National Water Resources Management Project in Tajikistan

Feasibility Study

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Views and observations expressed in this document do not necessarily reflect the views of the Swiss Cooperation Office in Tajikistan and/or Swiss Agency for Development and Cooperation (SDC) or any other governmental and non-governmental organizations, but solely views and observations of the author.

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Abbreviations

ACTED	Agency for Technical Cooperation and Development
ADB	Asian Development Bank
AIWR	Agency for Integrated Water Resources
CHF	Swiss Frank
DCC	Development Cooperation Council
DFID	Department for International Development
DRR	Disaster Risk Reduction
EBRD	European Bank for Reconstruction and Development
EU	European Union
EWS	Early Warning System
GAO	Gross Agricultural Output
GAFTF	Global Agriculture and Food Security Trust Fund
GBAO	Gorno-Badakhshan Autonomous Oblast
GDP	Gross Domestic Product
GIZ	German International Cooperation
GoT	Government of Tajikistan
GRP	Gross Regional Product
HPP	Hydro Power Plant
IAC	Irrigation-Agriculture Consulting
IAEA	International Agency for Atomic Energy
IFRS	International Financial Reporting System
IP	Implementing Partner
ISW	International Secretariat for Water
IWIMS	Integrated Water Information and Management System
IWRM	Integrated Water Resources Management
KMK	Khojagii Manzilyu Kommunali (Housing and Communal Association)
MDG	Millennium Development Goals
MEI	Ministry of Energy and Industry
MLRWR	Ministry of Land Reclamation and Water Resources
MoA	Ministry of Agriculture
NDC	National Development Council
NDS	National Development Strategy
NGO	Non-Governmental Organisation
NPD	National Policy Dialogue
NWEC	National Water and Energy Council
O&M	Operation and Management
PRS	Poverty Reduction Strategy
SCO	Swiss Cooperation Office
SDC	Swiss Agency for Development and Cooperation
SECO	State Secretariat for Economic Affairs (Swiss)
SILS	Strategy for Improving Living Standard
SUE	State Unitary Enterprise
TA	Technical Assistance

UNDP	United Nations Development Programme
UNECE	United Nations Economic Cooperation for Europe
UNFAO	United Nations Food and Agriculture Organisation
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
VAT	Value Added Tax
WB	World Bank
WFP	World Food Programme
WIS	Water Information System
WTO	World Trade Organisation
WUA	Water User Association
YGPE	Youth Group for Protection of Environment

Acknowledgement

This mission was truly complex and intensive, considering that a whole range of subjects in a wide area needed to be covered to provide a full picture. Undertaking such an intensive mission always requires excellent support and back-up that is crucial for the mission to achieve its goals.

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The mission has been hard and difficult but also very rewarding and this has been clearly expressed during the two stakeholder roundtables in Khujand and Dushanbe, where most participants are keenly looking forward to the implementation of such a comprehensive programme, which would inevitably lay a solid foundation for a sustainable water sector in Tajikistan.

Executive Summary

In January 2013, SDC Management approved a project concept and agreed in principle to support Tajikistan's national water resources management programme until 2020 with CHF 13 million (US$ 14 million) of financing. The Project Concept envisages four major outcomes, including support to the implementation of water sector reform; support to enhance capacities and institutions of irrigation and drainage service providers and operators (MIROB, WUAs) along Syr Darya Basin to improve water productivity and irrigation technology; establishment and development of Syr Darya Basin Organisation; and support 1-2 select sub-basins of the Syr Darya across Tajikistan and Kyrgyzstan for transboundary collaboration and support to communities for watershed management and disaster risk reduction.

In March 2013, SDC contracted this mission to undertake a feasibility study along the Syr Darya Basin and validate initially proposed programme components through a comprehensive and participatory consultation with national, provincial and basin stakeholders.

The mission travelled around 2,000 km in and around the Northern Districts of the Sughd Oblast, the Syr Darya and visited the basin and its four sub-basins, Isfara, Isfana, Khoja Bakirgan and Aksu, covering some 1,000 km of primary and secondary as well as on-farm canals and infrastructure.

Demography and Geography: The Sughd Oblast (province) is divided into 11 northern and 3 southern districts, separated by the Turkistan Mountain Ranges, with a total area of 25,400 square km and a population of 2.35 million (2012) compared to 1.87 million according to the 2000 census. With Khujand as its capital, Sughd is located in the north of Tajikistan, bordering with Uzbekistan and Kyrgyzstan. Khujand is the second largest city in Tajikistan with a population of 168,000 (as of 2012).

Economy: Sughd economy is growing fast from 13% in 2009 to 13.5% in 2011. Agriculture, trade and industry contribute 28.2%, 25.8% and 14% respectively to Sughd's Gross Regional Production (GRP). Industrial production has grown two-fold since 2000, further stimulated by the creation of the "Sughd Free Economic Zone". In October 2012, Khujand hosted the first "International Economic Forum" attracting many national and international organisations, business structures and chambers of commerce and industry from a number of countries.

Agriculture: Total agriculture area is estimated at around 273,000 ha with 90% in northern districts - Syr Darya Basin. However, 265,000 ha are considered arable though only around 200,000 ha is under irrigation, while non-governmental organisations believe agriculture area under irrigation is 150,000-160,000 ha. Dominated by cotton, agriculture depends 70% on irrigation from pump stations, much of which is 40-50 years old and with little rehabilitation and maintenance the infrastructure has fallen into disrepair.

Syr Darya Basin: Syr Darya, with its four main sub-basins (Isfara, Isfana, Khoja Bakirgan and Aksu) and a few smaller tributaries, is the main source of water and energy for the northern districts. Originating from Naryn River and Kara Darya in Kyrgyzstan, the Syr Darya basin drains over an 800,000 square km but actually only 200,000 square km contribute significant flow to the river. Annual flow of Syr Darya is estimated at around 37 cubic km per year, half of its sister river, the Amu Darya.

Four water reservoirs with total capacity of around 4,530 million m^3 with an average annual use of 2,683 million m^3 facilitate access to water in Syr Darya Basin.

The irrigation system in the Tajik part of Syr Darya basin is served by around 1,400 km of primary and secondary canals with 935 hydraulic structures[1] and some 10,300 km of tertiary (on-farm) canals with 1,470 hydraulic structures. Additionally, 45 on-farm and 179 off-farm pump stations are delivering over 60% of the total irrigated agriculture area with water.

Irrigation Infrastructure: Despite some investment by development partners since 2003, an estimated 40-50% of the infrastructure (including pumping stations) requires urgent rehabilitation. The total costs of rehabilitation for the Tajik part of Syr Darya Basin is estimated at over US$ 80, while rehabilitation costs for Khoja Bakirgan and Aksu sub-basins alone is estimated at around US$ 26 million.

Current water losses from the source to the farm are estimated at 20-30%. However, an estimated 20-30% water loss occurs on the farm. Much of the drainage pumping stations has become dysfunctional causing severe water logging and salination (estimated 10% of the total arable area).

Water Institutions: The Oblast water organisations are subject to double sub-ordination: to the provincial and central authorities. The Oblast Directorate of the Water Resources (Oblvodkhoz) is mainly responsible for the overall regulation and management of the water resources, and the District Water Departments (Rayvodkhoz) are responsible for the actual day-to-day management and operation of the water resources.

Over the past 10 years, more than 100 Water User Associations (WUA) have been created, around 35 by international organisations and the rest by the water department. However, these organisations lack sufficient technical and managerial capacities as well as a solid economic base to be able to effectively respond to the growing needs of the users/farmers.

Water Delivery and Use Efficiency: Most primary and secondary infrastructure is solid and lined with concrete and thus the water loss is not that significant. Yet, due to lack of regular maintenance most require rehabilitation. Water loss at farm level, perhaps more than 50% of the total water loses, is due to the infrastructure, largely canals dug in mud and gravel terrain.

[1] Hydraulic structures include: gates, distributors, drops, regulators, inverted siphons, etc.)

Agriculture Pattern: Incomplete land reform, continued poor practices, especially in cotton growing areas and continued targets for cotton have resulted in huge debts. Water debt is growing by the day as well as farm debts to cotton futurists and investors, making it very difficult or impossible for small farms to improve productivity and production and therewith their livelihoods.

Watersheds and Disaster Risks: The province is prone to earthquakes of 6.5-8 at Richter Scale, strong winds and severe cold in winter and heat in summer periods. However, two major issues affect the water sector and therewith the agriculture sector, namely flash floods during rainy season and snow melting and severe mudflow. Similarly, due to lack of technical capacities and machinery, sediment management is a major problem in most rivers.

Intervention Priorities: As a result of extensive stakeholder consultation in the field and the two stakeholder workshops (Khujand and Dushanbe) following interventions have been concluded for future programmes, including:

- Support in piloting the **water sector reform**, based on principles of Integrated Water Resources Management (IWRM) and River Basin Approaches. This would entail separation of policy/regulatory and management/operation of the water sector.
- To achieve the goals of reform piloting, extensive and **systematic capacity building and institution development**, both for government institutions (basin authority, MIROB) and users (WUA).
- Support to **rehabilitation and renovation of the infrastructure**, both at primary and secondary but also at farm level, including provision of some **basic but vital machinery**.
- Addressing **water-related disasters** through an **integrated approach to watershed management**. The Aksu sub-basin offers an excellent opportunity for watershed management and for transboundary cooperation between Tajikistan and Kyrgyzstan.
- Completion of **canal automation project** on Khoja Bakirgan and its expansion in Aksu and provision of water measuring scheme to improve water use and contribute to data collection for more efficient planning of the resources.
- Support the MLRWR to create an efficient and user-friendly **Water Information System** (WIS) that would help in the development of viable basin planning process, among others. Initial stages of the WIS might concentrate on the completion of the **Infrastructure and asset Inventory System**, moving to developing a national WIS later**.**
- Enhancing policy dialogue and effective coordination on water both at national and basin level to develop appropriate national policies at central level and enhance their implementation at provincial and local levels. Similarly, establishing a **basin-based steering committee**, through the will-be established **Basin Council**, engaging the most important relevant stakeholders would enhance ownership and ensure sustainability of the future programme.

1. Introduction

In January 2013, SDC Management approved a project concept and agreed in principle to support Tajikistan's national water resources management programme until 2020 with about US$ 14 million (CHF 13 million) of financing.

The objective of the proposed programme is to strengthen Tajikistan's water resources management capabilities at the basin irrigation system and on-farm level to increase access to water and improve food security, reduce water-related disaster risks, improve livelihoods and raise socio-economic indicators in selected rural areas.

The programme envisages four major outcomes, including:

- Support the Ministry of Land Reclamation and Water Resources (MLRWR) to increase its capability and competence to manage and operate the river systems and structures and effectively contribute to the implementation of the newly agreed Water Sector Reform.
- Support irrigation service providers (Water User Associations, Irrigation and Drainage Organisations, such as would-be established MIROB) along Syr Darya basin to provide improved services to the farmers, contributing to improve water productivity and irrigation technologies at plot (farm) level.
- Support the establishment and development of Syr Darya River Basin Organisation as effective river basin management and planning institution and of Basin MIROB to effectively operate water delivery services to farmers/water users.
- Support 1-2 selected sub-basins of the Syr Darya Basin to enhance capacities and collaboration at sub-basin level across the Tajik-Kyrgyz border to effectively coordinate and support communities in watershed management and disaster risk reduction.

In March 2013, SDC contracted an international consultant (Nassim Jawad – Team Leader) and a national consultant (Anvar Kamolidinov - IWRM Specialist) to undertake a feasibility study along the Syr Darya and validate initially proposed programme components as mentioned above, through a comprehensive and participatory consultation with national, provincial and basin stakeholders. The mission would organise two stakeholder roundtables at provincial and national levels to validate its initial findings. These workshops would further enhance the quality of the final report with specific recommendations that would lay down a strong foundation for the programme development and planning but would further enhance policy dialogue.

2. Mission Schedule

The mission, accompanied by a SCO National Programme Officer (Anvar Sabzaliev) travelled some 2000 km along the Syr Darya and across the four main sub-basins of Syr Darya, namely Isfara, Khoja Bakirgan, Isfana and Aksu sub-basins, covering over 1000 km of primary, secondary and tertiary canals. In case of Aksu sub-basin, the mission travelled to the most upstream point in Rozrovut where the river originates from the North Flank of Turkestan Mountain Range.

The mission started its initial meeting at the MLRWR and met with the First Deputy Minister, accompanied by the Director of Swiss Cooperation Office, Mr. Peter Mikula. In Sughd, the mission visited the Deputy Governor of Sughd for an initial briefing meeting, informing him of the intended mission plans. The mission also visited the Sughd Oblast Water Resources Management Unit (Oblvodkhoz) of the MLRWR and 6 Rayon Vodkhoz (District Water Resources Management Unit) in Isfara, Konibodom, Bobojn Ghafurov, Jabbor Rasulov, Spitamen and the Khoja Bakirgan Canal Management (See list of people met in the annex for details). Furthermore, the mission met with the Heads of provincial Statistics, Agriculture and Emergency Departments and the Head of Rozrovut Jamoat in Ghonchi District.

Two Water User Associations (WUAs) and the Head of the WUA Federation of Khoja Bakirgan Canal, two WUAs in Isfara and one WUA in Aksu were also met during the mission. Several focus group discussions were held with farmers in each sub-basin to ensure more user participation in the process.

Other stakeholders met included relevant representatives of the United Nations Development Programme (UNDP), ACTED, German International Cooperation (GIZ), International Secretariat for Water (ISW) engaged in rural drinking water supply funded by SECO, Fardis, a consulting firm engaged in SECO/EBRD Khujand drinking water supply and Irrigation-Agricultural Consulting (IAC), a local NGO engaged in SDC's previous IWRM project. Two other local NGOs, Youth Group for Protection of the Environment (YGPE) and Zar va Zamin, an agrarian NGO, were also met in Khujand during the mission.

Two **Stakeholder Workshops** were held, one in Khujand and another in Dushanbe to validate the initial findings of the field trip at the end of the mission. The Workshop in Khujand took place on 22 April 2013 and was chaired by the Deputy Governor of Sughd Oblast. The Workshop in Dushanbe was co-chaired by First Deputy Minister of MLRWR Mr. Sulton Rahimov and Mr. Peter Mikula, SCO Director in Tajikistan.

3. National Policies and Strategies

There are several national policies and strategies that guide Tajikistan's social and economic development. These include:

1. National Development Strategy (NDS) 2005-2015
2. Poverty Reduction Strategy (PRS-3), 2010-2012 (last one)
3. Strategy for Living Standard Improvement 2012-2015 (successor of PRS-3)
4. Water Sector Reform Strategy of the Republic of Tajikistan (not finalsied yet)
5. Water Code of the Republic of Tajikistan 2012
6. State Water Programmes in Water Sector – up to 2020
7. Agrarian Reform of the Republic of Tajikistan 2009-2012
8. Food Security Programme for the Period 2015.

3.1. National Development Strategy (NDS) for the Period 2015

The NDS is considered the major national policy document, guiding Tajikistan's socio-economic development for a decade, 2005-2015. Until 2012, its implementation was undertaken through Poverty Reduction Strategy (PRS), three-year implementation strategy. The last PRS was developed in late 2009 for the period 2010-2012. In 2012, the Government of Tajikistan decided that due to significant reduction in poverty and a series of other priorities, the implementation strategy for the next three years would be called "Strategy for Living Standard Improvement (SLSI) 2013-2015".

According to NDS, Tajikistan has at its disposal real opportunities to accomplish its development and if utilized effectively these opportunities can lay a solid foundation for economic and social development. These opportunities include:

- Large potentials of hydropower resources and fresh water;
- Diverse mineral resources;
- Strong potential for the development of tourism;
- Availability of agricultural raw materials for industrial processing;
- Relatively large areas of undeveloped land suitable for agricultural use;
- Favourable conditions for the cultivation of environmentally sound food products;
- Advantageous strategic geographical position to leverage potentials as a transit country in future regional transport and communication; and
- Availability of a comparatively inexpensive labour force.

However, Tajikistan's economic development is influenced by a number of factors that could have an impact on its development processes. The country is landlocked and fragmented due to its geographic feature, with severe shortage in oil and gas, making it dependant on external sources. Its domestic market is relatively small and the political instability in its close neighbourhood, continued war in Afghanistan and repeated unrest and civil conflict in the Kyrgyz Republic, along with deteriorating relationship with Uzbekistan. Tajikistan is prone to natural disasters, given its

climatic conditions, coupled with continued deterioration of its environment caused by poor agriculture practices and unsustainable use and management of its natural resources, especially land and water.

Moreover, stable and sustainable economic growth that could eliminate poverty in the country faces with a series of challenges in relation to governance and legislative frameworks that call for serious reform and change.

The NDS, therefore, calls for a set of measures and if implemented effectively, they should meet the following criteria[2]:

1. Sustainable economic growth accompanied by progressive structural changes that would provide for economic diversification and for active participation of the private sector, based on market-oriented competitive economy.
2. Reforms should go beyond the economic sphere that would allow for creation of an effective (state) management system at central and local levels and with a judicial system that is fair and operates with integrity.
3. Reforms in relation to development of human potential, particularly education, healthcare and social welfare are described by NDS as long-term national priorities. Such reforms should ensure development of true social partnership, based on principles of promoting human rights.
4. Ensure stability in macroeconomics, through commitment towards a balanced fiscal policy, while improving inflation and maintaining stability in foreign currency exchange rate.
5. Institutional reforms are crucial elements in achieving national social and economic goals and objectives. Based on international standards and democratic principles, creation of Public Private Partnership (PPP) and Social Partnership would be vital steps towards sustained achievements in socio-economic development.

3.2. Strategy for Living Standard Improvement (SLSI) 2013-2015 (Poverty Reduction Strategy [PRS] until 2012)

The SLSI and its predecessor PRS serve as the implementation strategy for the NDS. PRS and now renamed SLSI are designed for a period of three years and their progress is regularly monitored by the Government, through the National Development Council (NDC), chaired by the President and through its development partners, the Development Coordination Council (DCC).

The NDC is comprised of key sector ministers, notably economic development and trade, finance, health, education, state investment committee and in the absence of the President, it is chaired by the Prime Minister. The DCC is comprised of 26 bilateral, multilateral and United Nations agencies and its chair rotates on an annual basis.

[2] National Development Strategy of the Republic of Tajikistan for the Period 2015

On 6 and 11 December 2012, the Development Forum of Tajikistan, comprised of the NDC and DCC reviewed progress on PRS-3 for the period 2010-2012, and the following lines summarize the review report:

- **With regards to Macro-economics**, Tajikistan withstood the 2008-2009 global downturns better than expected, thanks partly to prudent economic management and partly to timely budget support from several development partners. Remittances in 2009 reduced by 30% from US$ 2.3 billion in 2008 to US$ 1.6 billion and international prices were lowered for cotton and aluminium, the two major export items from Tajikistan. However, by 2010, international cotton price rose by almost 100% and remittances, mainly from Russia grew to a record US$ 3 billion. At the same time, budget support from several DCC members, totalling around US$ 288 million helped the government maintain public expenditure on health, education and social protection mitigating the impact of crisis on poverty and vulnerability.
    - By 2012, the economy recovered from the 2009 slowdown and outlook for the medium-term is favourable, by GDP growing by 6.5% in 2010, 7.4% in 2011 and 7.5% in 2012, partly thanks to increased remittances. Remittances contributed 45% to GDP growth in 2011 and 46% in the first 9 months of 2012, while services, industry and agriculture were other main contributors to GDP, with 13%, 10.4% and 9.8% respectively. Inflation subsided in 2012 but remains susceptible to higher global, fuel, food and commodity prices.

- **With regards to Millennium Development Goals (MDGs),** strong growth over the past decade has helped reduce poverty substantially from 47% in 2009 to 39.6% in 2012, according to official statistics, although Tajikistan remains the poorest country in Central Asia. Tajikistan's progress towards achieving its MDGs remains uneven.
    - According to UNDP 2010 progress report, 13 of 32 MDG target indicators for 2015, or 40% are likely to be achieved; an additional 13 are possible but six target indicators seem to be impossible to be achieved.
    - Access to essential public services and their quality, in particular electric power, health and education require significant improvement.

- **With regards to private sector development,** Tajikistan became a member of the World Trade Organisation (WTO) in March 2013 and the WTO General Council recommended enactment of a series of reforms to Tajikistan on 11 December 2012. Tajikistan's membership of WTO thus marks a significant step towards establishing a more transparent and predictable trade and foreign investment environment.
    - The recently approved Land Code (August 2012) is one of the most important achievements of the ongoing agrarian reform process, providing for Land Use Rights to be lifelong, inheritable, exchangeable and tradable, all essential preconditions for small farms and rural

households to make their own production decisions and stimulate private sector development in agriculture.

- The revised Tax Code approved in September 2012 and due for implementation in 2013, simplifies tax administration, making it more efficient, and, indirectly, enhancing incentive for private investment, by reducing the number of taxes from 21 to 10, through consolidation and applying a more efficient approach to Value Added Tax (VAT).
- The Law on Public Private Partnership (PPP) submitted to the Parliament for approval in August 2012 and due to be approved soon, will offer a viable option to attract investment in key sector, such as energy, infrastructure, transport and potentially in health and education.

- **With regard to energy security, food security and connectivity – three Presidential Priorities for SLSI 2013-2015,** the government has initiated several reforms designed to enhance the country's energy independence, although results remain to-date modest. Areas of improvement include:
  - Improved billing and more transparency and accountability of the country's electricity provider – a State Unitary Enterprise – its billing system as well as the nationwide use of energy efficient bulbs. Other plans in energy sector include adoption of a Law on renewable energy sources as well as approval of a five-year programme (2012-2016) for more effective use of hydropower resources.
  - Food security, mainly focused on increased production, is a key goal of the ongoing comprehensive agrarian reforms since 2009. The Agriculture Reform Programme for the period 2012-2020, approved by the Government of Tajikistan in August 2012 with its 22-point Action Plan, includes measure aiming to expand farmers' access to inputs, irrigation, and improving management and use of natural resources. However, nutrition and food insecurity remain a challenge and current estimates indicate that the share of inadequate food intake in 2011 ranged from 9% in Khatlon to 24% in GBAO (FAO/WFP 2011) and almost one in three children is chronically malnourished (UNICEF/World Bank 2012).
  - Given Tajikistan's landlocked, mountainous terrain, improving internal and external connectivity remains vital for high rate of growth. According to an Asian Development Bank (ADB) assessment in 2011, pavement on 75% of the country's highways is lost partly or completely and up to 80% requires rehabilitation and extensive repair. However, the Government of Tajikistan, with external support, has made every effort in the past few years to rehabilitate and build anew its roads network, with the priority to connect the centre with

its regions and with the neighbouring countries in the North and in the South[3].

Objectives and main priorities of the Strategy for Living Standards Improvement are: ensuring social and economic development and increasing the middle-class population. Its specific objectives are, as stated in the SLSI document from December 2012: "*In order to quickly stimulate economic development growth and by this mean to improve the living standards of population within the framework of the National Development Strategy, the Government resolutely aims to: address the issues of sustainable macroeconomic development; improve public administration; promote real economic sectors; diversify production; strengthen its export potential; improve the investment climate; support entrepreneurship; ensure social protection; expand the labour market; and strengthen human resources*."
"*In this context, the Government is planning on further development options and gradually improving the population's standard of living in terms of energy independence, food security, infrastructure and communications development.*" [4]

3.3. Agrarian Reform of the Republic of Tajikistan 2009-2012

In July 2009, the Government of Tajikistan passed a Resolution (Resolution #406 from 2 July 2009) to undertake comprehensive reform of all sector ministries and state agencies in and around agriculture. These included: Agriculture Sector Reform; Land Reform; Water Sector Reform; Local Governance Reform, with special attention to agriculture management; Alternative Financing and Social Protection for most vulnerable groups of people who might be negatively affected by the agrarian reform. The resolution also called for two specific programmes to be developed for the next 10 years, namely Agriculture Reform Programme 2010-2020 (now 2012-2020 due to delays) and Social Development Programme 2010-2020 (not yet finalised).

Objectives of the Agrarian Reform Programme of the Republic of Tajikistan are:
Based on the principles of Resolution #406 of the Government of Tajikistan, the **overall objective of agrarian reform** was to "*develop a productive, profitable, and sustainable employment-creating agricultural system, based on ecologically sound use and management of natural resources, making agriculture the backbone of the Tajik economy*". This objective can only be achieved through the **private sector and farming communities,** with **state** agencies and institutions creating an environment conducive to appropriate national **policies and strategies,** and the further development of private sector–led agriculture.

[3] For the full review of PRS-3 for the period 2010-2012 and proposals for SLSI for the period 2013-2015 refer to "Tajikistan: 2012 Development Forum", Presentation by Development Coordination Council (draft) – 30 November 2012

[4] Strategy for Living Standard Improvement (SLSI) 2013-2015, Government of Tajikistan, December 2012

In support of this overarching goal, **specific objectives** are as follows:

- To enable farmers **equitable, long-term access to land,** based on gender equality principles;
- To ensure farmers regular access to adequate irrigation;
- To allow farms and farmers to develop their own organisations, **associations, and cooperatives,** and to **freely choose what they want to grow** and where they want to market their goods, without interference from national or local authorities;
- To develop **financing mechanisms** that are sustainable, affordable, and fair, based on free market principles.

Therefore, the ongoing policy dialogue has put much emphasis on changing attitude and the thinking of government officials. The process has also been much about creating a **conducive platform for dialogue** between government and its development partners to meet regularly, to agree on common issues and how those are to be addressed, thus **establishing confidence, trust and mutual respect**.

In September 2012, the Government of Tajikistan announced the achievements of the Agrarian Reform process for 2009-2012 during the "International Agrarian Conference of the Republic of Tajikistan". Though the process of policy dialogue between government and its development partners continues, some major achievements include:

- **Resolution #111 on Freedom to Farm:** In order to reduce and eventually eliminate the influence of local authorities on agriculture management, this Government resolution, passed end of 2007, has had huge impact, reducing complaints by farmers (on local authorities' domination of cropping and marketing patterns) from almost 80% in 2008 to around 25% in 2012. The central government is determined to continue the process and enforce Resolution 111 to 100%.
- **Amended Land Code:** In August 2012, the Parliament approved the amended Land Code and the President of the Republic of Tajikistan formally signed the Code into a new Law for implementation. The amended Land Code provides for equitable Land Use Rights (LUR) to farmers that are lifelong, inheritable, exchangeable, and tradable and once land markets and land valuation systems have been developed, LUR would become marketable and certificates can be used as collateral for loans and credits from banks. The specific working group on Land Code is currently developing viable regulations for the implementation of the new Land Code.
- **Mortgage Law, Dehkan Farm Law, Cooperative Law and Roadmap for the reform of local government structures** have also been developed and await approval by the Parliament, aiming to further facilitate private sector-led agriculture growth.
- **Sector Diversification and Institutional Reform of the Ministry of Agriculture Roadmaps** provide further ground for private sector development and would enable farming communities to diversify the

agriculture sector in a manner that is more productive and profitable and is market-oriented.

- **Developing Sector Strategies for 2012-2020**: Following the endorsement of the reform agenda, four sector ministries/agencies are currently working to develop their sectoral strategies for the next 10 years, based on the principles of the Agrarian Reform and existing national policies, strategies and resolutions, along with viable investment plans for each sector strategy. These include: **Agriculture Sector Strategy; Water Sector Strategy; Land Sector Strategy; and Social Development Programme for Rural Areas.**
- **Water Sector Reform:** has been at the heart of the Agrarian Reform, considering that agriculture consumes over 90% of the water resources. The ongoing water sector reform foresees future water resources to be managed at hydrological boundaries, river basin approach, based on principles of Integrated Water Resources Management (IWRM).
- Considering its importance for the purpose of this feasibility study, the following chapter provides detailed description of the water sector reform process.

3.4. Water Sector Reform

Key priorities in the Agrarian Reform Programme included agriculture, land and water sectors reform based on priorities of the Poverty Reduction Strategy (PRS) for the period of 2010-2012 and have been taken forward for the Strategy for Improvement of Living Standard (SILS) for the period 2013-2015 along with energy.

Water Sector Situation Analysis: Currently, water resources management and protection functions and related responsibilities are divided between a number of different ministries and departments. This leads to the difficulty of coordinating water management. Relations between state stakeholders/water use agencies and ministries (agriculture, energy, industry, environment, tourism and so on) are weak, aside from a National Water and Energy Council that are currently being further developed to undertake the responsibility of a national water council.

Similarly, relations between national, provincial and district water authorities are not clearly defined, especially as provincial and local authorities have to report to the provincial and local Hukumats, a sort of double sub-ordination.

Last but not least, lack of clarity in relations between water users in agriculture, in other words the farmers, and WUAs and between WUAs and local Hukumats further complicates the institutional set-up of the water sector.

This is further exacerbated by multiple subdivisions and parallel powers of public authorities at the national, regional and district levels. There are no provisions in Tajik legislation that require state agencies to systematically carry out the necessary reforms, even though these state agencies do bear part of the responsibility for the

improvement of water legislation[5]. While the amendments recently (April 2012) introduced into the Water Code[6] call for the creation of institutions based on the basin principle as well as implementation of the Integrated Water Resources Management (IWRM), the current water legal framework cannot provide a full range of legal clarifications for details required for the relevant reforms and needs to be judiciously revised and/or amended.

Irrigation and Drainage: The basis of irrigation and drainage infrastructure consists of large-scale systems constructed during the Soviet era, in 1930s-1980s. This multifarious irrigation and drainage system represents a complex infrastructure from the point of view of technical equipment and technology of the services, including: polytypic water intake structures, some 480 pumping stations of various type and capacities; small and large irrigation canals with total length of 29,800 km, 13,100 km of different drainage networks and structures, over 1800 units of land reclamation, irrigation and monitoring wells, some 370 units of electricity transformer substations and around 146 km of power transmission lines, 10 water reservoirs of irrigational and power value, and other support infrastructure. In the meantime, much of the infrastructure has worn out and with continued lack of financial resources and the inability of the water sector to recover costs, much of the infrastructure and technology keeps deteriorating.

Of 748,250 ha of irrigated land in 2012, about 58% is served by gravity irrigation systems along with canal networks which are physically worn out for more than 50%. The irrigation area served by the pumping stations and engine-operated wells in 2012 was estimated at 350,000 ha, or around 45% of total irrigated area in the country. Annual water lifting by pumping stations and wells up to a height of 100 meter is more than 4 billion m^3.

In view of limited alternative energy sources, including carbohydrate and development of power generation, Tajikistan depends much on hydropower systems. The total hydropower potential of Tajikistan is estimated at around 527 billion kw per year. However, so far, less than 5% of this capacity is developed.

Energy: The largest hydropower plant in the Republic of Tajikistan is Nurek Hydropower Plant on the Vakhsh River with a capacity of 3,000 MW and annual output of 11.2 billion kW of electricity. Additional plants are successfully operating with a total capacity of 285 MW on the River Vakhsh. Other Hydropower Plants are Cascade of Varzob with a total capacity of 25 MW on the Varzob River, the Syr Darya – Kairakum - with a capacity of 126 MW, and the Pamir plants with a total capacity of 28 MW.
A strategically important site of future hydropower generation is the Roghun HPP. Once fully constructed it will present one of the biggest hydropower plants in Central Asia with a capacity of 3,600 MW generating over 13 billion kW/year.

[5] The Water Code, the Law on Water User Associations, the Law on Drinking Water and Drinking Water Supply, the Law on Nature Protection and other laws which relate to the use and protection of water resources.
[6] April 2012.

Considering the importance of pump stations and engine-operated wells particularly during the spring months when farmers most need irrigation water, irrigated agriculture and hydropower are closely linked. In years with insufficient precipitation in April and May and continued lack of access to power, farmers often lose a significant share of the agricultural crops. Therefore, increased energy production and expansion of the national power transmission lines play an important role in the regular provision of water supply and irrigation that would in turn enhance agriculture production and improve food security.

Natural Disaster Risks: High mountains together with relatively high precipitation in mountainous areas and disappearance of some of the strategically important forests as well as overgrazing, make Tajikistan vulnerable to natural disasters. Further expansion of agricultural land, residential areas as well as expansion of national highways and similar infrastructure would further contribute to natural disasters, if not well planned and managed. Flooding, large-scale inundations of lower floodplain areas and erosion of banks and riparian lands of the rivers; flash floods, mudflows and landslides are among common natural disasters in the country.

Over-exploitation of natural resources and poor irrigation and agriculture practices are already affecting agriculture and in turn people's lives and livelihoods and without specific measures to address these issues, the long-term sustainability of the precious water resources cannot be guaranteed. Some of the main issues affecting the water resources include: over-exploitation of surface and groundwater; deforestation of catchment basins of the rivers; rising groundwater table and as a result intensive salinity; systematic reduction of glaciers due to a whole series of influences. Therefore, urgent attention is required to apply specific measures nationwide that would allow for systematic conservation of natural resources and therewith of the ecosystem as a whole.

3.5. Water Sector Reform Strategy (Latest draft: April 2013)

Considering the analysis of the current situation, the need for comprehensive reform of water sector is vital in order to improve the water management efficiency, effectiveness and quality and to enable the implementation of the comprehensive Agrarian Reform agenda, especially as agriculture consumes over 90% of the water resources. Following three years of extensive work by the Government of Tajikistan, in particular the MLRWR, supported by its development partners, the final draft of the Water Sector Reform Strategy was reviewed and revised in April 2013. However, this document is foreseen as draft and might undergo additional changes over the next few months, yet it is expected that the substance would remain the same.

The following paragraphs offer an overview of the draft strategy for the implementation of the comprehensive water sector reform. It is important to note that the MLRWR with support from its development partners is also planning to develop an investment plan as part of the implementation plan for the strategy at a later stage.

Objectives of the Water Sector Reform: Based on international definitions of IWRM, the **overall objective** of the water sector reform is: "*an efficiently planned, developed and managed water sector based on sound policies, joint analysis and management of groundwater and surface water quantity and quality, balances the different sectors that use water, using the basin as the management area, aiming at the best economic benefit for the republic of Tajikistan, in a fair and equitable manner without compromising the ecological integrity and respecting water needs of downstream countries".*

However, the **Working Group on Water Sector Reform** considers the following statement for the **overall objective** more suitable to the prevailing conditions in Tajikistan: *"The integrated water resources management - is a management system of water resources based on interaction of various branches with the objective of availability of good quality water for water supply of the population, ensuring proper sanitation, water for Irrigation, hydropower, environment and other users in river basins, following hydrographical boundaries to delineate management areas, promoting safety of water sources from over-exploitation and pollution, providing protection of banks and riverside territories from flooding and scouring, allowing participation of representatives of the public in the course of decision-making, planning, financing and development of water resources in the interest of sustainable development of the society and preservation of the environment."*

Specific objectives of the water sector reform strategy are:

1) **Water management** areas changed from territorial administrative to **hydrological and geo-hydrological** management areas.
2) Efficiently functioning **IWRM-based institutes** at national level take care of policies and regulations that allow efficient coordination across sectors and interest groups, and at different scales, from local to international.
3) **Transparent and accountable water governance** institutes through separating tasks in policy and regulatory, organizational and regulatory, and operational functioning following modern efficient and performance based management principles. The policy making regulatory institutes focus on the public and common interest, the operational institutes on best operational practices.

It is essential to have **stakeholder involvement** at all levels and during all phases of the institutional reforms to ensure support and ownership and focus on the priorities and problems of the general public.

The water sector reform aims to lay the foundation for application of Integrated Water Resources Management (IWRM) in Tajikistan, based on decentralization and devolution of parts of service delivery in the process of division of responsibilities between the Government of the Republic of Tajikistan and the civil society at large. The proposed reforms are based on common regulatory principles of IWRM and focus on taking into account **social, economic and environmental interests** through sustainable and balanced management and development of water resources.

The boundaries of basins of large-scale rivers will determine the areas of water resources planning and management. **Four main basins** of river systems - Syr Darya, Kofarnihon, Vakhsh and Panj will be gradually adopted as the new management areas. River basins form the most appropriate management areas for effective water management while a **separation of functions** between policy and strategic guidance on the one hand and operational functions on the other hand will be the basis for an efficient institutional framework. Apart from this separation of functions, **water user associations** will gradually absorb more management tasks at the local level and multi stakeholder river basin councils will provide an appropriate participation mechanism for all stakeholders.

Institutional changes for IWRM introduction will be taken in parallel and in concord with reform implementation process. Separation of policy and strategic regulatory from operational functions in water resources use will be the main principle governing the changes in management and the current institutional structure. Consequently, institutional changes will be implemented at all levels with the purpose to facilitate the division of the two main functions as follows:

- **Policy and strategic management: At the national level,** extending the mandate of the National Water and Energy Council to IWRM issues, increase effectiveness of the Secretariat which provides technical services and creation of the Ministry of Integrated Water Resources. Their tasks will include the integration of water resources policy, strategic guidance, protection, management and planning functions, as well as the consolidation of all aspects of water resources monitoring (including licenses and permits). The basin organizations will be responsible for the policy implementation and other IWRM-related supervision functions at the sub-national level.

- **Operational Functions (Operation, Maintenance, Routine Repairs)**: Transfer of these functions for different uses to Service Providers (private or state enterprises) under the coordination of the government. These tasks include the fields of supply of drinking water and sanitation, irrigation, hydropower, industry, fishery, boating and recreational purposes, environmental or ecosystem services, as well as any other use of water.

- For **irrigation and drainage systems**, operational functions will be carried out by the **State Unitary Enterprise (SUE) MIROB** with subdivisions at the basin level, (and where appropriate, at sub-basin level) and at the scheme level. Basin MIROBs and particularly Scheme MIROBs will be operating in the future in close cooperation with water users and their representatives, WUAs. Operation of rural water supply, sewerage and sanitation issues are already assigned to administration of the SUE KMK and their sub-ordinate companies. In the large cities of Dushanbe and Khujand, as well as in some medium-sized cities the authority on water supply and sewerage is delegated to companies under the supervision of the Municipalities.

- **The Basin Organisations under the Ministry of Water Resources will coordinate the activities of different service providers** and determine water allocation between different Sub-sectors.

3.6. Water Code of the Republic of Tajikistan (amended in 2012)

The Water Code is the main legislative framework for water sector use and management. The first version of the current Water Code was developed in 2000 and adopted for implementation in December 2000. In the meantime several amendments were made in the Water Code, notably in 2006, 2008, 2009, 2011 and lately in 2012.

In 2011, initial discussions started on the amendments into the Water Code, including some proposals by development partners. However, many of the proposals could not be taken into consideration due to the fact that the 2011 version had already been viewed and revised by relevant ministries and agencies of the Republic of Tajikistan. Yet several provisions were brought into the new Water Code by the Parliament and approved for adoption in April 2012.
These amendments, taking into consideration the ongoing Agrarian Reform processes, clearly call for Tajikistan's water resources to be managed along hydrological boundaries, River Basin approach, based on principles of the IWRM.
The following sections and articles clearly pave the way for the water sector management to be restructured along IWRM principles.

- Section 1: provides directives for general provisions, including construction works for infrastructure as a whole and for water protection zones in particular.
- Section 2: provides rules and regulations for water sources and their efficient use as well as for water users and their rights and responsibilities. It provides detailed description of the rights of water users and their roles and responsibilities in water use and management. Chapters 9-18 of Section 2 provide directives for the different uses of water, including agriculture, industry, energy, tourism, environment, fishery, waste water treatment, among others as well as treatment and addressing water related disasters. Chapter 19 of Section 2 is dedicated to exploration of water reservoirs, and the last chapter addresses issues related to water disputes.
- Section 3: chapter 21 and 22 of Section 3 address issues of protection of water resources from harmful influences and its prevention from falling into harmful conditions with specific measures.
- Section 4: is dedicated to water management, emphasising on state control of the water resources and issues of accountability and effective and efficient water planning and use. In view of the ongoing water sector reform processes, this chapter is crucial in that it clearly states that: "future development and management of water resources must be based on principles of IWRM along hydrological, hydrographical boundaries while taking into account the interest of all

water users…" (Article 40-1 of the new Water Code, April 2012). This article also provides directives for the organisation of basin management authorities to be established, along with "Basin Council", along with specific competencies for the Council, where all stakeholders would be its members. Article 140-3 provides for the establishment of "National Water Council" made up of the heads of relevant sector ministries and agencies (i.e. different water use agencies), representatives of NGOs and civil society as well as competent technical experts. Article 140-4 provides for the "National Water Council to be established in line and in accordance with IWRM principles…" while article 140-5 clearly defines that "future water resources use and management must be developed through basin plans both for water use and its protection…"

- Section 5: of the Water Code addresses issues related to "Responsibility on breach of water legislation…" (Chapter 24, articles 141-146 of the Water Code from April 2012).

3.7. State Programmes Related to Rural Water Supply, Irrigation and Drainage and Water Related Disasters Mitigation

There are several state programmes related to the water sector, including rehabilitation, amelioration, riverbank protection and improvements of pumping and drainage stations. Programmes range between 4 and 12 years but lack of sufficient financial resources has left much of these programmes on paper, unfortunately, despite some efforts by developing partners, specifically the Asian Development Bank and the World Bank to address some of these issues of national interest. Some major state programmes include, among others:

1. **Programme on improving of amelioration condition of agriculture irrigated lands in the Republic of Tajikistan for 2010-2014" adopted by GoT Resolution # 612 from 31. 10.2009:** Implementing measures on improving of ameliorative condition of the irrigated lands and ensuring high productivity of soils, high yield of the crops it is necessary to undertake the following tasks:

   - Repair and rehabilitation of open and closed drainage networks;
   - Rehabilitation of meliorative pump stations and drainage wells to discharge ground water, especially areas affected by high water table;
   - In order to ensure regular activities of meliorative pump stations and wells provision of regular electricity supply is a must throughout the whole year;
   - Water productivity should be addressed through systematic reduction of water losses from canals and on-farm irrigation networks.

2. **"Programme for rehabilitation of pump stations' pressure pipelines in the balance of the Ministry of Land Reclamation and Water Resources"**

adopted by the Resolution of Government of Tajikistan #235 from 29. 04.2009: From 742,000ha irrigated land in Tajikistan (2009), pump stations irrigate 48.5%. Pump units and pressure pipelines that were constructed between 1958 and 1977 are worn out as these have been utilised 2-3 times of their planned lifetime. Therefore, it is necessary that the infrastructure is effectively rehabilitated and where necessary renovated.

3. **«Programme on improvement of water supply to the people of the Republic of Tajikistan for the period 2008-2020" adopted by the Resolution of Government of Tajikistan #514 from 02. 12. 2006: The** existing Water supply systems were constructed between 1960 and 1980. Over the last 10-15 years these systems were not properly maintained through appropriate operation and maintenance (O&M) interventions. As a result, the infrastructure is in unsatisfactory condition and requires urgent rehabilitation. Considering the current delivery of water to the population (unable to cover the required needs) and predictable population growth until 2020, rehabilitation and renovation of water supply system is estimated at around US$ 1 billion. This programme is not being effectively implemented due to scarce financial resources at the state disposal and requires urgent attention.

4. **"State Programme on riverbank protection in the Republic of Tajikistan for the period 2011-2015" adopted by the Resolution of Government of Tajikistan No. 112 from 03 March 2011.** Tajikistan is a mountainous country with **947 rivers and 276 *soys* (smaller rivers and/or tributaries) with a total length of about 30,000 km** with most of the watercourse endangered by regular mudflow.
   With the aim to reduce the **impact of natural disasters**, especially mudflows and flush floods in the country, adaptation of specifically designed **preventive measures** are necessary by relevant institutions of the Government of Tajikistan. Such measures must ensure protection of agriculture lands, roads, bridges and other important public objects and infrastructure, particularly from mudflows and flush floods.

   To achieve this goal, relevant ministries and agencies and provincial and local authorities of the state are directed to develop and undertake national programmes to be financed in the order of priority from existing state budgets. The MLRWR as the lead agency will supervise and coordinate activities of all relevant state agencies at national and local levels and would ensure attracting foreign investment to substitute existing but limited state financing.

5. **«State Programme on irrigation of new lands and rehabilitation of irrigated lands that have fallen out from agriculture use for 2012-2020" adopted by the Resolution of Government of Tajikistan #450 from 8 August 2012:** The main objective of this programme is to increase

agricultural efficiency, improve and increase employment opportunities for the rural population, and subsequently improve livelihood of the population of Tajikistan. Recent comparative analyses of population growth in Tajikistan indicate that by 2025 unit area of irrigated lands per inhabitant in Tajikistan will further decrease to 0,08 ha. However, considering the size of irrigated land that continues to be affected by high water table and as a result by salination would further reduce access to irrigated land to a mere 0,06 ha per inhabitant.

These alarming figures call for a state programme of investment and provision of necessary grants and capital for the period of 2012-2014 in order to address the shortcomings during the next decade.

In particular, the Programme envisages: Improving of ameliorative condition of 811 ha lands in Mastchoh, Jillikul, Shahritus, Dangara, and irrigation of 250 ha new lands in Jirgatal and Roshtkala districts; Irrigation of 1050 ha new lands in Vanj, Istarafshan, Roshtkala, Jirgatal, Shugnan and Darvoz districts; improving of ameliorative condition of the lands in A. Jomi district; Irrigation of dehkan farms on the base of Utkensay mudflow reservoir through reconstruction of Rahmatabad water reservoir in B Gafurov district. Total cost of these projects is estimated at around US$ 560 million, including state investment, credits from international financial organizations and grants.

4. Stakeholder Analysis

There are a number of national and international organisations engaged in the water at national and regional levels. The mission met key stakeholders directly engaged in the water sector in Sughd Oblast and more specifically those working in and around Syr Darya Basin.
Much of the report is based on meetings with these stakeholders, including WUAs and focus group discussions with farmers. There are numerous state and non-state organisations engaged in the water sector. For the purpose of this report we will concentrate on some key agencies and institutions.

4.1. Key State Institutions and Organisations in Water Sector

Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan (MLRWR): is the principle agency of the Government of Tajikistan (GoT) in charge of the water resources management of the country. The Ministry carries out functions in development of an integrated State policy and normative legal regulations in the sphere of reclamation of irrigated lands, operation and maintenance of water facilities, formation, use and protection of water resources, construction of water facilities on the basis of the legislation of the Republic of Tajikistan. The MLRWR has branches at the provincial (Oblast) level, **Oblvodkhoz,** and district level (Rayon),

Rayvodkhoz, working under directions of the Ministry and supervision of provincial and local authorities.

Executive Office of the Sughd Oblast (Province) Government: Headed by the Chair of the Province, all central Government Ministries and state agencies are represented in Sughd Oblast. These include: Oblast Offices of MLRWR, Ministry of Agriculture (MoA), State Committee on Land and Geodesy, State Committee on Emergency Situations, State Committee on Environment and other social and economic agencies. For the purpose of this report we will concentrate on those state agencies that have some direct or indirect relations to the water sector.

Head of the Sughd Oblast Directorate of Water Resources Management (Oblvodkhoz) is charged with the overall regulation and management of the water resources at provincial level. While supporting the water sector reform initiative fully, the Head of Oblvodkhoz mentioned that the central government must take a political decision. Emphasising that IWRM and basin approaches are the only way out of the current crisis in the water sector, he put institutional reform at central and provincial level as the top priority for the reform. Such institutional reform must entail clear roles and responsibilities for all stakeholders, from users to WUAs, from WUAs to future basin and MIROB organisations. With regards to support for WUAs, the Head of Oblvodkhoz mentioned strengthening them technically and managerially as well providing them with specific mechanisms that would guarantee their financial basis and with support with some basin machinery allowing them to regularly clean, rehabilitate and maintain the infrastructure. In support of the canal automation project, he mentioned the importance of additional water distribution mechanism, especially water meters at secondary canals and on-farm. Last but not least, the Oblvodkhoz Head requested specific support in regional consultation, especially between Tajikistan and Kyrgyzstan with particular emphasis on Khoja Bakirgan.

District Offices of Water Department (Rayvodkhoz) are responsible for the day-to-day management, planning and operation of the water resources. Where available and reliable, they work with WUAs for the water distribution and collection of fees. The five Rayvodkhozes visited during the mission, all supported the reform implementation, support to rehabilitation of infrastructure as well as extensive support to WUAs with the aim to make them reliable, capable partners with technical, managerial and financial skills and capacities to effectively mediate between water users and water authorities. One major issue mentioned by all Heads of Rayvodkhozes is to fully legalise WUAs and ensure future on-farm infrastructure is in their balance so as to avoid conflict of interest between them and the water users. Cotton sector was cited as the largest debtor for water and they hoped with the reform implementation these and similar issues would be addressed sustainably.

Office of Khoja Bakirgan Canal Management Unit: Khoja Bakirgan is one of the main sub-basin in Syr Darya Basin with transboundary characteristics. Khoja Bakirgan River originates in Kyrgyzstan (Turkistan Mountain Range), passes halfway through Kyrgyzstan then transfers into Tajikistan before it reaches the Sur Darya. Khoja

Bakirgan Canal with a length of just over 49 km serves parts of Bobojon Ghafurov and Jabbor Rasulov Districts providing irrigation water to some 14,000 ha irrigated land. Gorodskoy, Kistakuz and several smaller canals also serve the area, along Khoja Bakirgan Canal. It is worth mentioning that together Bobojon Ghafurov and Jabbor Rasulov Districts are home to a population of 390,000 (excluding Khujand city) thus they are considered the two largest districts in Sughd. The only irrigation scheme in the region functioning according to river basin principles, the Canal Office is located in a neutral place at Chkalovsk Town between Bobojon Ghafurov and Jabbor Rasulov Districts and its creation was promoted by the previous SDC-funded Fergana Valley IWRM project. Part of the drinking water for the city of Khujand is provided from the main gate (intake at the beginning of the Canal).

Ministry of Energy and Industry (MEI): is the central authority responsible for development of energy sector, including hydropower and alternative source of energy as well as natural resources with particular emphasis on mines. The MEI develops policies and normative legal regulations for these sectors. The MEI works closely with MLRWR on issues related to water and hydropower. The **National Council for Water and Energy (NCWE)** has now been expanded with inclusion of other state stakeholders, especially drinking water, agriculture and environment with the aim to creating the future National Water Council that would eventually be charged with the development of major national policies related to the water sector and representing the interest of all water users (energy, industry, agriculture, drinking water environment, tourism, fishery and other users). The **European Union funded National Policy Dialogue (NPD) project implemented by United Nations Economic Cooperation for Europe (UNECE)** is working closely with the NCWE and the MLRWR to further strengthen the institutional set-up that would eventually lead to the planned National Water Council. Provision of technical assistance and establishment of a Secretariat to facilitate regular meetings and disseminate information to other governmental and non-governmental agencies and donors are some of the highlights of the NPD support.

Ministry of Agriculture (MoA): MoA represents perhaps the biggest stakeholder in the water sector, taking into account that the agriculture sector consumes over 90% of the water resources in the country. Over the past four years, MoA and MLRWR together with other state stakeholders have been meeting regularly as part of the ongoing Agrarian Reform process and this relation would be further developed through their active participation in the NCWE. This mission held Meetings with First Deputy Minister of Agriculture and the Head of the Agriculture Department in Sughd

State Committee for Environment Protection (SCEP): SCEP is the key state institution engaged in implementation of the integrated state policy in the sector of environmental protection, forestry, protected natural territories, hydrometeorology, rational use of natural resources and carries out the state control of the environment protection and natural resources management. SCEP plays a crucial role in the protection and allocation of water resources as well as forestry protection and rehabilitation, pasture management and in protection of natural water resources. It sets annual limits and diversion from natural water resources to water

users, especially for the MLRWR, through its hydrological and hydro-geological forecasts. SCEP has provincial and local branches around the country but this mission did not have an opportunity to meet with its representatives. However, discussions with a forestry representative in Rozrovut, near the Turkestan Mountain Range where the Aksu River originates, indicate that lack of financial and material resources is preventing them from protecting natural resources, especially the remaining forestry particularly those along the watersheds and rivers and deterioration of both pastures and forestry would continue without external support.

Committee of Emergency Situations: Is responsible for monitoring of disaster risks and emergencies preparedness and response. Though a military set-up, it works in close coordination with several other state agencies and ministries, especially environment (Hydromet), health and water, among others. The committee is also in charge of post-disaster response, such as provision of temporary shelter, water, food and medical support, in cooperation with other state agencies. Early warning and improved weather forecasting are critical elements for effective disaster management and mitigating risk of extreme weather events, such as intense precipitation, low temperatures and drought conditions. However, considering technical and financial limitations, neither the committee nor other state agencies have the means to provide the badly needed services. As part of its regional/transboundary cooperation, especially on water-related disasters, the emergency committee Sughd branch has been working with the authorities of Batken province (Kyrgyzstan) on a five-point framework agreement for closer cooperation and meet regularly in Batken and/or Khujand. Discussions are also ongoing between governments of Tajikistan and Kyrgyzstan for national directors of emergency committees on both sides during summer 2013 for a possible formal agreement on joint cooperation at national and provincial levels..

State Unitary Enterprise for Municipal Services, "Khojagii Manziliyu Kommunali" (KMK) and the Department of Rural Water Supply, "Tojikobidehot": Until 2012, KMK was responsible for planning, development and operation of drinking water, sanitation, sewage, landscaping and similar activities for cities and towns. In 2012, as part of the ongoing water sector reform, the MLRWR transferred the responsibility for supervision of Rural Water Supply Department, "Tojikobidehot" also to KMK. Subsequently, KMK has become the single largest State Unitary Enterprise (SUE) for urban and rural water supply, including irrigation water for towns and Rayon centres. Quality control, regular cleaning and rehabilitation as well as setting standard fees for water, communal heating and other utilities are all part of KMK's responsibilities.

Water User Associations (WUAs): Of the over 100 WUAs created in the Syr Darya Basin, 16 were created by the SDC-funded Fergana Valley IWRM along the Khoja Bakirgan Canal, 6 by UNDP in Isfara and Konibodom, 2 by World Bank in Konibodom, and 1 by ACTED. Another 11 WUAs were created by USAID-funded WUASP project (Winrock) in Zafarobod District and handed over to an Australian NGO for further development. The WUA Support Unit of Oblvodkhoz has created the remaining WUAs. The mission visited 2 WUAs and representatives of the WUA Federation in Khoja Bakirgan, two in Isfara, 1 in Spitamen, and conducted several focus group discussions with farmers, some with participation of WUA representatives. Most WUAs have been created on the basis of ongoing projects; some have been supported for a few years, others only for a short while. As a result, only few of the WUAs have some level of understanding of what they should be doing, what their roles and responsibilities are and how to respond to the growing needs of their members/farmers. None of the WUAs possess any economic, financial and/or technical capacities and in most cases WUA representatives are paid in kind for the work they undertake. Only two WUAs in Khoja Bakirgan were found to be well organised with individuals assigned at Mahalla level equipped with water meters and manage the on-farm water distribution well. Much of the rehabilitation and cleaning is carried out through communal voluntary work (*Hashar*) and cash contributions from farmers. Many WUA representatives complained that aside from some training, a few computers and office supplies there has been little support in creating sustainable associations with strong economic, technical and managerial basis. Many don't even have office premises to work from. Absence of a systematic approach to capacity building and institution development as well as access to basic machinery has already led to some WUAs falling apart while many others have lost their credibility vis a vis their members, the farmers. Most WUA representatives and supporting organisations cited absence of support for such associations from local authorities. In contrary, many local authorities see WUAs as a mere institution in collecting water fees. Similarly, as long as local authorities continue to interfere in the water sector and on-farm irrigation and drainage facilities and their rehabilitation, responsibility for Organisation and Management (O&M) is not legally transferred to them, these associations would continue to remain weak and unable to act effectively.

4.2. International Organisations, including Donor Agencies

Several international organisations, especially donor agencies have been and still are involved around in the water sector in Fergana. For the purpose of this report, however, we will concentrate on a few key agencies.

Asian Development Bank (ADB): has been actively engaged in the water sector in Tajikistan. Since 2003, two significant projects between Khatlon, Badakhshan[7] and Sughd have been implemented with the objective to improve living conditions of rural population in project areas through:

- Rehabilitation of irrigation and drainage infrastructure to improve water management;
- Improvement of selected potable water supply systems;
- Support to Agricultural development; and
- Support to policy reform with regard to farm profitability and cost recovery for (water) operation and maintenance.

The "Agricultural Rehabilitation Project" supporting Syr Darya and Panj Basins with a loan of US$ 43 million started in August 2003 and ended in September 2009. The "Irrigation Rehabilitation Project" supporting Syr Darya Basin, Panj Basin and Vakhsh Basin with a loan of US$ 28.99 million started in September 2005 and ended in August 2011.

World Bank (WB): The WB has been engaged in several large-scale projects related to water sector over the past 10 or so years. Its latest irrigation rehabilitation project through public works (PAMP II) funded by the Global Agriculture and Food Security Trust Fund (GAFTF) grant with a total budget of around US$ 45 million in Khatlon builds up on a previous project experience funded by the European Union (PAMP I). In Sughd Oblast (Syr Darya Basin), the WB continues its work on the "Fergana Valley Water Resources Management Project" (Tajikistan) with a total budget of US$ 24.17 million, of which US$ 1.17 million is the contribution by the Government of Tajikistan. The project was approved in July 2005 and started effectively in January 2006 with the objective to: 1) increase the coverage area for drained and irrigated areas in Bobojon Ghafurov and Konibodom Districts and strengthen the Early Warning System (EWS) of the Kairakum Dam as well as carry out a geotechnical survey to assess the risks associated with the dam. The project was planned to complete in May 2013, however, due to delays in activities, it is assumed that the project would be extended for another year to enable some remaining activities to be fully implemented.

According to the latest WB reports, around 79% of the total project funds have been disbursed as of April 2013, where some areas of target have been over achieved. The agricultural area to be returned to effective irrigation targeted 6,450 ha and 8,171 ha area has been achieved by the project. Of the 3,500 ha flooded and waterlogged

[7] The "Irrigation Rehabilitation Project" included irrigation rehabilitation, water supply improvement and WUA support also in Rushan district of Gorno-Badakhshan province.

land near embankments, some 3,385 ha has been completed. These achievements have been reached through: rehabilitation of 93% of envisaged tube wells; rehabilitation of all planned 9 large-scale pump stations; rehabilitation of around 50% of planned observation wells; rehabilitation of around 50% of planned primary irrigation canals and cleaning of 85% of planned drainage canals as well as rehabilitation of 70% of reservoir embankments.
Furthermore, the project has established 3 WUAS and is currently envisaging completion of an Early Warning System on Kairakum by July 2013. WUAs in the project areas have been supported with annual field demonstration initiatives for improved land and water use and management.
Reports also indicate that the WB is planning to prepare another large-scale project in support of the water sector in Sughd building upon the experiences of its current project.

United Nations Development Programme (UNDP): Through its EU-funded project "Promoting Integrated Water Resources Management and Fostering Transboundary Dialogue in Central Asia", UNDP had been engaged in Isfara Sub-Basin (Isfara and Konibodom Districts) 2009-2012. The main objectives of the project included: water efficiency strategies at national basin level, rural water supply and IWRM governance and institutional reform. The project has also created 6 WUAs in Konibodom and Isfara since 2011 and has introduced advanced irrigation technologies among WUA members, through a local NGO, "Irrigation Agrarian Consulting (IAC). Transboundary issues between Tajikistan and Kyrgyzstan have been addressed through the joint working group between the two countries, with specific attention to Isfara sub-basin, where joint actions and cooperation have been promoted through identification of possible areas for cooperation.
UNDP is currently seeking additional funding to continue its efforts in IWRM in Central Asia.

German International Cooperation (GIZ): through its "Water Management and Basin Organisations in Central Asia", GIZ is active in Sughd and Batken Oblasts of Tajikistan and Kyrgyzstan, concentrating on Isfara sub-basin since January 2012. With a current deadline in December 2014, the project aims to improve water management and strengthen transboundary river basin administration. The development of a Water Framework Agreement between Tajikistan and Kyrgyzstan is one of the crucial activities GIZ has undertaken recently. The initial draft of the framework was discussed between Ministries of water resources of Tajikistan and Kyrgyzstan in April 2013 and the two countries are now working to finalise the framework agreement in the coming months that would lay down a solid foundation for transboundary cooperation between the two countries.

European Bank for Reconstruction and Development (EBRD): Through its "Improvement of Khujand Water Supply System", funded partially by EBRD (credit) and SDC and the Norwegian Government, EBRD supports the single-largest drinking water supply in the Sughd Province. The initial phase of the project was 2003-2008 and the second phase started in 2009 and is intended to complete in 2014. The project has significantly enhanced access to safe drinking water for around 160,000

population in Khujand, or almost 60% of its population, with a total budget of US$13 million (including credits). The project has replaced some 700 km of water pipes, installed 40,000 water meters in the households and has fully rehabilitated three main pump stations, pumping water from wells as deep as 70 meters.
As part of its "Cooperation Development" project component, the project has established an efficient billing system that has improved water fee payment from 60% before the project to around 90% as of end of 2012. Similarly, an International Financial Reporting System (IFRS) has been set up for the Vodakanal (Water Authority) in Khujand plus structural changes that include enhanced Terms of Reference and job descriptions. Training, capacity building and institution development has thus been the central focus of the project. Along with safe drinking water supply, health and hygiene education and public awareness is aiming to further improve health conditions in the city.

Other international organisations include **Agency for Cooperation, Technical and Economic Development (ACTED)** with projects concentrating on Disaster Risk Reduction through Watershed Management approaches; **HELVETAS Swiss Intercooperation (HIS)** with activities on efficient water management techniques focussing on last mile of the irrigation, on-farm level, through extensive training and capacity building of WUAs; and **International Secretariat for Water (ISW),** an SDC-funded Canadian NGO, supporting drinking water supply improvements in Konibodom District of Sughd by applying active community participation and contribution, especially for Operation and Maintenance.

4.3. Local NGOs – Public Organisations

There are several local Non-Governmental Organisations (officially known as Public Organisations) engaged in water-related activities around Syr Darya. Considering their role and importance in the water sector, the mission visited a few select Public Organisations in Sughd.

Irrigation Agricultural Consulting (IAC): Established in 2008, with the mission to contribute in poverty reduction and raise living standards in rural areas through development of agriculture, irrigation and agro-business, IAC provides advisory services to farmers through practical field initiatives directly with farmers and WUAs to enhance land and water use and management. Its services are based on thorough assessment of target farms, including sociological research, followed by support in development of business plans, water use plans, improved water use technologies and similar activities, for the WUAs for instance. Training and education is central to IAC's work with farmers and WUAs that includes among others issues related to natural disasters and protection of environment.

Introduction of alternative crops and cropping patterns as well as advising farmers and WUAs how best to reduce water losses by applying local techniques, such as low-cost lining of on-farm irrigation canals, are among IAC's major initiatives. Farmers are advised in water efficiency and farm profitability by replacing cotton with potato, onion and similar crops that are more profitable.

IAC has been working closely with SDC's previous Fergana IWRM project as well as with UNDP on water productivity improvement at farm level and extensive support for the development and strengthening of WUAs in Khoja Bakirgan and Isfara.

Zar va Zamin: Established in 2007, Zar va Zamin provides consulting services to farmers and WUAs on agriculture technologies, improved irrigation technologies and farm mechnisation. The organisation also plays the role of mediator between state water organisations and WUAs in an attempt to improve the relationship between farmers and WUAs and WUAs and state water providing agencies (Oblvodkhoz and Rayvodkhoz). Zar va Zamin has been working with SDC's previous Fergana IWRM project and has a critical view of the project. While the previous SDC-funded project did not fully address issues related to WUAs and efficient water use technologies, its biggest failure was perhaps applying the same methodology in three countries (Tajikistan, Uzbekistan and Kyrgyzstan) with three entirely different socio-economic and political contexts. The organisation believes future projects must abstain from bringing in too many internationals, which may not be able to effectively respond to the growing needs of water users by copy-pasting experiences from another part of the world. Instead, future projects should maximise the use of some highly qualified technical and professional national experts, who have a much better understanding of the national and local contexts. In view of future initiatives, Zar va Zamin believes three major issues must be addressed: 1) Extensive support to rehabilitation of infrastructure, especially secondary and on-farm level; 2) Avoid short-term and quick-fix approaches to WUA development and ensure existing and future WUAs manage to obtain sustainable economic, technical and managerial as well as negotiation capacities and skills; and 3) Improving transboundary relations by improving knowledge base and institutions at national levels to effectively and efficiently negotiate, consult, coordinate and cooperate with each other.

Youth Group on Protection of Environment (YGPE): YGPE works on issues of environment and natural disaster - water and non-water-related. YGPE is the Lead Environment Group in the Provincial Council on Civil Society, created by the Sughd Oblast Hukumat, involving 6 Oblast state agencies, representatives of political parties, 2 university representatives and 4 local/provincial NGOs/Public Organisations. YGPE works closely with international organisations, such as WB, UNDP, ARRHUS, among others. Another area YGPE is engaged is the uranium waste sites at Taboshar and Dehmoy and their impact on water sources, and has published informational leaflets to raise public awareness on the situation.
YGPE believes future poverty initiatives, especially in rural areas, must take environmental issues serious, in particular efficient use and management of natural resources, specifically land and water. All future projects must be accompanied by intensive information campaign, especially with regards to water-related natural disasters, along with advocacy at local and provincial levels and offer feasible early warning systems.

Fardis Consulting Company: is engaged in a whole range of activities advising national and international organisations from legal to tariff issues and from project planning and costing to actual implementation, monitoring and evaluation

processes. Furthermore, the company provides support in the development of new institutions and financial system as well as in revising and restructuring existing institutions. Fardis has been the major national service and consultancy provider for the EBRD/Norwegian/Swiss drinking water supply project in Khujand.

4.4 Stakeholder Roundtables

Two stakeholder roundtables were organised by the mission to present and validate the initial findings of the mission. The first roundtable was held in Khujand on 22 April 2013, after three weeks of intensive field mission. Chaired by the Deputy Governor of Sughd, participants included heads of technical departments of the Oblast (agriculture, emergencies, statistics, environment and notable water), Heads of Rayvodkhozes, representatives of international organisations in Sughd and select representatives of WUAs and WUA Federations. The second roundtable was held in Dushanbe on 25 April 2013, with the help of SCO office in Tajikistan. Chaired by the first Deputy Minister of MLRWR and co-chaired by SCO Director in Tajikistan, Mr. Peter Mikula. Participants included representatives of relevant government ministries and agencies and representatives of development partners.

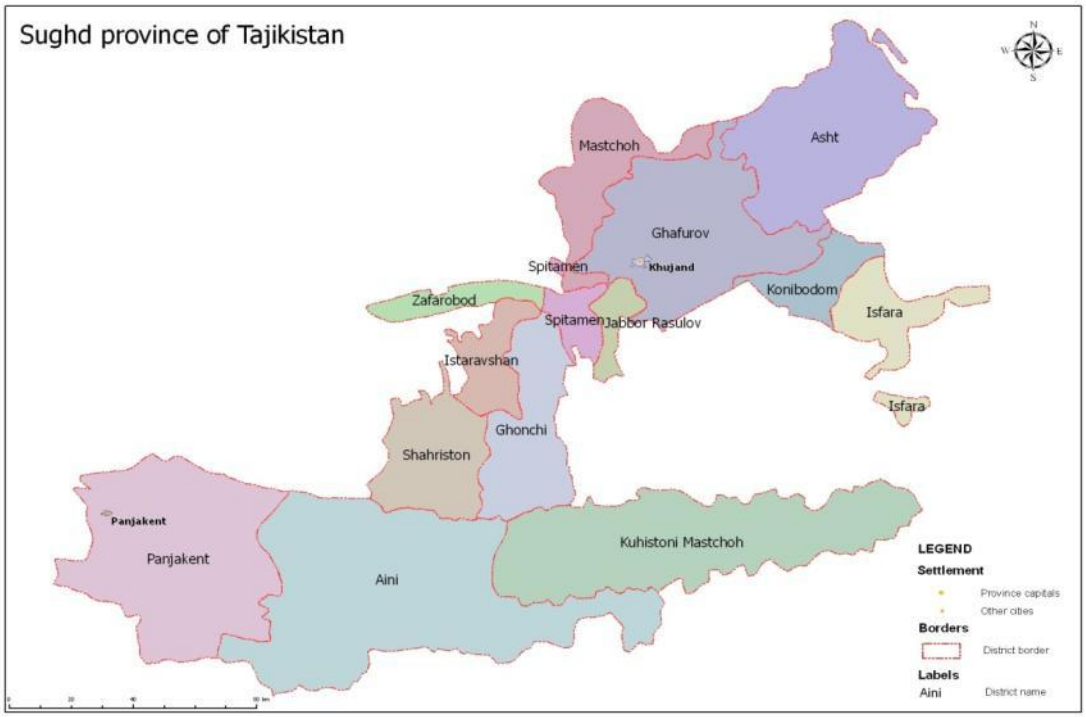
Stakeholder Roundtable in Khujand, 22 April 2013

5. Sughd Oblast - Demography and Geography

Sughd Province is one of the four administrative divisions and one of the three provinces of Tajikistan. Centred in the historical *Soghdiana,* it is located in the North-West of Tajikistan with an area of around 25,400 square km and a population of 2.35 million (as of 2012)[8], up from 1.87 million according to the 2000 population census, making up around 30% of Tajikistan's population.

Known as Leninobod, Sughd was found as a province of Uzbek SSR in 1924 and became a province of Tajik SSR, following efforts by Shirinsho Shotemur.
With Khujand as its capital with around 168,000 population (as of 2012)[9], Sughd is an important part of the Fergana Valley, bordering with Jizakh, Namangan, Samarkand and Fergana provinces of Uzbekistan, Osh and Batken provinces of Kyrgyzstan and separated from the rest of Tajikistan by the Zarafshan Ranges. The Syr Darya River passes through Sughd and is considered the largest basin shared between Tajikistan, Uzbekistan and Kyrgyzstan.

Administratively, Sughd province is divided into Northern districts of Asht, Bobojon Ghafurov, Jabbor Rasulov, Isfara, Istarafshan, Zafarobod, Ghonchi, Mastchoh, Spitamen, Shahristan and Konibodom; and Southern districts of Ayni, Panjakent and Kuhistoni Mastchoh. Aside from Khujand, other major cities are Istarafshan, Konibodom, Isfara and Panjakent with 60,200, 47,100, 40,000 and 36,000 populations respectively.



[8] Sughd Oblast Statistics Committee, 2012
[9] Sughd Oblast Statistics Committee, 2012

6. Sughd Oblast Economy

The economy of Sughd has been growing steadily since 2000, at the average rate of 13.2% in 2008 and 13.3% in 2009. In 2009, farming, trade and industrial production contributed 28.2%, 25.8% and 14.0% to the GRP (Gross Regional Product) of Sughd, respectively. Aside from cities and towns, vast majority of the rural population depend on agriculture. Since 2000, the output of industrial production increased two-fold, at an average annual growth rate of 5-8%. A free economic zone has been established in the province called "Sughd Free Economic Zone", further stimulating economic growth.
In October 2012, Khujand hosted the International Economic Forum, bringing together representatives of financial institutions, public associations and international organizations active in the country as well as representatives of foreign and domestic business structures and chambers of commerce and industry from a number of foreign countries.

6.1. Agriculture

Overall, agriculture plays an important role in the province's economy, not only producing the badly needed food for the region but also much of the cotton for trade as well as the growing cotton industry in the province. According to available statistics and following focus group discussions in the field, cotton makes up over 50% of the Gross Agricultural Output (GAO), followed by cereals, potatoes, fruit and vegetable. Fruit, vegetable and dairy and meat production are both on the rise.
Much of the cotton is exported as raw material. In 2012, Tajikistan harvested 418,000 tonnes of cotton and exported about 90% as raw material to countries with developed textile-processing capabilities, according to the Ministry of Energy and Industry. In 2012, the Sughd Oblast share in cotton export was estimated around 120,000 tonnes.

Tajikistan is steadily creating more cotton processing capacity. In the past three years, more than 15 enterprises for processing and production of cotton articles have been built or renovated in Sughd alone. Major weaving and spinning works have opened in the Yavan, Gissar, Spitamen and Mastchoh districts and in Khujand and Qurghonteppa. New capacity for processing 12,000 tonnes of cotton fibre annually has appeared in Sughd Oblast. In addition, there are 28 oil pressing factories in Sughd as well as numerous small and medium size milk production and processing centres covering almost 30% of the provincial need for milk products. According to MoA Department in Sughd, overall, over 14% of fruit and vegetable produced in the province is processed locally. For instance, almost 85% of apricot harvest is being processed for export, adding to provincial income on foreign currencies.

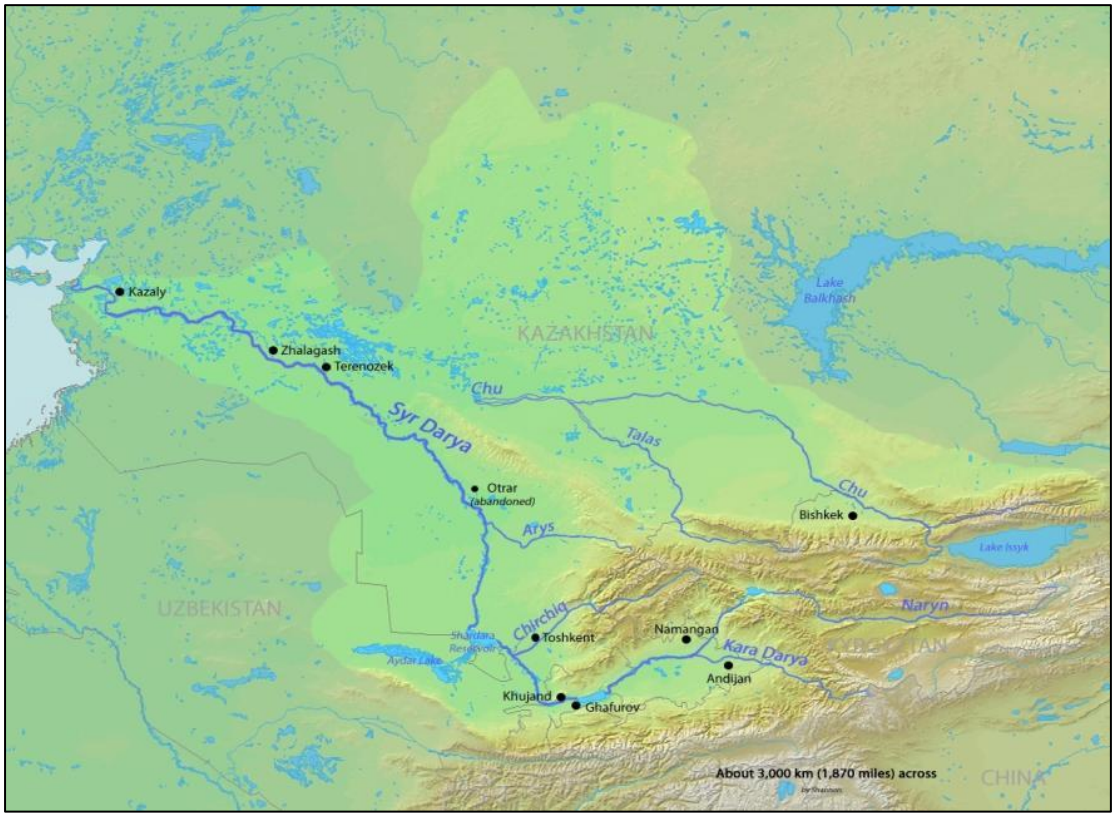
On average 60% of agriculture land (around 140,000 ha) depends on irrigation with pumping stations (Sughd Agriculture Department). In Zafarobod and Mastchoh Districts, for instance, almost 100% of agriculture land relies on pumping stations,

much of it 40-50 years old and in urgent need of rehabilitation. The main source of water in Northern districts of Sughd is the Syr Darya with its four main sub-basins, Isfara, Khoja Bakirgan, Aksu and Isfana and the Zarafshan River in the Southern districts, all originating from the Turkistan Mountain Ranges. [10]

Rural Village in Sughd

[10] South part of Zerafshan River basin originating from north flanks of Zarafshon Mountain Range

7. Syr Darya Basin



Source: Wikipedia

The Syr Darya River rises in two headstreams in the Tian Shan Mountains in Kyrgyzstan — the Naryn River and the Kara Darya—and flows for some 2,212 km east and north-east of Uzbekistan and southern Kazakhstan to the remains of the Aral Sea. The Syr Darya drains an area of over 800,000 square km, but no more than 200,000 square km actually contribute significant flow to the river. Its annual flow is very modest at 37 km^3 per year—half that of its sister river, the Amu Darya.
Along its course, the Syr Darya irrigates the most fertile cotton-growing region in the whole of Central Asia, together with the towns of Kokand, Khujand, Kyzylorda and Turkestan.

An extensive system of canals, many built in the 18th century by the Uzbek Khanate of Kokand, spans in the regions where the river flows through. Massive expansion of irrigation canals during the Soviet period, to irrigate cotton fields, has caused ecological damage to the area, with the river drying up long before reaching the Aral Sea, which, as a result, has shrunk to a small remnant of its former size. With millions of people now settled in these cotton areas and their livelihoods heavily depending on agriculture, it is not clear how the situation can be rectified.
In Tajikistan, Syr Darya is the source of water for northern districts of Sughd province with its four main sub-basins, Isfara, Isfana, Aksu and Khoja Bakirgan are the main source of irrigation water for some 200,000 – 220,000 ha land and drinking water.

Main Sub-Basins of Syr Darya

Four water reservoirs facilitate access to water in northern Sughd:

- Kairakum with a total capacity of 4,160 million m^3 of which an average of 2,600 m^3 is used regularly.
- Farhod with a total capacity of 350 million m^3 of which around 50 million m^3 is used regularly.
- Katasoy with a total capacity of 55 million m^3 of which around 33.8 million m^3 is used regularly.
- Dahanasoy with a total capacity of 42,000 $m^3$of which around 150,000 m^3 is used regularly.

The irrigation system in Syr Darya basin is served by around 1,400 km of primary and secondary canals with 935 hydraulic structures[11] and some 10,300 km of tertiary (on-farm) canals with 1,470 hydraulic structures. Additionally, 45 on-farm and 179 off-farm pump stations are delivering almost 70% of the total irrigated agriculture area with water.

Total **agriculture area** in the province is estimated at around 273,500 ha.[12] (Almost 90% in northern districts, Syr Darya Basin) of which around 265,400 ha is arable, and around 200,000-220,000 ha is under irrigation. Real figures of actual irrigated agriculture land area differ between the various state agencies in the Oblast. While Sughd Oblast Agriculture Department estimates current area under irrigation at around 175,000 ha, the department of water estimates irrigated area at around

[11] Hydraulic structures include: gates, distributors, drops, regulators, inverted siphons, etc.)
[12] Sughd Oblast Department of Agriculture, December 2012

200,000 ha, reports by non-government organisations indicate around 150,000 ha is under cultivation due to deterioration of irrigation infrastructure and weakened water resources management structures. Much of the infrastructure is on average 40 years old and with little rehabilitation and maintenance the system has been badly affected.

Water intake from Syr Darya River is regulated on the basis of the Agreement on use and protection of interstate water sources between Central Asia countries, Almaty, 18 February 1992. According to the Agreement water intake for 90% probability/year of river water flow is shown in the table below:

Water use limit with guarantee 90% (90 year during 100 year), in км^3/year		
From surface water sources		**From ground water and return water**
Total	**Including, form**	
2.46	1.81	1.20

A review of **availability, supply and demand of water resources, overall in Sughd and particularly in Syr Darya Basin,** indicate conflicting figures. Figures taken from Sughd Oblast Directorate of Water Management and from regional and international sources also show that the difference between water availability and intake differs from year to year, depending on weather conditions in a given year (amount of snowfall and precipitation).

The table below shows water availability, demand and supply in Sughd Oblast (including Zarafshan) as a whole and in Syr Darya in particular.

Annual average capacity of Syr Darya River	18.00 billion m^3
Annual Average capacity of Zarafshan River	5.20 billion m^3

Total annual capacity Sughd Oblast	23.20 billion m^3
Average annual intake in Sughd Oblast	3.66 billion m^3
- From all sources, of which irrigation consumes (almost 90% in Syr Darya Basin area)	3.17 billion m^3
Sughd Oblast Irrigation requirement	3.5 billion m^3
- of which Syr Darya Basin area requirement is	3.12 billion m^3
Syr Darya annual intake allowance according to interstate agreement of 1992	1.81 billion m^3
Ground water & national rivers	1.20 billion m^3
Actual annual delivery of irrigation water differs, depending on precipitation and snow fall & the state of infrastructure	1.30-3.00 billion m^3
In 2012, for instance, just over 2.00 billion m^3 irrigation water was delivered[13]	

[13] Sughd Oblast Directorate of Water Management (Oblvodkhoz), 2012 data published in March 2013

Main crops include cereals over 118,114 ha, including wheat (44,450 ha), maize, rice and other cereals. [14] Cotton cultivation covers an area of 61,170 ha, followed by potato with 15,000 ha, vegetables with 13,600 ha and orchards and vineyards covering around 52,000 ha.

Pastures cover some 786,300 ha, of which over 96,000 ha is considered winter pasture, 404,000 ha summer pasture, almost 280,000 ha spring and autumn pasture and an area of all-year pasture of around 6,500 ha. Of the total pasture area, only around 750 ha is irrigated according to the Oblast Agriculture Department.

Spring potato cultivation in Rozrovut

Similar to other parts of Tajikistan, livestock has more than doubled since it was privatised in 1990s while fodder production has reached its lowest level. As of 2012, there are around 564,600 cattle, of which cow make up 298,400; 1.3 million sheep and goat and 1.365 million poultry. Compared to the numbers of livestock, especially cattle and small ruminants, fodder production in the province is insignificant at around 291,500 tonnes, made up of alfalfa, fresh grass, hey and leftovers from cottonseed after oil pressing. Annually, almost 34,000 tonnes meat (livestock and poultry), 220,000 tonnes milk, almost 93 million eggs, 1,240 tonnes raw wool, 1,200 tonnes honey and 620 tonnes silkworms are produced in the Oblast. [15]

7.1. Situation Analysis – Syr Darya Basin

The Syr Darya is the main source of water for the Fergana Valley. The Valley is also rich in ground water. However, since the collapse of the Soviet Union, the Valley's irrigation and drainage systems have fallen into disrepair. Subsequently, disruption in the supply of irrigation water and increased underground water table leading to water logging and continued salination has caused severe loss of soil fertility and has reduced crop yields. According to reports from Sughd Oblvodkhoz, some 20,000 ha arable land around the Syr Darya basin is out of cultivation due to underground high water table. However, unofficial estimates put these figures much higher. Similarly a visible reduction in the total irrigated area - caused by water logging and salinity - has had clear impact on the total agriculture output.

[14] Sughd Department of Agriculture et al
[15] Sughd Oblast Department of Agriculture, 2012

The Kairakum Dam and Reservoir directly located on the Syr Darya upstream and east of Khujand, is the most important water system control in northern part of the Sughd Oblast. The dam operates primarily to manage release of water for irrigation to downstream agricultural areas in Tajikistan, Uzbekistan and Kazakhstan and for hydropower generation in Tajikistan. The Valley lands to the north and south are supplied with irrigation water from the reservoir and the river itself through an extensive network of pumping stations as well as from two large irrigation contours. Following paragraphs illustrate analysis of the current situation.

1. **Infrastructure:** Over 70% of the agricultural land of Tajikistan along the Syr Darya is irrigated by pump stations, some pumping water from the rivers into three parallel canals, such as Khoja Bakirgan pumping station No. 1 with a capacity of 270,000,000 cubic meters annually, of which over 28,000,000 cubic meters is delivered for adjacent agriculture land in Kyrgyzstan. In case of Zafarobod and Mastchoh districts, for instance, pump stations irrigate 100% of agricultural land. Almost all pumping stations are 40-50 years old and, many have worn out and lack of regular maintenance and repair continues to deteriorate the situation.

   Even though the Asian Development Bank (since 2003) and the World Bank (since 2005) have invested significant financial resources to rehabilitate the pumping stations and their infrastructure, much of the infrastructure has continued to deteriorate and require urgent rehabilitation and in some cases renovation. Of the 1,400 km of primary and secondary canals around 30% requires urgent rehabilitation to prevent continued water losses along the canals. Similarly, much of the over 10,000 km on-farm canals are dug in mud/earth without lining that results in significant loss of water, especially in downstream areas.

Dysfunctional secondary canal gate in Spitamen

Total loss of water from primary canal to farms is estimated around 20-30%, due partly to stony ground but also concrete lining. However, physical observation by the mission indicate that at around 20-30% of the water is lost in the on-farm canals alone and require urgent attention. Taking into account the losses at both levels, it is estimated that around 30-40% of the water is lost during transfer from the main source to the plots.
Regular cleaning of the canals is, therefore, critical to reduce water losses. However, lack of access to machinery makes it impossible for most farmers and Water User Associations (WUAs) as well as for Oblast and Rayon water authorities to regularly clean up the canals.

There are only few water reservoirs on the Tajik side of the Syr Darya; the major ones are Kairakum, Katasoy, Farhod and Dahanasoy. In case of Aksu river, which provides some of the water for Spitamen (also to Kyrgyzstan), the river flows directly into Shavkat Canal. Absence of reservoir and headwork (intake gate) does not allow the authorities to preserve much of the rain, flood and winter water while flash floods often cause severe damage, not only, to the dam constructed of mud and gravel but also to the canal and the rest of the infrastructure, especially as much of the canals are built on the river.

Technical specialists and officials of the water department in Sughd estimate the cost of rehabilitation for the main structures of the entire Syr Darya at around US$ 80 million, beyond the financial capacity of the Government of Tajikistan and any single donor agency. The cost for Khoja Bakirgan and Aksu sub-basins alone is estimated at around US$ 26 million. Therefore, future projects should consider a combination of both soft and hardware, as without rehabilitation the situation is unlikely to change.

2. **Infrastructure Inventory and Water Information System (WIS):** Similar to agricultural sector, it is difficult to obtain accurate figures on the state of infrastructure in Sughd, as figures by the various departments are conflicting. Over the past 10 years, several international organisations and donor agencies have invested valuable resources to improve the water sector along the Syr Darya. Huge amount of data has been collected to effectively analyse the situation prior to any intervention. However, much of this data lies around without an appropriate system to effectively restore, analyse and maximize their use. In brief, Tajikistan clearly lacks an efficient national WIS and the Ministry of Land Reclamation and Water Resources (MLRWR) at national and provincial level. Therefore, future projects should consider a systematic approach to WIS as one of their urgent priorities to help understand the situation better. A viable WIS would also allow authorities to negotiate with their neighbours more effectively and based on accurate data.

   Similarly, there is no appropriate inventory of the infrastructure, neither on-farm nor off-farm that would allow the water authorities to analyse the need

for rehabilitation and in case of transfer of infrastructure to water users, for instance, especially the tertiary/on-farm infrastructure. The United Nations Development Programme (UNDP) has created an inventory model, piloted in Isfara sub-basin but the model needs additional work to be completed as an appropriate tool for the rest of the country. Therefore, completion of a viable asset inventory system would enable water authorities to have a clear picture of available assets and their condition before such assets are transferred to the future institutions – Basin Authority, MIROB and WUAs.

3. **Water Delivery and Water Use Efficiency:** According to available data, water use efficiency in Sughd Oblast as a whole and in Syr Darya basin in particular is higher partly due to the fact that much of the canals from source to the farm (primary and secondary) are foreseen with concrete lining. However, the losses on the farms are significantly higher because much of the on-farm canals are not lined with concrete and absence of regular cleaning is a major concern. Subsequently, the conclusive water efficiency in Sughd ranges between 0.45 and 0.60 or at an average of 0.53.

   Access to irrigation water, however, differs much on the location and the source of water. According to Oblast water authorities, water delivery is estimated at 70% of the requirements, while farmers estimated access to irrigation water at 50-60%, depending on their location as well as the state of the infrastructure. Taking an average figure between water authorities and farmers, one could conclude average access to irrigation water at around 65% of the requirements.

Aksu River flowing through Canal in Spitamen without gate

Most farmers visited during the mission complained about irregular water supply, especially during the spring months when access to water is crucial. Many farmers and WUAs reported that due to its national and provincial importance priority is given to cotton fields thus disadvantaging other crops, especially cereals, potato, fodder and fruits and vegetable and subsequently putting food security at risk.

4. **Agriculture Pattern:** Despite numerous laws and resolutions of the Government of Tajikistan over the past few years, notably the Resolution No.

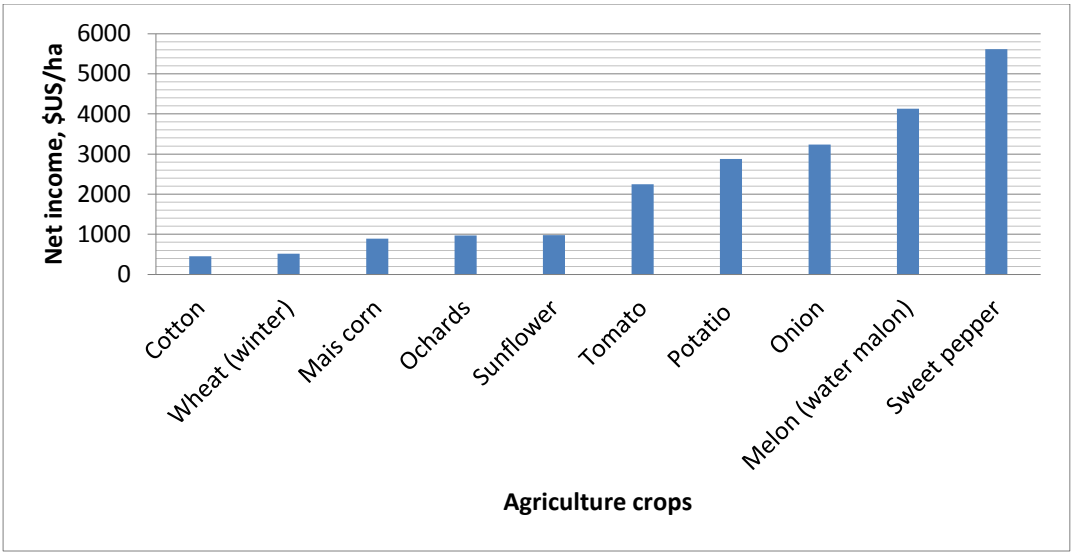
111 on “Freedom to Farm” from 2008, the newly approved Land Code from August 2012 providing for land lease to be lifelong, transferable, tradable and exchangeable, the land restructuring process and the ongoing Agrarian Reform of the Government of Tajikistan, agriculture pattern in Sughd has not changed much.

Cotton continues to dominate agriculture production with 50-60% of the total arable and irrigated area and with growing number of cotton ginneries and fibre production industry there is huge pressure on farmers to produce cotton. Some farmers interviewed during the mission stated that failure to cultivate cotton could easily lead to loss of access to land. Local authorities estimate cotton-growing areas at around 50% but farmers in some areas reported that pressure by some local authorities makes them use more than 60% of their land for cotton.

Discussions with technical specialists indicate that while raw cotton and fibre export is crucial to secure the badly needed foreign currency, farmers however, benefit little from cotton. Several farms visited during the mission reported cotton debt of up to US$ 100,000 and stated that at the end of the season all they earn goes to investors and futurists. In some cases, especially in years with unfavourable weather conditions and/or absence of sufficient water (less snow and rain and limited access to irrigation water), they can’t even afford to cover their costs; debts continue to mount year after year. 80% of the cotton harvest is delivered to the factories raw and un-cleaned and as a result farmers lose the seeds that could provide badly needed cooking oil as well as the remains that offer very good fodder for livestock.

Several researches at regional and national levels show that farmers are much better off when growing cereals, potato, fruit and vegetable than cotton. Onion, maize, potato, tomatoes and similar crops offer a net income 2-3 times that of cotton. Therefore, it is crucial to allow farmers to decide what to grow and where to market their products, in line with Resolution No. 111 of the Government of the Republic of Tajikistan.

Table below shows actual cost-benefit analysis of some crops in Sughd. (Source: Irrigation-Agriculture Consulting (IAC)



Participants of the Stakeholder Roundtables in Khujand and Dushanbe strongly requested the introduction of appropriate farming technologies where efficient use and management of land and water on the farms could be demonstrated. Two local NGOs have been engaged in introduction of such technologies as part of SDC's previous IWRM with some concrete results and the mission believes such measures will have immense impact in improving farm productivity while saving the precious water resources.

Despite serious efforts by the Government, full implementation of the land reform still remains a challenge in the province. According to some officials, provincial experts and farmers, some 30-40% of the former Kolkhozes and Sovkhozes have not been restructured yet. Many have been simply renamed into "Agriculture Cooperatives" and associations but operate exactly as their predecessors (Kolkhozes and Sovkhozes), even though they have been divided into somewhat smaller farms, in form of "Brigades" with 50-200 ha per brigade.

View of a village in Spitamen

Some farmers reported that they continue to lease land from the farm managers, even though they are officially listed as shareholders in the farm certificate. Several villages visited reported that the lease is based on sharecropping and farmers are required to deliver on average 50% of their harvest to the farm manager, pay for the water cost, taxes and all additional expenses.

5. **Water Debt:** Like other parts of Tajikistan, the water debt keeps growing in Sughd Oblast and water authorities have not yet managed to find a viable and appropriate solution. As of 2012, the MLRWR reported the water debt at around TJS 300 million (US$ 60 million) and this figure might as well be on the rise for 2013. Discussions with water authorities, WUAs and farmers conclude that with the current situation and considering the agriculture pattern as well as the state of the farms, the water debt requires a thorough assessment if it is to be addressed effectively. While most farmers would not be in the position to repay the debts, the water debt could be used as an incentive for the implementation of the planned water sector reforms.

   Existing WUAs do not have the capacity to effectively collect water fees and local water authorities feel obliged to continue delivering water so as to prevent crop failures that would have devastating consequences. Yet some authorities and most WUAs and farmers interviewed reported that much of the water debt is related to cotton farms. While some larger (cotton) farms refuse to pay for the water, other smaller farms are deeply indebted to investors and futurists and cannot afford to pay for the water. In contrary, where land reform has taken place and farmers have been allowed to grow what they believe is best for them and for the market water payment is significantly higher.

   Individual farms reported water debts running into TJS thousands. One single WUA in Spitamen, for instance, owes a total of TJS 100,000 (US$ 20,000) to the water authorities. In one district the head of the water department reported that as of 2012 the water debt runs into TJS 16 million (over US$ 3 million), mostly owed by cotton farms. In 2012, water authorities delivered 5.67 million cubic meter water and only 3.9 million cubic meters was paid for.

6. **Water Institutions:** The water departments at Oblast and Rayon levels are under double-sub-ordination. They report to both the provincial authorities and to the MLRWR. The Oblast water department is responsible for the regulation and management of the water resources, while Rayon water departments are responsible for the operation and delivery of the water.

There are over 100 WUAs in Sughd Oblast16, of which around 35 have been created by international organisations (in Konibodom by World Bank, in Khoja Bakirgan by Swiss Agency for Development and Cooperation, in Isfara and Konibodom by UNDP,and in Zafarobod by ACTED and a smaller Australian NGO) and the rest by the branch of the Sughd Water User Associations Department.

However, discussions with both WUAs and farmers confirm that none of these WUAs have the full capacity to operate and manage the water system at the on-farm level nor can they ensure systematic collection of water fees, except in a few cases. WUA representatives and local authorities alike have reported that much of the effort by international agencies and local government institution has been concentrating on ad hoc training, seminars and some equipment. Absence of financial resources and lack of access to machinery makes it impossible for the WUAs to regularly clean up the canals and maintain the infrastructure. In some cases, equipment has been delivered but mainly computers and some office furniture, while most lack even basic office facility and premises.

Even though water authorities consider the on-farm infrastructure maintenance to be the responsibility of WUAs, those infrastructures have not yet been legally transferred to the balance of the WUAs. Therefore, an appropriate inventory system for the infrastructure becomes vital if the on-farm infrastructure is to be transferred to WUAs. As of April 2013, the MLRWR reports that some 700 deep wells have been transferred to the farmers. Therefore, transfer of these assets to WUAs is critical in order to efficiently maintain and rehabilitate them.
Most WUAs visited reported that farmers couldn't even afford to pay their minimum membership fees, set at an average of TJS 20-30 (US$ 4-6)/ha/year, let alone paying for the water fees. Several leaders of WUAs interviewed reported they were working on voluntary basis and in a few cases they get paid in kind. Much of the cleaning work is undertaken only when farmers have the resources to pay for the costs and willing to participate in Communal work (Hashar). Two small farms of 80-100 hectare reported that annual cleaning costs run into TJS 50,000-60,000 (US$ 10,000-12,000) plus labour time.

In brief, the current stage of the WUAs can in no way be considered effective and efficient and require urgent attention in systematic training, capacity building and institution development. However, without support to badly needed basic machinery and rehabilitation of the infrastructure much of the capacity building and institution development will remain ineffective. In one farm, farmers had spent a one-off financial resource in lining up the on-farm canals with stones from the rivers locally available. All they had to bring from

[16] Sughd Oblvodkhoz WUA Support Unit data for April 2013 reports that from 109 WUAs only 88 have some functioning and the rest remains on paper only though they have been legally registered.

outside was some technical expertise, cement and small machinery for the initial cleaning before lining. This shows that with good leadership and sustained support WUAs are capable to address farmers' problems more effectively.

7. **The State of Watersheds and Water Related Disaster risks:** According to minimal estimation by the Committee of Emergency Situations, in Sughd province, natural disasters caused over TJS 300 million (US$ 60 million) of direct damage in 1998 – 2012.[17] Mudflow (40%), torrential rains (28%) and extreme weathers (9%) are among major disasters.[18] Another major concern in Sughd is the uranium tailing disposals of the Soviet era in Taboshar and Deh Moy settlements. According to a research by the International Atomic Energy Agency (IAEA) in 2009, the deposits entail some 10 million tonnes of acidic uranium tailing buried under 61.5 ha of land, covered by a thin layer of soil. Surface radiation from these tailings has recently been measured between 40 and 500 micro roentgens per hour, compared with internationally accepted norm of 15-20 micro roentgens per hour. Experts fear rising water table and continued water logging may eventually lead to spillover of nuclear waste into the Syr Darya with disastrous consequences. Reliable reports indicate that negotiations between the Government of Tajikistan and its development partners, particularly the European Union in 2012 have already resulted in some financing to address this issue more comprehensively. Under the European Union Instrument for Nuclear Safety Cooperation, two programmes have been agreed: 1) Specific risk mitigation actions in Taboshar where some signs of water contamination is already visible; and 2) Environmental Impact studies and Feasibility Studies for the remediation of the uranium legacy sites in Deh Moy and Taboshar.

   The four sub-basins of the Syr Darya, under the feasibility study (on the Tajik side) are mostly located in flat areas, except for parts of Aksu and Isfara, covered with a huge network of irrigation canals and infrastructure. These are regularly affected by severe mud and debris flow that originate in the upper transfer zones of the watershed in Kyrgyzstan. Much of the damage is caused by intensive seasonal precipitation and rapid melt of the snow pack in upstream zone, further enforced and amplified by severe land degradation, intense irrigation and poor agriculture practices, coupled with overgrazing and disappearance of almost the entire forestry in the region.

   Continued lack of maintenance of rivers, creeks and irrigation channels continue reducing the water flow and therewith the capacity to carry sediments. Erosion is on the rise in all four sub-basins, especially in Khoja Bakirgan and Aksu, leading to further destruction of embankments and riverbed degradation. Water absorption capacity in the watersheds is

[17] The amount includes only cost of the assets lost (destroyed or damaged) and does not consider the replacement costs (response and recovery)
[18] Committee on Emergency Situation, Sughd, 2012,

decreasing considerably due to continued deterioration and poor conditions, resulting in peak runoff and surface erosion increases. Continued population and livestock growth, coupled with deteriorating agricultural conditions have led to continued increase in encroachment of the watercourses, both upstream and downstream. There is no warning system in place and as a result people's lives and livelihoods continue to be at risk. Of the four sub-basins visited, Aksu watershed perhaps presents the most affected one and requires urgent attention. Yet, it has to be noted that though Aksu originates in Tajikistan it passes through Kyrgyzstan for about a third of its total length before it enters Tajikistan again. Therefore, viable synergies between Tajikistan and Kyrgyzstan would be an important pre-condition for any intervention.

8. **Restructuring and Reforming the Water Sector:** Considering the facts stated above, both the MLRWR in Dushanbe, Oblast and Rayon water authorities as well as other relevant provincial authorities believe the water sector reform and restructuring is no longer an option but an obligation. Based on principles of Integrated Water Resources Management (IWRM), introduction of river basin management and separation of policy/regulation from operation seems to be the only option in addressing the water sector issues with a long-term perspective.

   The MLRWR has been working for the past three years to develop a water sector reform strategy, as part of the ongoing Agrarian Reform process of the Government of Tajikistan and it is envisaged that a final decision would be taken in the next few months. While the implementation of the reform nation-wide may not be desirable at this moment, international organisations and the state must support the MLRWR in at least piloting the reform agenda. As such, the Syr Darya basin offers an excellent opportunity for the pilot, given the willingness of both national and local authorities and the intensive support that several development partners have provided in the oblast over the past 10 years – both rehabilitation and institutional support.

   However, it must be noted that reform implementation will not bear the desired outcomes unless it is accompanied with practical support to rehabilitation, some renovation and mechanisation of the water sector and its infrastructure.

9. **Policy Dialogue and Effective Coordination:** There is an excellent level of policy dialogue and coordination at national level, where key development partners and government agencies meet regularly and discuss issues and agree on how to address them jointly. The Agrarian Reform process at central level has offered an excellent opportunity for this dialogue and efforts must be made to maintain the level of dialogue.

   However, the process of dialogue and policy development at national level has not yet fully triggered down to the provincial and far less to the local

(district) level. Many of the local authorities are unaware of the ongoing policy dialogue related to the Agrarian Reform. Therefore, it is crucial to develop a mechanism that would allow for regular dissemination of national level policy dialogue to oblast and rayon levels. One way to do this would be the establishment and development of a provincial policy dialogue platform that would regularly reflect national level policies and strategies, and where Oblast and Rayon authorities can regularly meet with their relevant development partners and discuss and agree on how those national policies and strategies could be implemented at provincial and local level.

Though some coordination is in place among development partners at the provincial and regional level (latter relates to a whole series of transboundary water projects), this is still in its initial stage and must be developed further. The coordination should, however, go far beyond the development partners and actively engage provincial and district authorities. Most authorities reported this lack of coordinated effort as a weakness and stated that future programmes would immensely benefit from a joint coordination mechanism between development partners and provincial and district authorities. Concerning water issues, the best way forward for effective coordination would be through the establishment of the Syr Darya Basin Authority and its Basin Council, allowing also representatives of the water users and civil society to actively participate and have their voice heard.

10. **Selecting Sub-basin(s) for Collaboration Across the Border:** Support to reform implementation and large-scale rehabilitation and renovation of infrastructure would be beyond the capacity of any single organization and/or the government. Therefore, future programmes may want to concentrate on one or two select areas (sub-basins) where practical physical intervention would be urgently required based on a select set of criteria. This way, both the government and the farming communities would practically see the benefits of the reform but also of the interventions by development partners, rather than spreading across a wider area with no visible and concrete result. With increased capacities and enhanced institutions on both sides of the sub-basins, cross border collaboration, coordination and cooperation would be enhanced as well. Effectiveness and efficiency of more concentrated and extensive support to 1-2 sub-basins should take into consideration the coordination with other actors engaged in the region

    Three development partners are engaged extensively in Isfara sub-basin, including: 1) the World Bank with its extensive support to rehabilitation activities in the left embankment of the Kairakum Reservoir and more specifically in Konibodom and Bobojon Ghafurov Districts, including support to establishment of 3 WUAs. 2) UNDP has been engaged in Isfara sub-basin and has established 6 WUAs between Isfara and Konibodom and has begun among other activities, developing an Asset Inventory system that requires some additional work to be finalised. Colleagues from UNDP also reported that they are currently seeking additional funding to continue work in Isfara.

3) GIZ has selected Isfara sub-basin for its ongoing Transboundary Water Management in Central Asia Program with the aim to support water authorities of Tajikistan and Kyrgyzstan enhance coordination and cooperation on specific rivers and sub-basins. Other activities envisaged by GIZ include capacity building and institutional development.

SDC has provided extensive support to Khoja Bakirgan over 8 years, as part of its previous Fergana Valley IWRM Project, including canal automation, support to 16 WUAs along the Khoja Bakirgan Canal and similar activities. Its biggest achievement has been the creation of the Khoja Bakirgan Canal, applying true IWRM principles. Most people met during the mission confirmed that Khoja Bakirgan Canal is the only sub-basin along Syr Darya with appropriate basin approaches.

Dahanasoy Water Reservoir – Ghonchi District

Aksu River has received very little attention over the past few years, especially as it is not considered a major sub-basin and would represent an excellent opportunity for cross-border cooperation (both Khoja Bakirgan and Aksu are transboundary sub-basins between Tajikistan and Kyrgyzstan). Aksu would also offer an excellent opportunity for a model watershed management cum disaster risk reduction.

8. Major Issues to be Addressed

Considering the statement of issues listed in the situation analysis, major issues to be addressed in Syr Darya future projects include, among others:

- The **infrastructure** across the Syr Darya basin and its sub-basins (Isfara, Isfana, Khoja Bakirgan, Aksu, Katasoy-Basmanda and Asht-Samghor soys) and the separate irrigation schemes in Mastchoh, Zafarobod, Samghor and Kizil continue to deteriorate and require urgent attention. Rehabilitation of the infrastructure from intake canals to pump stations and on-farm canals must be addressed urgently.
- In order for the rehabilitation to be undertaken effectively and efficiently, completion of the **inventory mechanism** is a pre-condition both for national and provincial (future basin authorities) to understand what assets are available and in what state they are. This should automatically lead to the establishment of an appropriate and affordable **national water information system** that would allow water authorities to take informed decisions, both at national level and in negotiations on transboundary issues.
- **Water delivery and water use efficiency** is largely affected by the deteriorating infrastructure and must be addressed through a systematic approach – appropriate operation and management systems as well as timely/regular maintenance and cleaning of the system - that would enable efficient use and management of the scarce water resources.
- Current **agriculture pattern** must be changed allowing farmers access to badly needed services to improve production and productivity based on principles of market demand and supply. Innovative approaches must be adapted to support farmers maximizing the use of their available resources, especially land and water. Efficient and effective land and water use requires an **integrated approach to natural resources management and use**. Furthermore, **completion** of the **land reform** and full implementation of the Government of Tajikistan's **Resolution #111 on "Freedom to Farm"** must be accompanied by affordable access to agriculture finance and credit to enable the agriculture sector to become more productive and profitable.
- While the current **water debt** can only be addressed by the Government of Tajikistan, future programmes must ensure farmers have the ability and capacity to pay for water, while water delivery service institutions must be fully equipped to deliver water on time and with required quality and quantity. Enhanced role of WUAs and their ability to effectively address water delivery as well as efficient maintenance and operation of the infrastructure is only one of the many options.
- There is no **clear division of roles and responsibilities between water-related institutions** causing confusions and misunderstandings among all stakeholders, from national to oblast and from rayon to WUAs. Therefore, while the implementation of the water sector reform would automatically address major issues in this regard, future programmes must ensure stakeholders have a good understanding of their roles and responsibilities.

Therefore, **public awareness, advocacy** and allowing stakeholders in timely **access to national policies and strategies, legal issues as well as government regulations and resolutions** would be vital for all stakeholders to clearly understand their roles and responsibilities, while supporting them effectively in the implementation process. In relation to water users, for instance, clear definition of relationship between farmers and WUAs, between WUAs and Rayvodkhoz (future MIROBs), Rayvodkhoz and Oblvodkhoz (future Basin Authority) and further Oblvodkhoz and MLRWR (Future Ministry of Integrated Water Resources Management) would be crucial.

- Application of **sustainable natural resources management,** especially land and water, approaches should become integrated part of any future project that would help improve the watersheds and reduce water-related disaster risks. In order to protect, preserve and sustainably maintain the water resources an **integrated watershed management** approach that would address the watershed issues right from the source to the farm would be crucial. Such an approach would allow to address issues related to flooding, mudflows and similar issues in an integrated manner, including forestry and pasture as well as early warning systems supported by physical intervention along the rivers to prevent damage from floods would be some of the elements. Exploring alternative energy sources and offering communities with appropriate skills and technology to divert their energy source would prevent further destruction of forests. Similarly, effective and efficient pasture management technologies, coupled with livestock growth control and increased fodder production would reduce the damage and make livestock sector more productive and profitable.
- As mentioned above, both national and provincial authorities but also water users and provincial specialists believe that the **water sector reform implementation is no longer an option but an obligation**, considering the state of the water resources and its multiple challenges, including institutional and management challenges. However, to facilitate the implementation of the reform in Syr Darya, a clear political decision at national level is required. The MLRWR has agreed that the reforms are necessary and a formal approval by the Government of Tajikistan and the Parliament is expected in the next few months.
- The implementation/piloting of the water sector reform in Syr Darya Basin would inevitably be a challenge both for the Government of Tajikistan at national and provincial levels but also for its development partners. Therefore, establishment and development of a **viable policy dialogue mechanism at provincial level as well as an effective coordination mechanism** at basin level would allow provincial authorities and development partners to agree on common issues and how existing and planned projects and programmes could assist in addressing common issues and provide sustained support to the reform implementation.

9. Key Priorities

Considering the statement of major issues to be addressed and following Stakeholder Roundtable Workshops in Khujand and Dushanbe, key priorities for future intervention would include:

1. **Support to the Water Sector Reform Pilot in Syr Darya Basin:** Provide extensive support, as far as financial resources allow, to enable the MLRWR and provincial authorities to effectively pilot the water sector reform in Syr Darya Basin. The reform pilot would entail separation of policy/regulation from management/operation. In other words, the establishment of Basin Authority for regulation and management of the resources and of MIROB as service delivery and operation and management (O&M) agency would be part of the initial stage. To do this effectively, future programmes must commit themselves for a long-term intervention. Furthermore, future programmes should create a common platform with other international stakeholders to ensure effective coordination and avoid any possible duplication of efforts and thus avoid waste of scarce financial and human resources.

2. **Support to Rehabilitation and Mechanisation of the Water Sector Infrastructure:** As mentioned above, the implementation of the water sector reform would only then be effective and efficient if issues related to rehabilitation are also addressed. Therefore, the water sector reform pilot must go hand-in-hand with some rehabilitation and mechanisation, both at primary and secondary levels and on-farm infrastructure. Considering past experience in Khoja Bakirgan sub-basin – the only officially recognized basin in Tajikistan so far (Khoja Bakirgan Canal) – and the urgent attention required in Aksu sub-basin as well as the role of other development partners in other sub-basins, it is recommended that future programmes support some rehabilitation both at primary and secondary canals but also at farm level in these two sub-basins. These may include, among others, provision of some machinery for the would-be established new water authorities as well as for the WUAs to enable them to regularly clean and maintain the infrastructure.

3. **Support to WUAs and Automation and Water Measurement Systems:** Several international agencies have already undertaken much needed work in relation to WUA development in Syr Darya. However, these WUAs have not yet developed themselves as efficient and effective institutions and would require extensive support in the future programmes to become self-reliant and sustainable institutions. With extensive experience in Khoja Bakirgan, for instance, establishment and development of WUAs would greatly benefit the water sector in Aksu sub-basin too and should be considered as priority in the future programmes. The SDC IWRM project over the past 8-9 years has provided some support to the automation system in Khoja Bakirgan. However, the system has reached

only halfway (of the 49.8 km of the Khoja Bakirgan Canal Management serving the Tajik side, only 22 km has been automated) and needs to be completed. In addition, the future programme must also address issues related to electricity supply so as not to allow for interruption of the data storing and processing and build further capacities for the operators to also understand and re-programme the system in case power supply and/or technical problems that might occur and cause disruption in the system. Finally, considering the limited costs involved in automation, it is strongly recommended to replicate the system in Aksu sub-basin too. Provision of water measurement equipment would facilitate improved water delivery and accountability among service delivery organisations and would enhance farmers' understanding of the water use efficiency.

4. **Support to Water Information System (WIS):** A single source of WIS would support the water sector stakeholders to clearly define ownership and responsibilities for system maintenance and operation by establishing an inventory of irrigation and drainage system. Furthermore, the system should be supported through a land and water cadastre and permitting system would enable long-term water rights to be secured. An integrated system would also facilitate efficient water resources planning and management and engagement in transboundary dialogue. Synergies should be sought with the new World Bank implemented PAMP II and experiences from previous SDC funded IWRM for Fergana Valley as well as with other key agencies, such as GIZ and UNDP.

5. **Support to Capacity Building and Institution Development:** New institutions of the future basin authorities, agencies involved in rehabilitation as well as WUAs and provincial and national water institutions – basin authority, MIROB and other organisations as part of the water sector reform process – would require systematic and comprehensive approach to capacity building and institutional development. Similarly, development of appropriate legislative framework for the reform and its related institutions would be top priority for future programmes. Therefore, it is strongly recommended that the future programme allocates part of the financial resources for this purpose and ensures all stakeholders benefit equally from this component over the next few years thus ensuring their sustainability. This component must also be effectively coordinated with national and provincial authorities and with other development partners engaged in the Syr Draya Basin.

6. **Support to Improved Watershed and Disaster Risk Reduction:** One of the most urgent areas for attention is perhaps the main water intake of Shavkat canal on Aksu River (Ghonchi District), with potential for increased water resources and improved watershed. However, as the river originates in Tajikistan (upstream) but then runs through the Kyrgyz territory for about 22 km before it enters Tajik territory again, DRR and watershed approaches must entail a coordinated effort on both sides of

the border. Perhaps sustained efforts on upstream zone on Tajik side would offer incentives for transfer zone in Kyrgyzstan to undertake similar measures.
Furthermore, applying integrated approaches - small to medium water catchments and reservoirs, reforestation, pasture management and reinforcement of river banks as well as exploring options for alternative energy sources - along the Aksu basin from the source in Rozrovut to Ghonchi would offer an excellent model for the rest of the basin, provided such an approach is applied in Tajikistan and Kyrgyzstan parallel.

Early warning and improved weather forecasting are other critical elements for effective disaster management in the focus area that would help mitigate the risk of extreme weather events, such as intense precipitation, low temperatures and drought conditions. Synergies should be sought with the on-going Pilot Project for Climate Resilience in cooperation with the Committee for Environment and Hydromet as well as with the World Bank Kairakum Early warning System.

7. **Support to Effective Policy Dialogue and Coordination:** Currently several development partners are engaged in the water sector in Sughd, most aiming to promote IWRM that requires an inclusive policy dialogue platform. Considering increased interest by development partners in Syr Darya Basin, it is strongly recommended to establish a mechanism at provincial (or rather basin) level. Following successful policy dialogue experience at national level Development partners would greatly benefit from a similar process at basin level, making use of the future basin authority office and the establishment of a basin council. Synergies would be required with ongoing mechanisms at national level, such as the ongoing Agrarian Reform process and the National Policy Dialogue process (NPD) funded by the EU and implemented by the UNECE. With regards to transboundary waters, some work has started already and more efforts would be required to enhance current processes and further support the government to effectively handle transboundary water issues.

   Last but not least, the coordination mechanism at basin level must also include other relevant Tajik Government agencies, such as agriculture, land, emergency committee and environment, representatives of WUAs and any other relevant agency that might be considered important for the purpose.

10. Lessons Learned from Previous Initiatives

10.1. Lessons Learned from Previous Projects and Perspectives

Improvement in Water Demand and Supply: Khoja Bakirgan River, with the length of some 120 km originates in Kyrgyzstan with only around 40 km within the Tajik territory, feeding the Khoja Bakirgan Canal with a length of 49.8 km inside Tajikistan. In Kyrgyzstan, some 5000-6000 ha arable land is irrigated from Khoja Bakirgan while in Tajikistan it provides irrigation water to around 14,000 ha in Bobojon Ghafurov and Jabbor Rasulov Districts. According to a Soviet era agreement, reconfirmed during high-level meeting between the two countries, 79% of the water sources have been allocated to Tajikistan and 21% to Kyrgyzstan, though current use by the Kyrgyz side is perhaps around 40%.

Previous SDC Fergana IWRM project concentrated its efforts mainly on Khoja Bakirgan Canal on the Tajik side. According to the national Focal Point for the project much of the work during phases 1-3 concentrated on organisation of institutions, the Canal Directorate that unlike Oblvodkhoz and Rayvodkhoz reports directly to the MLRWR and its office is based in a neutral location in Chkalovsk Town between Bobojon Ghafurov and Jabbor Rasulov Districts. Only during phase 4 and the final stage, the project did manage to provide small grants to farmers and WUAs plus some water measurement equipment but it failed to address the serious need for rehabilitation of the infrastructure.

One of the biggest achievements of the previous Fergana IWRM project perhaps is the creation of the first sub-basin management in Syr Darya Basin, the Khoja Bakirgan Canal, with its transboundary characteristic. The previous project implementers had requested this to be the case and provincial water authorities and leadership have positively responded to this demand.

The project did not make any significant contribution to improved water supply. Meetings with Canal authorities, WUAs as well as farmers confirmed that there has not been any major change in the delivery and supply of water, especially considering complete absence of any support to improve the infrastructure – both at primary and secondary and at tertiary levels. Yet, discussion with one WUA in

Ghulakandoz Jamoat with 160 Dehkan Farms and 5,600 members and some 40,000 population, stated flume meters provided by the project have helped the WUA and the farmers undertake more accurate water accounting practices. As a result, fee collection has been improved, especially as WUA has created Mahalla Mirobs (Chiefs of Water) who regularly measure the water delivered to the farms, based on a contract and ensures fees are paid in time. In 2012 for instance, the WUA managed to collect TJS 110,000 (US$ 22,000) for TJS 130,000 (US$ 26,000) delivered water. Subsequently, in WUAs with more substantial support, there is evidence that water efficiency has been increased and as a result water demand has been reduced by 15-20%.

However, WUA Committee members also mentioned that without improvement in infrastructure and access to appropriate machinery their work might be undermined in longer-term, especially considering that the infrastructure of the canal as well as the pumping stations are 50-60 years old and have been badly maintained and repaired and some are falling apart. In contrary, another WUA in Rahimjon Ahmadjonov Jamoat (Obi Ravoni Obchi Kalacha-WUA) reported serious difficulties in collecting even membership fees from member farmers, let alone the ability to regularly collect water fees. This WUA has not received any water meters, nor any machinery and other facilities that would facilitate regular cleaning and maintenance. Much of the cleaning is undertaken by voluntary communal work (*Hashar)* and members pay for the rent of machinery.

According to latest project reports, the previous project has equipped 6 out of 16 WUAs with flume water meters. Yet, the SDC management believes that even achievements among a small group of WUAs has not gone far enough: "…*However, the project has also shown that the effect of water flume meters could be more profound and impact of the efficient water use on water productivity can only be sufficiently monitored if the water flow devices are combined with gates and a WUA is fully equipped as opposed to a sporadic construction of the structures at few points only."*[19]

Overall, one could conclude that **there is no relation between demand and supply,** a weakness inherited from the Soviet era that continues to dominate water management in Tajikistan. Farmers are at the mercy of climate (precipitation, snow and general weather conditions) and of the availability of water from irrigation sources. Even though, compared to other parts of Tajikistan, water delivery in Sughd is higher, estimated at around 65% of the requirements, one WUA Council Chief when asked about top priorities for the future programme, mentioned only one priority: ***"…as long as authorities ensure on-time water supply – that is water delivery when we need it most – we will manage the rest…"*** Therefore, the future water management system must be demand-driven rather than supply-oriented.

The previous SDC-funded Fergana IWRM also established Water Committees as part of their effort to enhance communication and dialogue between state authorities

[19] Fact Sheet, Central Asia: Water Productivity Improvement at Plot Level, 16 February 2012

and water users. In Tajikistan, a Water Committee was established in Khoja Bakirgan Canal, with the aim to handle issues of irrigation and drinking water as well as environmental and ecological matters. However, the non-governmental nature of the Committee, though some governmental representatives were included, did not allow the institution to effectively and actively participate in decision-making processes. Furthermore, with the end of the project (December 2012), the Water Committee has already ceased to function and is about to disappear all together.

Canal Automation Project has for the first time introduced a mechanism that should have helped the Canal Management to obtain regular data that would have helped them in proper water planning processes as well as for transboundary consultation and negotiation. The Canal Automation project has, however, reached only halfway through the canal and needs to be completed.

Similarly, considering regular breakdown in electricity supply, especially in winter, the system is dysfunctional for 4-5 months. Management staff has been trained to operate the system but they have not been trained adequately to restore the system and the programme. As a result, much of the valuable data is lost and the system, as a result, does not perform as expected.

Khoja Bakirgan Canal Automation – Intake from primary to secondary canals

Irrigation Technology Demonstration Plots: Aside from provision of and training on flume water meters, the previous Fergana IWRM Project aimed to improve irrigation technology, such as irrigation regimes and determination of next irrigation period. Moreover, advice and training on agronomy, pest control and plant protection as well as on crop rotation and agro-technical matters, plus aspects related to organisational issues, such as accounting and legal procedures, would have further improved irrigation at pilot plots and would have enhanced farmers' skills and knowledge on improved land use and management. Discussions with specialists and some farmers, however, indicate that while some activities in select areas (6 out of 16 WUAs) have taken place during the last year of the project (Phase III in 2012) but the sudden disruption at the end of 2012 may have not allowed for the integration of these aspects of the project. This is so much true as the first two phases of the project have concentrated on producing a significant amount of training material and documentation that still needs to be consolidated, updated and made available for use among farmers.

Crop Yields and Profitability in Pilot Areas: Two local NGOs (Zar va Zamin and Irrigation-Agriculture Consulting) were assigned by the previous project to implement parts of the project related to introduction of efficient water technologies and issues related to improved farming practices. Both NGOs confirmed during meetings that numerous training materials had been produced by the main implementing agency and translated into local languages. Both NGOs also stated that lack of sufficient systematic approach to help farmers practically understand the benefits of enhanced land and water use and management, made the achievements of the project limited. Most of the training material had been developed during phases I and II and their introduction started only during phase III and as such its impact remained limited as the project ended by December 2012.

Discussions with groups of farmers and WUA representatives in the pilot area produced mixed messages, depending on individuals' background, knowledge and skills but also the level of education. In brief, most people interviewed, including technical specialists from the two partner NGOs, clearly stated that much of the training was conducted theoretically and there was very little practical application of the newly acquired skills and knowledge. One technical specialist stated: ***"…even though most enjoy going to training sessions, especially when coffee breaks and lunches are offered and transport and additional costs are covered plus some pocket money is provided…you cannot convince farmers in the classrooms of the benefit of radical changes…..you have to go and practically show them the change and its benefit on the field….."*** All participants clearly stated that future programmes must apply field-based practical approaches to improved irrigation technology and enhanced agro-technical skills. Interest among farmers and WUA representatives alike is huge on innovative ideas and technologies, especially as many have come to a state that they believe the status quo can no longer continue and that radical changes are required to make agriculture and farming more productive and profitable – perhaps partly as the result of the previous project's dissemination of information, training and capacity building, even if in smaller scale.

Water User Associations (WUAs): Over the past few years, over 100 WUAs have been created in Sughd, most in Syr Darya Basin, of which around 35 have been created by international organisations and the rest by the Special WUA-Unit of the Directorate of Water in Sughd. Both sections of the WUAs have their own disadvantages and weaknesses and aside from a few most are almost dysfunctional and according to local water authorities, many exist only on paper. Some major issues related to WUAs include:

- Local authorities created WUAs with the hope to use them as fee collectors, thus seeing WUAs as a vehicle of enhanced fee collection, rather than as clients and customers with viable technical and managerial capacities and efficient and with some level of financial sustainability.
- Many WUAs created by international organisations have gone through systematic training and capacity building but have not been able to become self-reliant, as most have been project-driven. Once projects have ended WUAs have begun to fragment without the "project incentives".

- There is a seemingly low level of financial viability among most WUAs and this is a reflection of the financial status of their members, the farmers. Unless farmers manage financial stability and farms become more productive and profitable, financial sustainability of WUAs will continue to remain a challenge.
- Lack of a nationally agreed and approved organisational concept has led to a whole range of WUAs with different institutional set-ups, confusing their roles and responsibilities and issues of governance, management and accountability towards their members as well as confused relationship between WUAs and canal operators.
- Nation-wide, the on-farm infrastructure has not been legally handed over to WUAs or to the farmers. However, as much of the canals and smaller channels are located within the boundaries of current small to medium Dehkan Farms, there is already growing conflict in some areas on the ownership of the canals among farmers. The best way forward would be to hand over all the on-farm canals and infrastructure, including on-farm pump stations to WUAs.

The previous SDC-funded Fergana IWRM has laid the foundation for viable farm-based irrigation and drainage institutions, in form of 16 WUAs along Khoja Bakirgan Canal. The first WUAs were established in 2005 and by 2007 the 11 of the 16 WUAs were pooled into "Khoja Bakirgan Federation of WUAs". 6 of these WUAs have benefited from a whole range of support, such as water use efficiency (water measurement equipment at farm level), introduction to improved land use techniques as well as improved cropping patterns. Yet, absence of resources and capacities to effectively maintain and sustain the infrastructure continues to be a major weakness. Lack of access to machinery allowing them to regularly clean and rehabilitate the system, absence to financial resources due to continued low farm productivity and profitability remain serious challenges. Similarly, these institutions are too weak to be able to effectively negotiate with water authorities and canal operators as customers and clients, rather than as water users and lack the ability to advice their members on improving farm productivity and profitability.

All 16 WUAs have been established within administrative boundaries, the former kolkhoz and sovkhoz, rather than along hydrological boundaries. Therefore, future interventions with WUAs should undertake a thorough assessment of the current WUAs and, where necessary, reorganise them along hydrological boundaries. In consultation with proper authorities, the Core Group must clearly establish the area, boundaries, and size of the hydrological unit to be served by the proposed WUA. This should be done before formally collecting baseline data within this area and before consulting with water users on detailed issues within the proposed hydrological unit, including planning processes.

Future WUAs must also be empowered to take full charge of the infrastructure and be financially and technically capable to operate and maintain the system and effectively negotiate with water department and canal operators on water planning and delivery as well as on issues related to water fee and their use. WUAs must be

allowed to withhold part of the income from the water fee for regular cleaning and maintenance and where necessary rehabilitation of infrastructure.

Sustainability of WUAs depend much on the sustainability of their members/farmers and unless WUAs are equipped with skills and knowledge to help farmers improve natural resources management, especially land and water, prevent further deterioration of land through inappropriate irrigation and avoid water logging and salination, their role would remain limited as fee collectors for the water department.

Watershed Conditions and Disaster Risks: Like many other parts of Tajikistan, watersheds in Sughd Oblast are in very poor and some in alarming condition. A combination of natural hazards further impacted by man-made disasters continues to deteriorate the watersheds. Much has been reported on hazards and disaster risks in previous chapters; therefore, for the purpose of this part of the report we will concentrate on water-related hazards and disaster risks.

Common natural disaster risks in Sughd include heavy rains especially during spring, flash floods, landslides and mudflow, earthquake as well as strong wind and regular drought. Due to its hydro-meteorological conditions, most of natural hazards take place between April and August, depending on weather conditions. Mudflows and flash floods - caused by heavy precipitation, especially during spring, and sudden snow melt in late spring and during summer – carry debris, gravel and often heavy stones down the watersheds causing severe damage to infrastructure, homes and agriculture land. Much of the water infrastructure, drinking and irrigation, is constructed across the rivers and are regularly affected by flood and mudflow. Absence of sufficient water and sediment reservoirs as well as effective drainage mechanism makes the situation more challenging to local authorities and communities.

Much of local and provincial response is reactive rather than proactive, due partly to absence of appropriate plans but also lack of financial and mechanical (machinery) resources. Lack of regular maintenance and cleaning of the riverbeds and inability to strengthen river embankments further increases vulnerability of the system at times of extreme discharge. The stony structure of the watersheds coupled with their poor condition – overgrazing and disappearance of forestry – with minimum absorption capacity further aggravate the situation resulting in constant erosion and increase in gullies. Continued population growth and the need for housing and agricultural land, combined with steadily growing livestock numbers, in an already fragile eco-system, further threatens people's lives and livelihoods as well as the infrastructure. Continued degradation of rivers and creek beds combined with illegal removal of gravel and stones from riverbeds, especially during dry seasons, for construction purpose, further exacerbate the condition of riverbeds resulting in long-term riverbed erosion.

Much of the natural hazards along Syr Darya Basin have transboundary character, especially between Tajikistan and Kyrgyzstan. Some originate in Tajikistan, like Aksu

Watershed, and affect downstream zones in Kyrgyzstan. However, as most rivers originate in Kyrgyzstan, downstream watersheds in Tajikistan are severely affected. Without viable transboundary collaboration, the situation is unlikely to change much in the foreseeable future. However, regular contact between the emergency committees on both sides and ongoing discussion on a framework agreement on shared waters between Tajikistan and Kyrgyzstan are positive signs indicating that both sides have common understanding of the problems and would need to work together to address the issues together.

Much of the hazards affect the poor in rural areas, whose lives and livelihoods depend entirely on agriculture. Absence of an early warning system puts these communities' homes, agricultural land and sometimes their lives at risk.
Last but not least absence of a viable alternative source of energy for cooking and heating and harsh weather conditions, especially in upstream zones, forces many communities to continue cutting trees, which, in turn, results in further deterioration of their situation and the condition of the watersheds.

Special attention was paid during the mission on Aksu River, originating in Rozrovut in Tajikistan – at the bottom of the Turkestan Mountain Range - passing through Kyrgyzstan and ending up again in Tajikistan before it reaches the Syr Darya. Massive erosion, huge gullies and excessive piles of debris and stone are clearly visible along the river. In some places, especially villages along the river embankment, the situation is alarming and its remoteness keeps the watershed farther away from authorities' attention.

The next chapter (recommendations) will discuss the situation in Aksu Watershed in more detail, including suggested interventions.

10.2. Lessons Learned and Perspectives for Effective Policy Dialogue at Different Levels

National Level Policy Dialogue: Over the past four years, Government of Tajikistan and its development partners have achieved significant progress in national policy dialogue. Starting with the Agrarian Reform process in July 2009 and the first joint National Development Council meeting in December 2010 consultation and dialogue moved to other sectors too, notably Private Sector Development, Governance Reform and Social Sector Reform, among others.

Policy dialogue on water related issues initially started in **July 2009** as part of the **Agrarian Reform Programmes** of the Government of Tajikistan with a special Working Group established within the MLRWR to agree on the reform agenda for the water sector, together with development partners engaged and/or interested in water sector. In **April 2011**, during the first **"International Agrarian Reform Conference of the Republic of Tajikistan"**, overall agreement was reached between the government institutions, notably MLRWR and development partners on the necessity to thoroughly **reform the water sector**, based on the following principles:

- **Water management** areas will be changed from territorial administrative to **hydrological** and geo-hydrological and hydraulic management areas.
- Efficient functioning, **Integrated Water Resources Management (IWRM)-based institutions** at national level will take care of policies and regulations that would allow efficient coordination across the sector, and at different scales, from local to international.
- **Transparent and accountable water governance institutions** with **tasks separated** in policy and regulatory, organisational and regulatory, and operational in line with modern efficient and performance based management principles. The policy making regulatory institutions focus on the public and common interest, the operational institutions on best operational practices and client service.
- **River Basin** Authorities would be created – four main basins, Syr Darya Kafernihon, Vakhsh and Panj along with several sub basins were proposed by the MLRWR – and tasked with basin-related regulatory and management activities under the guidance and leadership of the future Ministry of Integrated Water Resources Management (MIWRM).
- **Operational tasks** would be undertaken by separate and independent institutions - in case of irrigation, basin and scheme **MIROBs** - that would emerge out of existing water structures at national, provincial and local levels to ensure complete separation of policy/regulatory from operation of the water resources.

The process of policy dialogue through Agrarian Reform Programme was further enhanced by the creation of a **"National Policy Dialogue"** (NPD) funded by the EU and implemented by UNECE from 2010. In the meantime, the NPD has supported strengthening the existing **National Water and Energy Council** (NWEC), including creation of an **IWRM-Steering Committee**. Meanwhile, the NWEC includes representatives from all key ministries and state agencies engaged in the water sector. In April 2012, the NPD Project presented an updated version of the **"Roadmap of the National Policy Dialogue on IWRM in the Republic of Tajikistan for the period 2011-2016"**[20], including suggestion on the ways of transition towards IWRM for the period 2012-2015. **9 "Policy Packages"** reviewed at the meeting of the IWRM Steering Committee and its Working Groups and presented as part of the Roadmap include:

- Development of the Water Sector Reform Strategy to be completed by end of 2012
- Establishment of the MIROB and Basin MIROB Agencies (and where necessary Scheme MIROBs) with a timeframe for the activities in 2011-2016
- Establishment (and Strengthening) of Water User Associations, their Federations and (National) Council with a timeframe for activities in 2012-2016

[20] Roadmap of the National Policy Dialogue On IWRM in the Republic of Tajikistan (Updated as of April 2012), EUWI, Dushanbe, December 2012

- Establishment of River Basin Organisations as MLRWR's sub-division for the transition period (to become sub-division of the future IWRM Agency), with a timeframe for activities in 2012-2013
- Establishment of the IWRM Agency and National IWRM Council with a timeframe for activities in 2014-2016
- Improvement of Water Legislation and Transit towards IWRM with a timeframe of activities in 2012-2016
- Assessment of Opportunities to Introduce IWRM in Basin of International Rivers with a timeframe of activities in 2012-2016
- Establishment of the **Database and Management Information System** of IWRM in Tajikistan with a timeframe for activities in 2012-2016
- Meetings of the Steering Committee of the NPD on IWRM in Tajikistan to continue for the entire period 2011-2016.

In the meantime, most **activities in the Roadmap have been delayed** awaiting the most important policy decision by the Government of Tajikistan on the approval of the comprehensive reforms in the water sector. Considering the upcoming elections later in 2013, decision of such significance is not expected prior to elections and as such implementation of the Roadmap may as well be delayed until early 2014. However, the MLRWR has clearly expressed keen interest to **prepare the ground for piloting the reform agenda**. This would open the door for SDC, for instance, to play an important role in supporting the ministry to pilot the reform agenda in Syr Darya Basin.

For the purpose of this report, we will concentrate on Policy Package No. 1, Water Sector Reform Strategy. The process of strategy development started initially in 2009-2010 supported by UNFAO and USAID-funded Support for the development of Water User Associations implemented by Winrock International. As of 2011, the European Union (EU) provided extensive support in Technical Assistance (TA) for further development of the strategy as part of its contribution to the water sector reform dialogue between Government of Tajikistan and Development Coordination Council (DCC). The latest version of the strategy was presented to MLRWR and the Government of Tajikistan in December 2012, further refined in February and March 2013, through detailed discussions with MLRWR Working Group. This latest version is now with the MLRWR for final comments to be submitted by June 2013. Similarly, draft Resolution and Regulations have been presented by the MLRWR Working Group to the Government of Tajikistan in February 2013 for the approval.

As of early May 2013, the EU-TA also presented draft implementation and financial plans for the strategy that are expected to be discussed between the Government of Tajikistan stakeholders, in particular MLRWR, and development partners.

Water Sector Reform Strategy (Latest Version – December 2012): Of the Policy packages presented by the NPD and agreed by the Steering Committee and its Working Groups in 2011, the Water Sector Reform Strategy is the most relevant

policy package. The following paragraphs present a summary of the major elements of the strategy, taken from the draft produced by the EU Technical Assistance.[21]

The **main objective** to implement such reforms is: "*effectively planned, developing and operational water sector which is based on the rational policy, joint analysis and management of quantity and quality of the subsurface and groundwater resources, balanced use of water resources between various branches, using river basins as the water resources management areas and with the objective of economic growth for the Republic of Tajikistan, on a fair and equitable basis recognising the ecological integrity and respecting requirements for water resources of downstream countries in the river basins*".

Prerequisites **to achieve the above-mentioned objectives** are:

1. The water resources management area will change from the administrative-territorial to the **hydrological, hydro-geological and hydraulic units**;
2. **Effective functioning of institutions on the basis of IWRM** at the national level, providing the policy framework and strategic guidance which will allow effective coordination of actions between the various sub-sectors in water resources management and their concerned groups, at various levels of governance, starting from local participation and up to the international relations;
3. **Transparent and accountable institutions** for water resources management, whose functions are divided into institutions focusing on **policy and strategic guidance functions** on the one hand and on **operational functions** on the other hand. The new institutions follow modern management principles, based on efficiency and sense of duty. The institutions developing and implementing the policy should concentrate on the account of the state and public interests where the operational organizations have to concentrate their attention on application of the best and advanced service practices.

It is important, that at all levels and stages of institutional reforms all interested parties take part in planning, decision making and implementation, for questions of ownership developing the right solutions and in order to avoid problems in implementation.

Guiding Principles of IWRM: In order to achieve the above-stated objectives, fulfilment of some guiding principles is necessary, from which the main one is the application of IWRM in practice. In this document we use the **IWRM definition** included in the **Water Code of the Republic of Tajikistan of April 2012**[22], which is adapted to conditions of the country and according to which, IWRM is *"a management system based on the accountability and interaction of water (subsurface, underground and returnable waters) and land, and also other natural*

[21] Water Sector Reform Strategy, third version – for the Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan, Landell Mills, December 2012

[22] Water Sector Reform Strategy, Third version et al.

resources connected with them in the certain hydraulic boundaries, co-ordinating interests of various branches and levels of hierarchy in water use and use of the natural resources, involving them in process of decision-making, planning, financing, protection and development of water resources in interests of a sustainable development of the society and conservation of the environment".

It is necessary to notice that **IWRM is a flexible and practical approach** to water resources management. Strategy of reforms recognises that:
The water sector in Tajikistan has paramount value and, basically is regulated in centralized manner that involves the solution of variety of specific tasks taking into account the local requirements.

The water sector reforms strategy largely follows the principles of IWRM and **holistic water resources management**, and is ideally reviewed on a regular basis gradually including more of the elements of holistic water resources management that are initially difficult to incorporate.

The core of holistic use of water resources is the **concept of water as an integral part of the ecosystem**, where water is a natural resource for social and economic welfare the use of which is defined by its quality and quantity. During the development and use of water resources the basic needs of ecosystems need to be taken into account and the **integrity of ecosystems safeguarded**. However whenever the basis requirements of ecosystems are compromised, water users need to compensate in the form of additional fees to be used for additional ecosystem protection. **Core principles of holistic management** and use of water resources include:

- For the purpose of effective implementation of all tasks connected with the holistic water resources management, it is necessary to conduct **division between the existing tasks** (political, legislative), organizational tasks (planning, management, regulation) and operational tasks (water supply, maintenance service of systems, rehabilitation);
- **Environment** is recognised as a **water user** and its needs should not be compromised;
- During the definition of priorities of water use it is basically necessary to balance **requirements of all subsectors** so that not to jeopardize other objectives;
- **In case of emergency** situations, **potable water is the main priority** as it is the vital necessity. Water supply to environment also is very important, since in case of its destruction or damage, it cannot be restored and it can be lost forever.

Institutional changes for IWRM introduction will be taken in parallel and in concord with reform implementation process. Separation of policy and strategic regulatory functions from operational in water resources use will be the main principle governing the changes in management and the current institutional structure.

Consequently, institutional changes will be implemented at all levels with the purpose to facilitate the division of the two main functions:

- **Policy and strategic management: At the national level,** extending the mandate of the **National Water and Energy Council to IWRM issues**, increase effectiveness of the Secretariat which provides technical services and creation of the Ministry of Water Resources. Their tasks will include the integration of water resources **policy, strategic guidance, protection, management and planning functions**, as well as the consolidation of all aspects of water resources monitoring (including licenses and permits). The **basin organizations** will be responsible for the **policy implementation** and other IWRM-related supervision functions at the sub-national level. As for other sectors, the oblast-level departments of other sub-sectoral ministries and agencies will implement similar functions.

- **Operational Functions (Operation, Maintenance, Routine Repairs)**: Transfer of these functions for different uses to Service Providers (private or state enterprises) under the coordination of the government. These tasks include the fields of supply of drinking water and sanitation, irrigation, hydropower, industry, fishery, boating and recreational purposes, environmental or ecosystem services, as well as any other use of water. **For irrigation and drainage systems operational functions will be carried out by the State Unitary Enterprise MIROB** with subdivisions at river basin level, (and where appropriate, river sub-basins) and at the scheme level. Basin MIROBs and particularly Scheme MIROBs will be operating in the future in **close cooperation with water users and their representatives**. In the case of water supply for cities and villages, water supply, sewerage and sanitation issues are already assigned to administration of the SUE KMK and their sub-ordinate companies. In the large cities of Dushanbe and Khujand as well as in some medium-sized cities the authority on water supply and sewerage is delegated to companies under the supervision of the Municipalities.

- **The Basin Organisations under the Ministry of Water Resources will coordinate the activities of different service providers** and determine water allocation between different Sub-sectors.

The above paragraphs are clear indications that the Government of Tajikistan is willing to take difficult decisions and to adapt comprehensive reforms. Therefore, for the donor community as a whole and for SDC in particular, it is crucial to continue the policy dialogue at national level to keep the momentum for reforms. Continuation of policy dialogue would also help **development partners** effectively **coordinate their own initiatives** with State plans and avoid duplications and waste of scarce resources. **Mapping** donor and government **projects and plans** would help national authorities, especially the MLRWR to effectively plan the implementation of the water sector reform and take informed decisions, based on availability of technical and financial resources.

The water sector reform will have sustainable impact in the sector and on all users, even though in short-term it may cause disruption of an already weak and fragile system, particularly in the irrigation sector. Even though the **political decision has not yet been taken formally**, there is mounting evidence the government will go for these reforms. However, without financial and technical resources, the **implementation of the reforms would remain a challenge** for the government and it is time donors provide sustained support in the implementation of these reforms as they already have done so during the preparation and consultation process over the past four years.

Provincial Level Policy Dialogue: The **national level reforms have not yet fully triggered down at provincial and district levels**, nor has the process of policy dialogue. There are a few small-scale consultation processes by some development partners, including SDC, WB, UNDP and GIZ, much of it on issues related to transboundary cooperation. Similarly, **donor coordination**, as strong as it may be at the national level, has **not yet** been taken up **at provincial level**.

Therefore, assuming that provincial and district authorities would be the main vehicle for the implementation of the ambitious plans and programmes, it is urgently required to establish a **policy reform dialogue platform at provincial level in Sughd**, similar to that at the national level. This way, while provincial and local authorities would be more informed and take part in national debates, it would **facilitate regular coordination** among development partners and between them and provincial authorities. Synergy should be sought on the development of such a platform with GIZ, WB, UNDP and DFID plus some implementing partners, including key national and international NGOs. In view of the water sector reform pilot in Syr Darya, the future Syr Darya Basin Council would present the most appropriate platform for coordination and policy dialogue.

Local Water Councils/Committees: At the **local level**, a **Water Committee in Khoja Bakirgan** created under previous SDC-funded Fergana IWRM has already **ceased to function**. Despite participation by some provincial authorities, it seems that its dependence on the project has been too heavy but it also indicates that this may have been posed upon stakeholders from outside without the right process and appropriate dialogue. Since the project has been bringing in some benefits, stakeholders had agreed to regularly participate in the meetings and consultation processes. However, the fact that it has already ceased to function so soon after the end of the project (December 2012) indicates a **lack of sustainable measures and ownership** of the process by the local stakeholders. Therefore, future interventions must ensure stakeholders fully understand the benefits of such a consultation process and are fully committed to own the process and take it forward without too much support and intervention by an external agency.

With regards to Transboundary cooperation, the mission **could not find any such committee or council active in Isfara**, though **GIZ** is reportedly supporting the development of a **"Framework Agreement"** between Tajikistan and Kyrgyzstan on efficient joint water use **in Isfara and Khoja Bakirgan sub-basin**. However, recent

information from the MLRWR indicate that Tajikistan and Kyrgyzstan are willing to finalise a Framework Agreement for the international waters and have agreed not to address issues of specific rivers but **transboundary cooperation** as a whole, while detailed discussions on specific rivers and watersheds might take place between technical working groups once the overall framework agreement is signed by both parties.

Transboundary Activities: related to Syr Darya concentrate mainly around ongoing discussions and consultation on the "**Framework Agreement" between Tajikistan and Kyrgyzstan since 2008**. Supported by GIZ, SDC and the EU, the initial stage of the consultation was based on main international rivers.

With the establishment of **"Inter-Ministerial Working Groups"** by both states, consultation between 2008 and 2011 eventually led to an agreement that:

> *"…based on the experience of Chu-Talas commission, the Government of the Kyrgyz Republic and the Government of the Republic of Tajikistan agree to effectively cooperate on use of international rivers…with the goal to strengthen cooperation between parties on sustainable use and protection of water resources of international rivers crossing the borders of the countries…"*

The Framework Agreement foresees the establishment of a **"Joint Water Commission"; "Basin Committee of the Rivers"; and a "Secretariat"** that would serve the basin committees in both Tajikistan and the Kyrgyz Republic.

On 16-17 April 2013, while this mission was undertaking field studies, the **last Inter-Ministerial Working Group Meeting took place in Bishkek** and according to reports from the Tajik side both parties have agreed on major issues in the draft agreement. Parties have agreed to initially **reach an overall agreement on international waters, rather than limiting the scope** of the agreement to one or more specific river or watershed. **Governments** of the Republic of Tajikistan and the Kyrgyz Republic are **expected to formally sign** the final draft of the Framework Agreement sometime in **summer 2013**.

Considering the importance of the Agreement, especially in view of support to pilot the water sector reform in Syr Darya Basin and additional activities, it is vital that SDC continues its support to the process of closer collaboration between Tajikistan and the Kyrgyz Republic, in synergy with other actors, notably, the EU, UNECE and GIZ. Synergies should also be sought with SDC-Kyrgyzstan to ensure effective coordination for enhanced results on both sides and avoid duplication of activities.

Rozrovut at Base of Kuhestan Mountain Range, where Aksu River Orginates

11. Recommendations

SDC's long-term engagement in Syr Darya – experience from 8 years of work on the Fergana IWRM - has laid a strong foundation for its work in Sughd. Despite some criticism by national and local authorities but also by users and specialists in the region, the project has achieved some success. New institutions have been created, in the form of the Khoja Bakirgan Canal Authority, based on IWRM principles; 16 Water user Associations (WUAs) have been created, canal automation has been introduced for the first time and much work has been undertaken towards water productivity, introduction of water use efficiency and improved agriculture practices at plot level.

From consultation held with stakeholders by this mission, it is evident that perhaps the geographic location of the project base (in Tashkent) has been its greatest weakness, especially for Tajikistan and to some degree also for the Kyrgyz Republic, who have benefitted least from the project. Had the project been based closer to the project areas, results may have been greater and more sustainable.

Based on the experiences of the past 8-9 years and consultation with stakeholders at national and provincial level, including two Stakeholder Roundtable Workshops in Khujand and Dushanbe, the mission recommends the following activities and interventions for SDC's project on "National Water Resources Management in Tajikistan". It is worth mentioning that much of the investment would be required during the first phase of the project, years 1-4, while the second phase will concentrate more on consolidation, exit strategy and handover.

1. Support to Water Sector Reform Pilot in Syr Darya Basin

The Ministry of Land Reclamation and Water Resources (MLRWR) is leading the Water Sector Reform process, working closely with national, provincial and local authorities and development partners. Following three years of intensive work, supported through Technical Assistance by development partners and through a wide range of consultation from local to national levels, MLRWR is now finalising its Water Sector Reform Strategy that would be formally submitted to the Government of Tajikistan later in 2013.

Three major agreements have been reached for the comprehensive reforms:

1) Water Resources **Management** will shift from administrative territory to natural **hydrological boundaries** – River Basin Management approach - based on principles of IWRM.
2) Policy and regulatory functions will be separated from operation and maintenance functions. MLRWR will gradually transfer from an irrigation and drainage organisations towards an Agency of Integrated Water Resources (AIWR) developing policy and providing strategic guidance and overall regulation of all waters and all users. Basin organisations and, where necessary, sub-basin organisations, will represent the MLRWR and regulate, plan and manage the water resources, in close cooperation with users and

service providers. In relation to irrigation, an entirely separate and independent organisation, MIROB, will be created as a State Unitary Enterprise (SUE), directly responsible and accountable to the Government of the Republic of Tajikistan, supervised and monitored by the MLRWR (future AIWR) and working closely with basin authorities and water users on water planning, delivery, Operation and Maintenance (O&M), where there are no functioning WUAs also O&M of on-farm infrastructure would be the responsibility of MIROB – in this case scheme MIROBs.

3) **Water User Associations** (WUAs) would be further strengthened – where not available new WUAs would be created - and developed with full capacity to work closely with MIROB and scheme MIROBs on water **planning and delivery to the farms** and fee collection and represent the interest of water users at the basin council. WUAs will be empowered to undertake **O&M of the on-farm infrastructure**. **Federation of WUAs** will be created at scheme level pooling representatives of individual WUAs aiming to create the **National Association of WUAs** at national level to present users' interest further at higher level.

The **EU-funded Technical Assistance** has developed **detailed TORs** with clear definition of roles and responsibilities for all stakeholders, as part of the water sector reform strategy. (Landell Mills Ltd., for Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan, Appendix A: Water Sector Reform Strategy, December 2012 [Third version])

Activities Required for this Component: This component cannot be implemented at basin and/or sub-basin level and requires a holistic support to enable the MLRWR to pilot the reforms effectively and efficiently. Therefore, support to the implementation of the water sector reform pilot must be provided at national, basin and sub-basin levels as well as at the on-farm level. Activities in this component would include:

- **Establishment of national-level Basin Organisation** office under the MLRWR, with a small office to liaise basin-level regulation and management activities under direct management of the ministry. Under the direction of national basin authority, **Syr Darya Basin Organisation** (and sub-basin organisations, where deemed necessary) would be established. Support to final drafts of **legal and regulatory frameworks** would be a precondition for the basin authority establishment, as creation of any new institution and/or department within sector ministries has to be formally approved by the Government of Tajikistan. Some work was undertaken by the EU-funded Technical Assistance in late 2012 and early 2013 and would need to be followed up and completed. Establishment and development of **Syr Darya Basin Council** would become necessary as a platform for consultation and planning purposes between different stakeholders (representatives of other state organisations using water, such as agriculture, environment, energy and industry, drinking water and others, service providers – in case of irrigation MIROB representatives and representatives of WUAs).

- **Establishment of national, basin and sub-basin MIROB offices** as the main operating and service-providing agency for irrigation to be working closely in parallel with basin organisation and with WUAs. Development of a set of **legal and regulatory documents** would be required to allow the creation of MIROB organisation by formal approval of the Government of Tajikistan as an independent and separate organisation.
- **Strengthening existing WUAs in Khoja Bakirgan and creating new ones in Aksu sub-basins** makes the third institutional set-up for the reform implementation. In Khoja Bakirgan 16 WUAs and Federation of WUAs has been created by the previous SDC-funded Faeghana IWRM project. However, these need to be reorganised along hydrological boundaries with clear delineation of their boundaries. Similarly, extensive support is required over the next few years to make these WUAs more efficient and sustainable. In Aksu, there is one single WUA, created by another organisation a few years ago and never followed up. Considering the size and coverage of the river, 4-5 WUAs might be considered for Aksu to be built up from start and systematically supported over the next 8 years to become economically, technically and managerially viable WUAs. Towards the end of the first phase of the project, these WUAs would be pooled together into a Federation of WUAs enabling them exchange of experience and information as well as enhanced consultation and negotiation leverage with MIROB and Basin organisations.

Estimated Costs for this Component would be around **CHF 1,5 million** and would include provision of office furniture and equipment, including computers, and in case of MIROB and WUAs costs also include initial subsidy for office premises.

2. Support to Infrastructure Rehabilitation

Infrastructure rehabilitation would concentrate on two sub-basins, Khoja Bakirgan, where SDC has made significant investment over the past 8 years and Aksu considering its state, importance and proximity to Khoja Bakirgan.

Unofficial estimates by Sughd water authorities indicate some 50% of the main infrastructure in Syr Darya Basin requires rehabilitation, with a total cost estimated at around US$ 80 million. Costs for infrastructure rehabilitation for Khoja Bakirgan and Aksu are estimated at around US$ 25 million. Taking on the entire rehabilitation costs for the two sub-basins would be beyond the financial capacities of this project. Therefore, the project would concentrate on some priority rehabilitation needs that are deemed absolutely necessary. These would include urgent need for repair and rehabilitation of some primary and secondary canals and related hydraulic structures; repair and rehabilitation of badly needed irrigation and drainage wells in Khoja Bakirgan; rehabilitation of some on-farm infrastructure.

The cost for this component is estimated at around **CHF 5 million**.

3. Support to Capacity Building and Institution Development

Considering that IWRM and River Basin Management of the water sector takes place in Tajikistan for the first time, it is crucial to support all newly built institutions, organisations and structures from the MLRWR at the national level to WUAs at the grassroots level with extensive support to build viable capacities and institutions.

Activities in this component would include:

- Systematic approach to capacity building and institution development at the MLRWR, with special focus to Basin Organisation, ensuring new institutions are developed in appropriate manner and would be capable of performing their roles and responsibilities appropriately.
- Systematic approach to developing viable institutions and building necessary skills and capacities for the newly built MIROB at national, basin, where necessary, sub-basin and scheme levels. Being directly responsible to the Government of Tajikistan as a State Unitary Enterprise, MIROB organisation must have full-fledge institutional and skill capacities to effectively and efficiently plan and deliver irrigation water, based on users' needs and in working closely with basin authorities. Where no WUA exists, MIROB would also take the responsibility for O&M of on-farm canals, but its main responsibility for M&O would be the secondary canals. Under the current situation, it seems impossible to avoid further water debts as the system does not even allow the system to recover actual water costs (electricity, staff etc.), let alone allowing for rehabilitation and maintenance. Actual cost for one m^3 water, for instance, ranges 4-12 Dirham (0.04-0.12 Somoni) while water fee is set at 1.77 Somoni.
- Professional technical capacities, including the ability for water planning and operation mechanisms and working closely with WUAs and basin authorities on affordable tariff system would be some of the basic skills for MIROB officials. Similarly, water losses at secondary and tertiary levels are beyond acceptable norms, at around 35-40%, partly due to deteriorating infrastructure but also lack of regular cleaning and maintenance, and effective measures must be found to help MIROB and WUAs reduce water losses. Provision of basic machinery at scheme and WUA level would help users and service providers undertake regular cleaning and maintenance and thus reduce water losses to some extent, while addressing priority rehabilitation needs would further help improve the situation.
- Systematic approach to building viable and capable WUAs that are economically, technical and managerially able to deliver water to the plots/farms, maintain and operate the on-farm canals and channels and effectively negotiate and consult with basin and MIROB authorities on behalf of its members, farmers/users. Efficient water and land planning, use and management would be one of the key elements for WUAs and farmers to ensure farm productivity and profitability by reducing water use, safeguarding the precious land from further water logging and salination. Introduction of new farming technologies would enhance farmers and WUAs

capacity to base future agriculture pattern on efficient water planning and demand rather than on water availability. Computers would not enhance WUAs capacities but basic machinery and the skills to regularly clean irrigation and drainage infrastructure and rehabilitate where necessary would make them more viable and sustainable. Similarly, water measurement and meters would allow them to understand the rational for amount of water used in the farms and would further reduce waste of water and reduce, in turn, the cost of water for farmers.

- There would also be a whole shift in roles and responsibilities of current water authorities engaged in Syr Darya Basin. For instance, qualified managers and technicians from Oblast water department (Oblvodkhoz) would shift to basin organisations; most of the current canal operators, technicians and managers from Rayon water departments would move to either sub-basin or MIROB organisations. Therefore, it is crucial that clearly defined Terms of Reference, job descriptions as well as systematic training and capacity building are in place to ensure new institutions function according to the requirements of the water sector reform. Changing attitudes and management patterns would be priority areas to enable officials to function well in their new jobs and leave old traditional habits behind.
- Training and capacity building must entail a huge amount of on-the-job training, along with theoretical training as well as study tours, exchange and exposure visits, within and outside the country, allowing officials and representatives of water users to practically observe how other areas, regions and countries deal with their water resources. Similarly, provision of technical assistance and expertise from similar countries, which have gone through the same transition and reform would play very important role.

The Cost for this Component is estimated at around **CHF 1.5-2 million**, including the cost of the design of the capacity building and institution development, technical assistance and travel costs for specialised training outside the country.

4. Support to Canal Automation and Water Measurement

With regards to canal automation, the previous SDC-funded Fergana IWRM has made significant progress. Automation systems have been installed towards half of the Khoja Bakirgan Canal, assumingly as a pilot to observe how the system works and what needs to be improved for future interventions. Observations by this mission have revealed three main weaknesses:

1. The automation covers only half of the length of the Canal but perhaps the most important half as it would have allowed the Canal Management to have a better picture of the amount of water released overall from the main gate; the system reaches as far as the actual distribution to three main sub-canals.
2. For almost 8 months of the year, the system does not function as it entirely depends on electricity without any alternative source of energy, especially during winter electricity rationing; even during normal times when the power supply is disrupted for a short moment for some technical reasons, the

system stops. Consequently, all the data that had been collected gets lost, as there is no contingency plan to store previous data and restore the system.

3. The system seems to have been well designed and under normal circumstances it would offer the management badly needed data related to water flow and disbursement. However, no staff member from the Canal Management has been trained in the actual programming and maintaining of the system and therewith not for the maintenance of the data. For instance, during the mission observation, while computers showed the amount of water released from the main gate, there was no data shown on how much water is disbursed in each of the three target canals. When asked, we were told that the system was programmed for conditions with regular power supply and without any interruption. Staff from Canal Management was trained at each station to operate the system but they don't seem to have been trained on how to maintain and restore the programmes. Later, we found out that this was planned in the last stage of the programme, which never materialised.

In consultation with local and provincial representatives, the mission concluded that this part of the project should not have been implemented unless all the necessary issues, from training to maintenance and power supply were addressed. Instead, we thought provision of simple mobile water measurements would have been much more useful and practical.

However, as the system is there now and resources have been invested, it should also function and far more it should be completed along the entire canal length. Alternative source of energy should be identified, including possible micro hydropower station or installation of a generator (provided the authorities ensure regular provision of fuel) and similar approaches that would ensure regular and efficient functioning of the system. Similarly, intensive training for a few staff members would be required to enable them to restore the programme and the system when interrupted.

Once the system is restored and functions well it would offer excellent data to the management to have a more clear understanding of the amount of water available and disbursed on regular basis. It would also allow for automatic closure and opening of the gates when necessary - for instance, at times of severe floods to protect the infrastructure. Last but not least, it would produce solid useful data that could help authorities in their consultation and negotiation with their counterparts on the other side of the border in Kyrgyzstan.

The previous project has also delivered some 160 mobile water meter to some of the WUAs to measure the amount of water delivered from the secondary canals to the farms and further to the plots. Coupled with the canal automation, these measures have taken water measurement a step further. Where available, WUA representatives have made excellent use of the system and been able to regularly collect water fee from farmers, based on facts and figures. This has also resulted in

significant reduction in the water demand and farms and individual plots maximise the use of water.

However, these 160 water meters cover only about a third of the total requirement along the canal. According to Canal Management and WUA Federation, the total requirements for the entire canal were estimated at around 500. Therefore, it is necessary to equip all WUAs with simple but efficient water measuring system; enabling them to effectively measure the amount of water delivered and helps reduce water demand.

Considering the limited costs of the system, Canal Automation and farm-level water meters, and the minimum requirements, it is strongly recommended to introduce the same approach in Aksu sub-basin. However, taking into account the complexity of the river, priority areas along Aksu will have to be carefully selected. In view of the lessons learned from previous projects, the system must be simple, guaranteed with regular power supply (including support to provision of alternative energy sources during winter) and officials must be fully equipped with the knowledge and skills, not only to operate the system, but also to be able to maintain the programme and restore the system in case of failure.

The cost for this Component is estimated around **CHF 800,000**, including purchase of material (including hard and soft ware) and equipment, installation and training on use of the system.

5. Support to Watershed Management and Disaster Risk Reduction

Water-related disasters, partly due to poor agriculture practices and poor water use and management coupled with growing population and livestock, resulting in more intensive agriculture and overgrazing as well as deforestation, are on the rise. Natural disasters affect not only people's lives and livelihoods but also cause severe damage to water infrastructure too, much of it built along watersheds often within and/or across the rivers. Stakeholders identified this priority during individual meetings as well as during the stakeholder workshops.

However, addressing watershed management and disaster risks around Syr Darya Basin would be far beyond financial capacities of this project. However, the future project can establish and develop a model in one of the smallest but most needy watersheds that would offer government agencies and development partners an opportunity to replicate the model in other parts of Syr Darya Basin.

Considering the proximity of Aksu River to Khoja Bakirgan, where SDC has extensive working experience, the mission strongly recommends Aksu watershed as a viable and excellent opportunity for the project. In addition to this mission's observation, another SDC mission visited the watershed and also believes Aksu is a good choice to start with a comprehensive watershed management project.

Both missions visited the river right from its origin under Turkestan Mountain Range, only a few km from the last Jamoat in the valley, Rozrovut, through Kyrgyz territory (second mission only) and back to Tajik territory in Ghonchi District of Sughd.

Context: Aksu River is the left tributary of the middle reaches of the Syr Darya with the catchment area located between Kyrgyzstan and Tajikistan. Tributaries start from the northern sides of the Turkestan Range in Tajikistan and Kyrgyzstan, then flowing into the river on Kyrgyz territory before it crosses the border and is transferred to the territory of Tajikistan before it reaches the Syr Darya. With a catchment area of 1170 km^2, the total length of the river is 116 km, of which 54 km is in Tajikistan, 10 km along the border between the two countries and 25 km in Kyrgyzstan. Sarkat, a tributary of Aksu is also located in Kyrgyzstan with a length of 27 km. With an average annual discharge of 3.8 cm/s it provides irrigation water for 7,250 ha agricultural land in Tajikistan and an estimated 500 ha in Kyrgyzstan.

Table below shows areas, population and agricultural area benefiting from Aksu River in Tajikistan and Kyrgyzstan. While figures from Kyrgyzstan related to date from 2009 and may not be accurate, the total population benefiting from the Aksu watershed management in Tajikistan and Kyrgyzstan would be over 50,000 with an agricultural area of around 7,850 ha. Considering the scarcity of agricultural land in the area, especially in the upstream zones, the project would make significant impact on people's lives and livelihoods as well as on the environment and the natural resources. Similarly, a whole range of drinking and irrigation water infrastructure would be protected from regular heavy floods and mudflow.

	Tajikistan				Kyrgyzstan	
	Total Population	Population in Watershed	Total land (ha)	Land in watershed (ha)	Population in watershed	Land in watershed (ha)
Spitamen District	118,470	30,000	17,330	7,000		
Ghonchi District, Rozrovut Jamoat	14,800	7.400	520	250		
Batken Oblast, Leylak District					13,000 (data available as of 2009)	500-700 (estimated, no figures available)
Total	**133,270**	**37,400**	**17,850**	**7,250**	**13,000**	**600**

Sources: Spitamen Rayvodkhoz; Sughd Oblvodkhoz and Wikipedia

Situation Analysis: State of the watershed is characterized by landscape of hills transitory to rocky mountains, partially vegetated but heavily damaged by severe overgrazing and excessive use of water catchment for pasture and livestock. Along the river, numerous water courses and streams show visible signs of severe erosion, resulting in flow of thousands of tonnes of sand, mud and gravel to mid and downstream zones – during the dry season sings of these heavy flows can be seen as far as in Spitamen.

Continuous geological and hydrological processes over years – local population reported 6-12 major mudflows and floods in a year depending on precipitation and the speed of snow melt (slowly or sudden warming up of atmosphere) – have resulted in large scale destruction of terrace edges and river banks, including total collapse of river banks and its tributaries.

The main atmospheric precipitations generating mudflow is formed in the upper catchments of the river in Ghonchi (Tajikistan) and Leylak (Kyrgyzstan) districts. Module of maximum flow (1% probability) for Aksu River's upper watershed is 1000-1500l/s/km^2. Frequent and sudden occurrence of mudflows can be explained by striped watershed as result of

overgrazing and low absorbency of striped soils, especially in the upper reaches, where precipitations fall.

Activities in this Component would include a combination of rehabilitation of the watershed, establishing an early warning system, identifying alternative energy source, capacity building and emergency preparedness. Major interventions include:
Improvements of the catchment: such as construction of 3-4 small mudflow and water catchments/reservoirs, including one in Kyrgyz territory, in line with hydro technical norms and standards as well as construction of a medium-size hydro technical complex at the headwork of Shavkat Canal intake – includes water cum flood catchment/reservoirs that would also safe precious water during winter and a hydraulic spillway, preferably automatic to disburse overflow and excessive discharges. Currently, there is a small dam constructed from mud and gravel and every time there is a strong flood, it takes the whole structure away down the natural flow of the river. Similarly, the mission observed a number of heavy machinery in the riverbed digging just behind the dam, taking thousands of tons of sand and gravel for construction purposes that must be stopped to prevent further erosion of the riverbed and diversion of the natural flow of the river.
Rehabilitation of natural resources base, reforestation along the river, its tributaries and canyons, especially where human settlements and agricultural land are located. Integrated pasture management, including livestock growth control, increased fodder production and rehabilitation of natural pastures would support prevention of disasters in longer-term.

Support to alternative source of energy would be vital to prevent further destruction of an already depleted forestry. The region offers opportunities for solar and wind energy production for much of the year. However, initial support could be provided in transport of additional coal from Saluda coal mine in Kyrgyzstan that many people in Ghonchi District already utilise but most cannot afford the cost of transport and have to rely on traditional heating and cooking fuel, including cutting trees.

Appropriate Early Warning System should be considered taking into account the local conditions, such as absence of electricity during 6 months (late autumn and winter). The system should be preferably installed in the upstream, Rozrovut Jamoat, allowing local authorities to swiftly inform middle stream areas in Tajikistan (Dahkat village and surrounding) and Kyrgyzstan as well as downstream areas of Ghonchi and Spitamen of heavy precipitation, possible heavy floods and mudflow. The system must be able to allow regular communication between local Hukumats in Rozrovut, Ghonchi, and Dahkat and in target areas in Kyrgyzstan. Synergies should be sought with the existing cooperation between the directorates of emergencies in both countries, especially the close cooperation between their Batken and Sughd branches.

Capacity Building interventions would be required to ensure the sustainability of the project, including improved natural resources use and management, from water to land, pastures to forestry as well as introduction and training of early warning

system by local authorities and select community representatives in target areas. Development of community-based organisations on natural resources management and use, along with practical demonstration plots near the canyons and riverbeds would be most appropriate. This would include development of sustainable water, pasture and similar associations that could be considered as the initial steps of community organisations.

Provision of **heavy-duty machinery** in upstream zones, Rozrovut and Dahkat (in Tajikistan), such as bulldozers, excavators and cranes, with capability to lift and work through sand, gravel and debris of up to 10 tons. This would enable local authorities to continuously regulate the water and mudflow and prevent further erosion of riverbanks and terraces.

This project would facilitate the establishment of **initial steps for transboundary dialogue cooperation and coordination**, at least at provincial level and would further support the ongoing negotiations and consultation between Tajikistan and Kyrgyzstan on the planned Framework Agreement but also the ongoing consultations between the two countries' emergency departments (provincial level). Lessons learned and best practices from this project may also be taken further for similar cooperation and coordination on other watersheds and rivers that the two countries share.

The Cost for this Component is estimated at around **CHF 3-4 million**, including some activities and synergies in Kyrgyzstan. These costs would include infrastructure rehabilitation, riverbed and canyon rehabilitation, natural resources management and use best practices, alternative energy sources, early warning system as well as development of viable capacities and community-based organisations and institutions.

6. Water Information System (WIS) and Asset Inventory

Integrated Water Resources Management (IWRM) requires an Integrated Water Information and Management System (IWIMS) to effectively monitor, manage, plan and protect the resources. A comprehensive system would enable the government to manage and utilize the country's water resources more sustainably that would ensure:

- Access to safe adequate water to meet their basic needs;
- Monitor hydrological variability and other hydrological events in the country regularly and take necessary actions where necessary; and
- Monitor the planned water resources management, development, protection, maintenance and use more efficiently.

An efficient water monitoring and information system would need to identify administrative and institutional arrangements for effective information management, involved in surface water, ground water, water quality, climate and ecological issues, urban hydraulics and agriculture hydraulics. In the initial stages,

this would require the development of an inter-institutional mapping and effective tools for coordination and cooperation, considering the many stakeholders in the water sector. Synergies should be sought with the ongoing National Policy Dialogue platform – the National Council for Water and Energy. Furthermore, analysis and assessment of legislative context and requirements would also be undertaken in the initial stage.

While a centralized IWIMS is necessary to store and analyse all data and information produced by all stakeholders at all levels (national, regional and local), efficient dissemination of data and information would be equally important to ensure equitable access to information for all stakeholders.

While such a comprehensive system would require time to develop and mature, the completion of the Asset Inventory System (AIS) should be taken as a priority and as a starting point for the national IWIMS. In view of planned piloting of the water sector reform in Syr Darya Basin, it is crucial that the MLRWR has a full inventory of the assets, infrastructure and their state before handing over to newly developed organisations and institutions – basin authority, MIROB, WUAs and others.

The cost for this Component is estimated at around **CHF 500,000** initially, including system development, provision of computers and software as well as training and capacity building. Depending on how quickly the system would be developed and efficiently utilised, the need for additional support might arise at a later stage.

7. Support to Policy Dialogue, Coordination and Development of a Project Steering Committee

National level policy dialogue is addressed through two important platforms, namely the Agrarian Reform process between the Government of Tajikistan and its development partners and the National Policy Dialogue (NPD) funded by the EU and implemented by the UNECE. Despite sustained work between 2010 and 2012, the process of Agrarian Reform has currently slowed down and development partners need to work on pushing the agenda forward.

The NPD has, in the meantime, made significant progress in expanding the mandate of the National Water and Energy Council towards an IWRM Council, including an IWRM Steering Committee and related Working Groups. The steering committee regularly reviews progress and plans and adopts new measures where necessary.

There is **no Regional Policy Dialogue** in place in Sughd, though few development partners are engaged in the water and other sectors. During the stakeholder roundtable in Khujand, high-level provincial authorities expressed urgent desire for the establishment of such a platform, where relevant provincial authorities and development partners could meet regularly and discuss common issues and address those jointly.

Therefore, while it is crucial to continue support for the national policy dialogue, the establishment of a similar platform at provincial level must be seriously considered, especially in view of the water reform pilot in Syr Darya Basin.

Recommended activities in this component would include the following:

1. National Policy Dialogue: There are two possible scenarios for the national policy dialogue, with special emphasis on water sector: 1) Provide additional support to the ongoing NPD that would enhance its activities further through the council for water and energy. This could be in form of additional technical assistance or supplementary budget that would allow for additional expertise to be dispatched where needed. 2) Enhance the work of the ongoing agrarian reform process by providing an additional water policy specialist to concentrate specifically on water sector reform issues.

2. Regional Policy Dialogue and Coordination: Approach development partners and provincial authorities separately in the initial stage and assess the situation and identify the need for a policy dialogue platform. Making use of the best practices from agrarian reform and NPD, help to establish a viable platform, involving key provincial authorities, directly or indirectly engaged in the water sector, and development partners engaged in the water sector (irrigation and drinking water, environment etc.) and key local NGOs with specific expertise. Such a platform should also be used to bring some representation from water users and their representatives, through WUAs as a first step towards dialogue between provincial authorities and users with the aim to bridge the gap between overall policy and strategy and actual needs of the water users. The provincial government has already established a similar committee on environment with participation of key sector representatives and the civil society and NGOs. This could be taken further as a good practice and a model that might require refinement and adaptation.

Once the water sector reform has been formally approved and basin authority established, the platform should then be transferred to the Basin Council. The project would provide technical expertise, especially policy/reform specialist to act as secretariat, facilitator and mobiliser and organiser. The facilitator/secretariat would also help develop necessary documents, organise area-specific workshops and seminars and where necessary training and capacity building for key provincial staff, including exposure visits and study tours within and outside the country.

This platform could also provide an effective mechanism for coordination among development partners and between them and relevant provincial authorities.

Note: It is worth mentioning that it may not be advisable to leave issues of policy dialogue and overall coordination to the Implementing Partner (IP) for the project, though it might entirely depend on the IP's capabilities, expertise and experience in policy dialogue. One way to ensure effective and efficient policy dialogue would be for the SCO office to lead this part of the activity as an umbrella intervention and as a matter of importance at national and regional levels.

3. Project Steering Committee: Active participation of relevant provincial authorities and their sense of ownership of the project throughout planning, implementation, monitoring and evaluation would lay a solid and strong foundation for the sustainability of the project. However, project sustainability depends also very much on the users and their representatives. Therefore, the project steering committee should ensure equitable participation of most critical stakeholders.

The following set-up for a possible steering committee is only a suggestion and would require additional assessment and analysis by the implementing partner.

> Suggested Membership of the Steering Committee: would include one representative of the Office of Sughd Governor, preferably one of the Deputy Governors; Head of the Oblast Directorate of Water (as Chair of the committee); Heads of Departments of Agriculture, Environment, Emergency Situation; one SCO representative; Head of IP agency and 2 WUA (or WUA Federation) Chairs.
>
> Meetings of the Steering Committee: The Head of the Oblast Water Department would chair the meetings (to be replaced by Chair of Basin Council later) and IP would provide logistics, organisational and secretariat support. In the initial stage of the project, the committee might need to meet once a month. However, once planning processes are finalised and implementation has started, the committee would meet every three months. These meetings would review progress according to agreed plans and agree on next steps and plans. The IP would develop a viable, feasible and user-friendly monitoring and evaluation system, allowing stakeholders to regularly undertake monitoring and evaluate of the activities and achievements. IP would ensure submitting regular progress report (even if a summary report) in Tajik language to members of the Steering Committee (to be replaced later by members of the Basin Council).

The cost for this Component is estimated at around **CHF 500,000** including all elements of the component, such as technical assistance, cost of meetings, seminars, workshops, stationery etc.

Notes: The cost estimates given for the implementation of the recommended interventions are rough estimates. Therefore, it is highly recommended that the Implementing Partner undertakes a whole series of assessments and cost-benefit analysis for each of the component. Similarly, even though a huge amount of data has been collected, there might be need for additional data and information.

These and similar activities might require a certain amount of time in the initial stage of the project implementation. In other words, introducing an Inception Phase of minimum three months and maximum 6 months should be foreseen at the start of the phase one of the project.