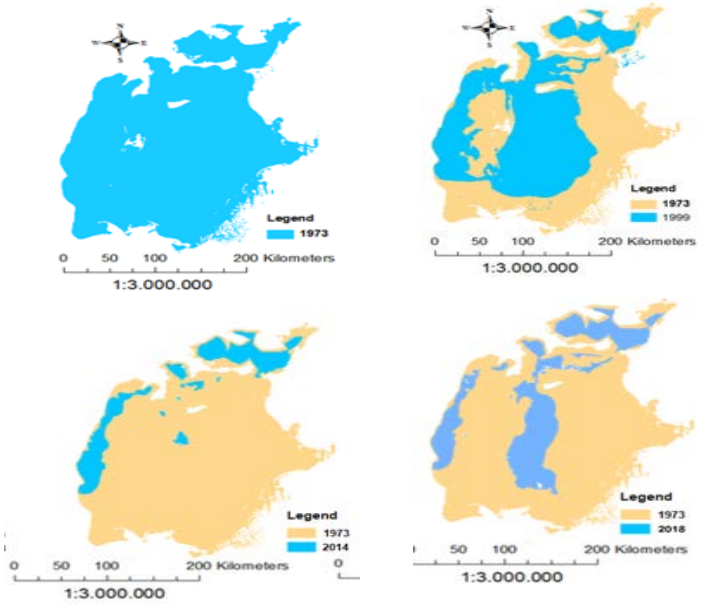
Central Asia: Regional challenges

- Growing populations
- Land degradation: salinization and waterlogging
- Climate change – frequency of drought years and flood years increased
- Outdated irrigation and drainage infrastructure – water losses
- Poor water use efficiencies
- Water quality
- Water governance
- Water-energy-food interdependencies
- Data availability and data quality
- Transboundary cooperation

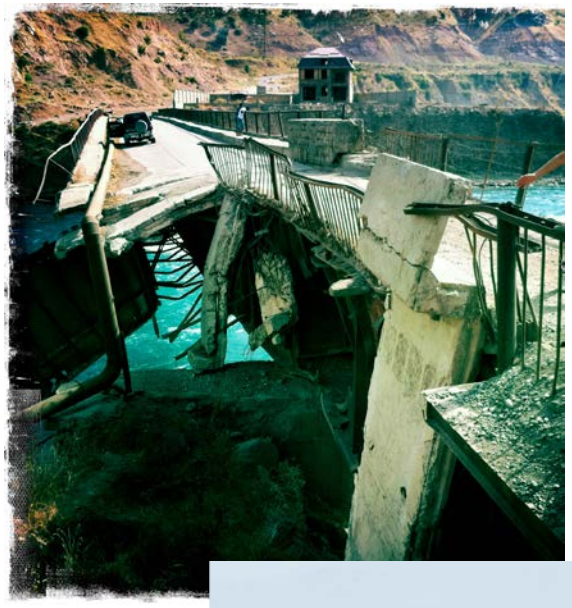


Countries in Central Asia

Country	Population (2020)
Uzbekistan	33,469,203
Kazakhstan	18,776,707
Tajikistan	9,537,645
Kyrgyzstan	6,524,195
Turkmenistan	6,031,200

Central Asia: Core Challenges for irrigation

- **Difficult Cost Recovery**
  - Operation and maintenance of vast infrastructure is challenging
- **Absent Modernization**
  - Analog, ineffective workflows
- **Data**
  - Lack of consistent data records
  - Outdated data (land melioration conditions , etc.)
  - Open-source data not valorized
- **Capacities**
  - Loss of experts & knowledge



Central Asia: Overall Conclusions

- Central Asia is a highly diverse and complex region with clear differences between ‘upstream’ and ‘downstream’ countries.
- Water-related challenges are highly significant on all accounts and for which there are no easy solutions.
- The modernization of the irrigation sector is hampered by the lack of adequate recovery of costs.
- New cost-effective monitoring enables improved irrigation water service delivery.

Example Workshop Challenges and Tools

SE Asia:

- How to improve livelihood of fish farmers in Tonle Sap Lake, Cambodia?
- How to ensure year-round market access to rural communities.
- How to incentivize production and consumption of organic food in Southeast Asia?
- How to enhance nutrition to areas prone to soil degradation.

➢ Rich Pictures
➢ Trade-off analysis
➢ Stakeholder Mapping
➢ Backcasting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By when
Pre-condition
Policy
Practice
2030
2027
2025

South/South East Asia: Overall Conclusions

- Projects very varied but mainly addressing agricultural issues
- Food Systems approach and tools valuable in integrating climate, water and nutrition issues with DRR
- Silo government is one of the largest challenges faced when implementing policy or working on project with multiple agencies.
- Wicked problems such as food security consists of many interacting food system components, so analysing the system, and identifying key stakeholders requires agreeing clear “boundaries”.

Summary of key points from both workshops

Food Systems, Climate Change and DRR

- Context matters: drivers, geography, history, …
- Climate change is an underlaying stress on the food system compounded by hazards causing shocks.
- There is a clear linkage between the food system, climate change and DRR.
- “Risk” is a potential negative impact on the food system and is a function of hazard, vulnerability, exposure, and coping capabilities.
- Siloed government is one of the largest challenges faced when implementing policy or working on project with multiple agencies.

Summary of key points (2)

Food Systems, Climate Change and DRR

- Boundary setting for a project is important: too large will lead to too many stakeholders to manage, too small will have minimal impact.
- It is also important to note the boundary of governmental responsibility.
- Identifying “critical” actors within the system and building relationship as strategic partners will maximise the project’s chance of success.
- It is important in the transformation work to consider trade-offs and aim for synergies. It is not possible to provide maximum benefits to all stakeholders, so expectations must be managed.
- Potential positive and negative feedbacks to people and entities from project interventions need to be assessed with stakeholders.

Summary of key points (3)

More general issues

- Social and ethical concepts of equity, inclusiveness and land access have a strong bearing on food systems governance and hence on the resilience of the food system outcomes.

- Defining appropriate systems boundaries for a project is important including those of partners as these are often set for them on the basis of their jurisdiction, available expertise and defined responsibilities.

- The discussion of systems boundaries can be linked to an analysis of risks and project impacts. The system boundary should be chosen wide enough to consider all critical risks, and measures must be taken to cover them, either by the project itself, or by other projects and partners. Systems analysis can assist a CEDRIG exercise.

Comparing Regional Food Systems
Spatial, temporal and jurisdictional levels

Drivers: trends and status

Actors: practitioners and influencers

Activities: nature and intensity

Outcomes: food security
other socioeconomic parameters
environmental

Governance: history (esp. in C Asia), current, land tenure, …

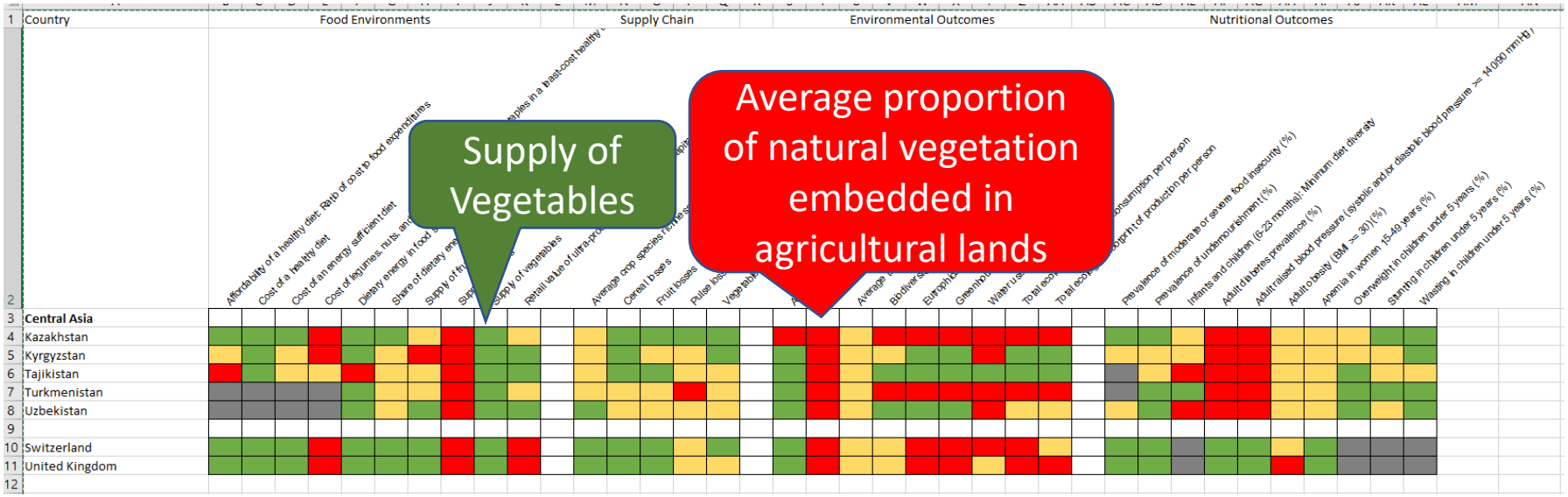
Farming System: grazing, arable, irrigated, cash/subsistence, …

Diets: e.g., main carbohydrate, variety, … (Dashboard)

A Risk Analysis of ‘what we want’

https://www.foodsystemsdashboard.org/

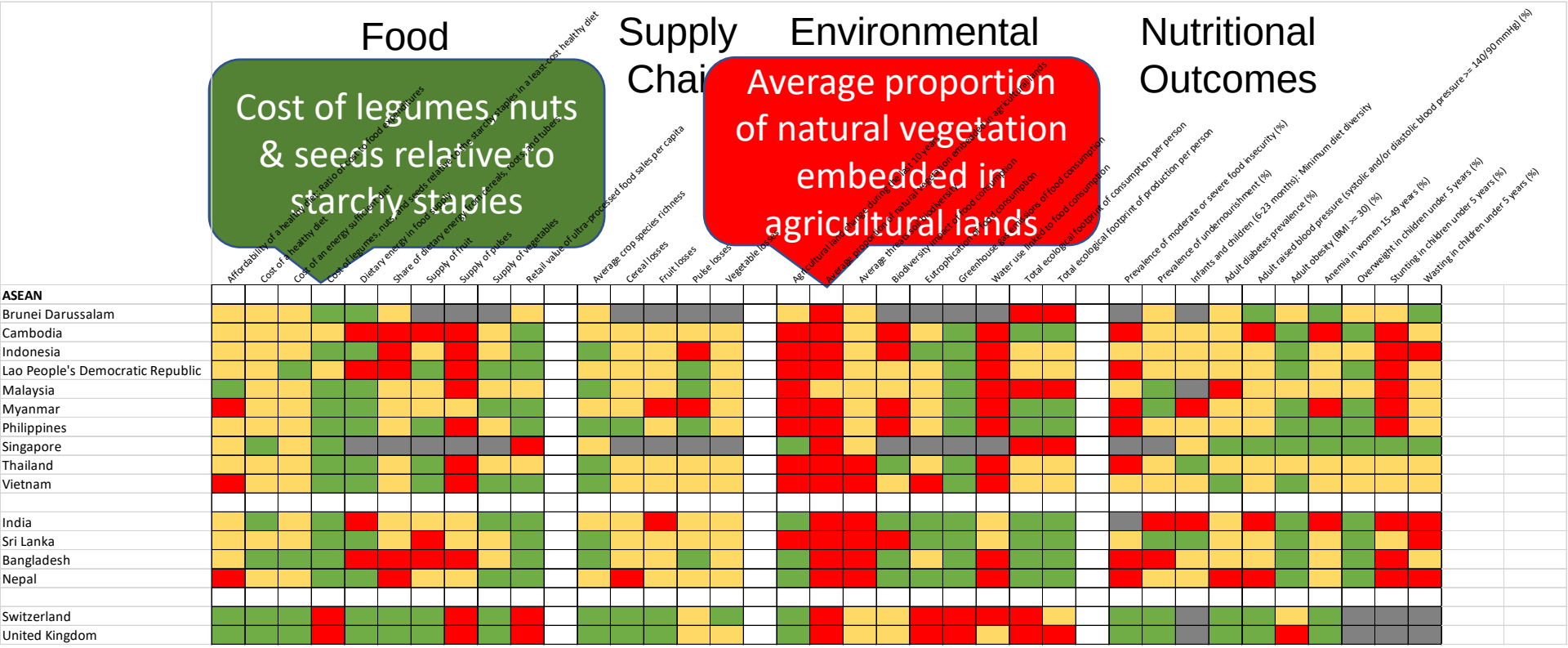
Food Environments | Supply Chain | Environmental Outcomes | Nutritional Outcomes



Unlikely to be a challenge	1	Green
Potential to be a challenge	2	Yellow
Likely to be a challenge	3	Red
Missing	0	Grey

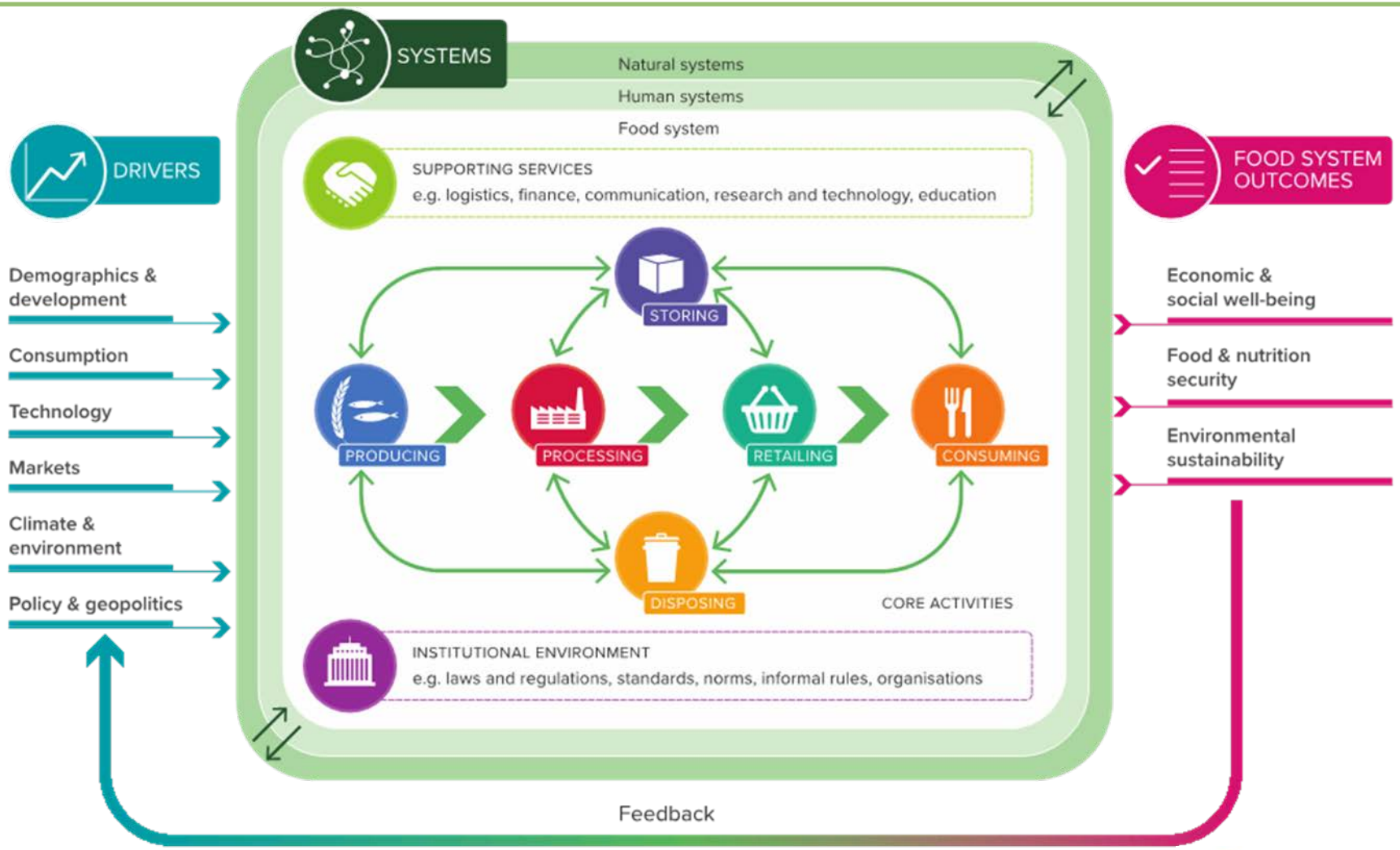
A Risk Analysis of ‘what we want’

https://www.foodsystemsdashboard.org/



Unlikely to be a challenge	1	Green
Potential to be a challenge	2	Yellow
Likely to be a challenge	3	Red
Missing	0	Grey

SDC's FSLJ uses a Food System conceptual framework developed by the Foresight4Food Programme



Foresight4Food
International Collaborative Initiative

Describing Regional Food Systems
in relation to DRR

Shocks: extreme weather, landslides, …

Stresses: climate, demography, …

Hazard: natural, anthropogenic, …

Exposure: situation of e.g. transport infrastructure, logistics, …

Vulnerability: conditions which increase the susceptibility, ...

Capacity: of the state, agencies, …

1.While reasonably well adapted to climate variability, agricultural production in South Asia must undergo further context-specific adaptation to remain resilient to prospective changes in climate patterns.

2.The answer to protecting agricultural land from rising sea levels is seek nature-based solutions to sea water incursion, e.g. through restoring mangrove belts and marshlands, and by employing agroecological approaches in affected areas.

3.Feeding a growing population will entail a transiting to less meat-based diets, addressing loss and waste and ensuring that food is more equitably distributed. This must be achieved without increasing the arable land surface.

4.Action must be based on knowledge from independent and trusted sources, that is propagated through training for food systems actors (consumers, farmers, distributors) must be inclusive and underpinned by dialogue and independent facilitation.

5.Not only in South-East Asia, but across the whole world must balanced and nutritious diets be advocated in which meat is consumed in moderation.

6.The South Asian diet should be based on a wide range of rice sorts and a variety of climate-appropriate cereals which are cultivated through crop rotation and other appropriate agriculture techniques.

7.There is a demand for an environmentally and socially sensitively produced food, and change must be incentivised by government programmes for local production coupled with conservation. Affordability and accessibility must be anchored as guiding considerations.

8.South and South-East Asia may have to intensify agriculture and apply more mechanised farming methods; but it must be balanced with conservation to protect biodiversity as a primary, non-negotiable concern.
We must include the concepts of sustainable water management systems in the regional concept of food systems, and one must be considered an integrated part of the other.

SDC A+FS Network

Food Systems Learning Journey

A learning adventure taking us around the globe to understand and act more systemically

Upcoming Regional Workshops

Latin America / Santa Cruz de la Sierra – 19th – 21st April (Sp)

Upcoming Webinars

→ ***Latin America online event: 4th May, 16 – 17:30 CET***

→ ***Food Systems – Resilience, Foresight and Scenarios: 11th May 2023 9:30 – 11:30 CET***

→ ***Final Summative Events: 14th & 15th June***