



Technical Assistance Consultant's Report

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Uzbekistan: Support to Policy and Institutional Reforms in Water Sectors

Prepared by The Louis Berger Group, Inc.

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Asian Development Bank

FINAL REPORT

SUPPORT TO POLICY AND INSTITUTIONAL REFORMS IN THE WATER SECTOR

PREPARED FOR

**Ministry of Agriculture and Water Resources,
Government of Uzbekistan and the Asian Development Bank**

VOLUME 1. MAIN TEXT

LOUIS BERGER GROUP, INC.



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ABBREVIATIONS

ADB	Asian Development Bank
ADB WUA Guidebooks	Six Guidebooks for Water User's Associations in Uzbekistan
ASBIO	Amu-Surkhan Basin Irrigation Organization
BIO	Basin Irrigation Organization
BOQ	Bill of Quantities
CabMin	Cabinet of Ministers
CAR	Central Asian Region
CAREWIB	Central Asia Region Environment and Water Information Base
Consultant	Louis Berger Group, Inc.
DFR	Draft Final Report
EA	Executing Agency, the MAWR
EU	European Union
GoU	Government of Uzbekistan
FW	Federation of WUAs
Ha	Hectare
IDF	International Development Funder
IMT	Irrigation Management Transfer
ICARDA	International Center for Agricultural Research in Dry Areas
ICBA	International Center for Biosaline Agriculture
IPS	International Project Services, Ltd.
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
Km	Kilometer
LBG	Louis Berger Group, Inc.
M&E	Monitoring and Evaluation
MAWR	Ministry of Agriculture and Water Resources
Ministry	Ministry of Agriculture and Water Resources
Mirab	Irrigation Water Distributor ("Ditch Rider")
O&M	Operation and Maintenance
OHGRE	Oblast Hydrogeologic Reclamation Expedition
Oblast	Province
PCU	Promotion and Coordinating Unit
PIM	Participatory Irrigation Management
PIU	Project Implementation Unit
PMO	Project Management Office
Project	Amu Zang Irrigation Rehabilitation Project
Rayon	District within a Province
RWCC	Rural Water Consumer's Co-operatives
SANIRRI	Central Asian Irrigation Research Institute
SDC	Swiss Agency for Development Cooperation
SO	state-ordered
SPAWD	Surkhandarya Province Agriculture and Water Department
TA	Technical Assistance
TACIS	Technical Assistance to Commonwealth of Independent States (EU)
TIIM	Tashkent Institute of Irrigation and Melioration
TOR	Terms of Reference
UNDP	United Nations Development Programme
URM	Uzbekistan Resident Mission
USBR	United States Bureau of Reclamation
Uzbekistan	The Republic of Uzbekistan
"Uzghiprovdkhoz"	Uzbekistan National Water Projects Design Institute
WSRSU	Water Sector Reform Support Unit
WSU	Washington State University
WUA	Water User Association

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I. EXECUTIVE SUMMARY

A. Background and Scope of the TA

1. This Technical Assistance (TA) project was developed by the Asian Development Bank with support from the Ministry of Agriculture and Water Resources (the Executing Agency - EA) of the Republic of Uzbekistan (Uzbekistan). Louise Berger Group, Inc. (Consultant) won the tender to execute the TA.

2. This TA Final Report is organized around a standard ADB format. A lengthy historical background about the development of Uzbekistan's large irrigation and drainage infrastructure, the Aral Sea environmental crisis which the world became aware of just prior to the dissolution of the Soviet Union and the evolution of various internationally-funded water resources projects follows which describes the setting for this TA.

3. The TA grant is connected with a major ADB loan for infrastructure rehabilitation and agribusiness development in the 130,000 hectare Amu Zang basin area of Syrkandarya Province in southern Uzbekistan. The Ministry of Agriculture and Water Resources is rapidly turning over operation and maintenance responsibility for pump stations, canals and drains to new Water User Associations throughout Uzbekistan. So this 18 month TA envisioned providing support to policy and institutional reforms in the water sector at both the national and Surkandarya – Amu Zang provincial / basin levels.

4. The TA envisioned influencing the development of policy and institutional reforms through the establishment and development of two new work units in the Ministry of Agriculture and Water Resources – one at the national and the other at the provincial level. A strategy of training trainers would be the preferred method for further extending the TA findings.

B. Principal Activities of the TA

5. The Consultant reduced 90 different output tasks listed in the Terms of Reference down to 16 major tasks, split almost evenly between the national and basin levels. A team of 4 local specialists and 3 international specialists was recruited to accomplish the TA tasks. These tasks included initial organizational and farmer assessments, a plethora of bi-monthly written reports and training workshops (the latter occurring mostly at the basin level with field practitioners).

6. The TA began poorly when the EA proposed to replace all 4 domestic specialists previously approved by the ADB. The ensuing discussions and final compromise delayed the effective start of the TA by 5 months, hamstrung the international Team Leader in giving in situ leadership and caused further delays of strategic tasks because key international specialists could not be mobilized on time. Worse yet, this initial conflict set a tone of effective non-engagement between the EA and the Consultant. The Consultant delivered over 900 pages of reports in two languages and conducted 19 workshops with no written comments from the EA nor ADB and little verbal dialogue.

C. Outcome of the TA

7. Five of the 16 tasks were fully completed by the Consultant. Eight were more connected with the Project Implementation Unit's (PIU) well-budgeted activities at the Amu Zang Project level. The Consultant's domestic specialist team was kept busy producing most of the 90 output tasks. It seems that if the Consultant Team Leader had been able to form his team before his initial budgeted time of 2 months (extended to 3 at ADB's request) had expired and received a warmer TA project welcome, he might have been able to give management attention to the most strategic activities.

8. Therefore, Task 4 (Setup & strengthen the national MAWR Water Sector Reform Support Unit - WSRSU) and Task 13 (Setup the provincial SPAWD WUA Promotion and Coordinating Unit) were not accomplished. Furthermore, the major results of a 3 month assignment by the international Training Specialist – developing a Study Tour abroad for WSRSU Trainers – was rejected by the EA. Instead the EA lobbied for and received additional WUA workshop training in 7 other provinces of Uzbekistan.

9. Three of five contract variations proposed by the TA were accepted by the ADB. The impact of each ADB contract variation decision usually had both a positive and a negative impact on project implementation, with the exception of the first which upset the whole schedule.

10. Despite the difficult start and missing a most strategic task due to perceived lack of interest and therefore support from the EA, the TA identified many traces of gold, which if further panned for, could lead to some mother lodes. In non-miner's terminology, there are many silver linings in this cloud.

D. Findings

11. Five framework categories are used throughout the report for classifying issues: Policy, Legal, Economic – Finance, Institutional and Technical.

I. Policy

12. Judged against international criteria for the foundations necessary to pave the way for successful water sector reform, Uzbekistan comes up pretty short. It is necessary, however, to keep in mind that as a young nation, Uzbekistan's legal base is still in the formative stages. The Government of Uzbekistan's (GoU) interest in water sector reform seems to take a distant second place to rehabilitation of infrastructure. Most successful Participatory Irrigation Management (PIM) / Irrigation Management Transfer (IMT) programs have occurred when reform precedes infrastructure rehabilitation.

13. There are some doubts that the MAWR has the leadership mandate and capacity to re-orient itself to a service and regulatory agency as envisioned for water reform. It may take a rural sensitive, non-MAWR manager to begin steering this big ship in that direction.

14. Two major realities lie in Uzbekistan's favor which need to be capitalized on in its water sector reform plan. The first is the reorganization of water systems administration on the hydrographic (basin) basis in 2003. The second is Uzbekistan's cultural strength in collectivism. If the people can be motivated under strong leadership, the potential for success is great.

II. Legal

15. Major work is needed to put together a comprehensive Water Code for Uzbekistan. There are many existing and proposed versions of laws and legal documents which would keep any water lawyer permanently confused. What's more, there is an extreme lack of water law specialists in the Parliament. Opening up the required intense stakeholder participation – developing a water lobby - by inviting specialists in education, water management and the NGO community onto parliamentary subcommittees is a step in the right direction. European Union supported projects in land reform, after 8 years, resulted in a Land Code and supported the eventual development of Uzbekistan's land market which is poised to launch in 2008. A serious effort at developing a Water Code will take no less effort. Kazakhstan did not get its legal basis for water charging in order for a decade and suffered for it.

16. Holding clear title to land should go a long way towards improving water and land management. Most farmers naturally want to pass on their land to their children with the

encouragement to take even better care of it than they did. With land as collateral, loans can be obtained for making long term investments in the farming and water infrastructure.

III. Economics and Finance

17. There is a pre-Soviet precedent of paying 12.5% of one's gross farm income for irrigation services. On a case by case by case basis, certain categories of water user groups (based on land type, pumped scheme or not, crops) should be able to pay for water services. The Project looked into this deeper than the TA. The TA did not envision mobilizing an Economist specialist though one international legal and institutional specialist slated to come did have an economics background.

18. In 2004 68% of the MAWR operations and maintenance (O&M) budget was spent on electricity for pumped irrigation water. Land is going out of production from waterlogging and salinization faster than it can be reclaimed elsewhere. This issue can be overwhelming to those charged with getting more out of the land – from the water manager down to the farmer.

19. There is a lack of agricultural and resource economics specialists for market economies in the region. Proper studies and calibration of computer models is lacking – the one exception being the ZEF University of Bonn – Khorezm project on water resources and environmental degradation.

IV. Institutional

20. Lack of depth in modern Human Resources management in any organization was identified as a major constraint which has not yet been addressed in any of the conducted trainings with the TA or Project.

21. The development of Water User Associations (WUA) must occur in a nurturing NGO environment. There are concerns about WUAs becoming a quasi-government vehicle for continuing state ordered commodity production policies. Encouragement to develop Federations of WUAs earlier than later will improve the communication links and eventually make the MAWR's work easier. International experience indicates that women involved in decision-making contribute significantly to quality and sustainability of water projects.

22. A lot of work has been accomplished in developing model documents for WUAs. Adding visits to existing pilot WUA's which have had international development support for some time will help any legal or NGO specialists further refine these documents.

V. Technical

23. Half of Uzbekistan's 4.4 million hectares of irrigated land is waterlogged or salinized. Rehabilitating irrigation and drainage infrastructure to improve this can be overwhelming for any government's budget. The TA identified that the drainage collectors and technical reclamation status of groundwater and salinity at the inter-farm and on-farm levels seems to be without a steward at present. ADB's Central Asian Countries Initiative for Land Management project and GoU 2008 emphasis on reclamation will help raising awareness on the downstream and underground impacts of farmers' water management activities.

24. Most WUA canal turnout gates need repair, they have no water measuring device at the turnout, and their heavy equipment and communications systems are inadequate.

E. Recommendations

25. Nineteen recommendations of a programmatic nature under the five framework categories are listed (Table 4) with expected outcomes (Table 5) further on in this report. Most are concerned with capacity development issues.

26. Five recommendations / expected outcomes stand out to the Consultant with the highest strategic importance:

1. Establishment of the Water Sector Reform Support Unit in MAWR
 - Focal point for reform process established
 - National policy & law maker dialogue / coordination improves
 - Learn from existing WUA pilot projects
2. S&ME credit investment in farming & agribusiness under emerging land market
 - Employment generated
 - Land & water management improves
3. Human Resources training for mid-career managers
 - Future benefits begin with today's training investments
4. Development of MSc WUA Manager curricula / practical internships in WUA pilots
 - Higher water education engaged as partner in reform process
 - WUA Manager career track initiated
5. Accelerate bioremediation as alternative or in conjunction with infrastructure rehab
 - Farmers return to abandoned land
 - Social / economic pressures in regional cities reduced
 - Food security improved

27. True reform is about breaking the hold of monopolistic structures / systems / ways of thinking which keep people disempowered, and introducing a competition which allows those same people some choices. When the economic engine is allowed to warm up and checks and balances are in place which limit the abuse of absolute power, there is no holding back because the new wine is much better than the old. Prices will decrease, quality of goods and services will increase, an emerging middle business middle class will do something about oppressive bureaucratic burdens, and investment and employment will increase. People are Uzbekistan's greatest asset. The majority of the recommended interventions are about empowering people in a participatory environment to participate in designing their country's great future.

II. BACKGROUND AND SCOPE OF THE TA

A. Introduction and Background

28. The following introduction is a very quick and incomplete picture of how this Technical Assistance (TA) project came about and was initially staffed. It may help the reader interpret the flavor and bias on project outcomes.

29. Uzbekistan doubled its irrigated land area to 4.4 million hectares in just 25 years (1960 – 1985+-). This outstanding Soviet feat in training men and harnessing machines to design / construct / operate / maintain water infrastructure, along with attendant development in agricultural systems production / processing / marketing has probably not been duplicated on a per capita basis anywhere. A notable earlier achievement in the same spirit in 1943 was the digging of the 240 kilometer long Big Fergana Canal by thousands of laborers in 53 days.

30. With the dissolution of the former Soviet Union in late 1991, international development founders (IDF) and other development partners (including individual as well as collective countries) began arriving in Central Asia, to various degrees eager to advance their own political agendas, promote democratic reform, provide support for the region's transition to a market economy and develop markets. The Aral Sea environmental crisis, which had evolved through decades of unsustainable agricultural and water resources policies, especially attracted a number of funded studies. Some of those led to grants or loans to improve drinking water supply infrastructure in the pre-Aral countries of Kazakhstan, Turkmenistan and Uzbekistan. Others have been concerned with on-farm irrigation and agronomic management because over half of Uzbekistan's irrigated land is waterlogged and salinized and the fertility of desert soils initially low in organic matter has been further depleted under a cotton monoculture. Still other water projects have attempted to stimulate regional (now international) cooperation in developing Aral Sea basin water resource compacts.

31. As countries began to pursue their own style of political and market reform and donors gained more experience in the region, the types of agricultural and water resources projects began to diversity. Kazakhstan and Kyrgyzstan, because they early on demonstrated to donors an interest in land reform / privatization, began receiving institutional and technical support for various models on Irrigation Management Transfer (IMT) or Participatory Irrigation Management (PIM) through the development of Water User Associations (WUA). Because many international players (funding agencies, training organizations, international consultants) gained their first regional experience and located their headquarters in these countries (mostly Kazakhstan), project development models, institutional reform methodology and technical literature tended to arrive in Uzbekistan from the east.

32. Donors are coming to learn that one size does not fit all. This has much to do with cultural differences (Kyrgyz and Kazakh: pastoralists compared to Uzbeks: farmers), and now the size of typical land holdings (Kyrgyz: 1 hectare (Ha) compared to Uzbeks: 50 Ha). Uzbekistan is the most populous country in the region. From czarist and Soviet times, it held the lead for Central Asia in military, medical, education, research, agricultural, and industrial spheres. Uzbekistan has not embraced reforms or methods coming from neighbors to the east, but has sought to chart its own path. International partners and consultants have gained experience in the region and would like to duplicate their results here. This sets up some tension on how to go about development activities.

33. However, the physical water delivery and agricultural systems infrastructure with attendant top down management style throughout the region were largely developed in a consistent Soviet engineering / production / administrative fashion. It has been said elsewhere that the Soviet regime left a legacy of an under-funded, multi-level bureaucratic water resources management structure. While institutional reform is occurring in different ways and paces, the water delivery infrastructure is deteriorating and the national cadre of experienced design / construction / operations / maintenance personnel are retiring throughout the region. Very high on the list of priorities for the Government of Uzbekistan (GoU) in 2007 are measures to arrest the infrastructure deterioration and land degradation in order to sustainable support – both for food security and employment - a growing population.

34. The circle of locals who have been engaging with IDF's and other development partners on water projects in Uzbekistan has been quite small over the last decade. Consequently, much of the informal training which has "rubbed off" from international to domestic consultants has been confined to a few dozen local specialists. A monopoly in the recipients of international level managerial, administrative and technical capacity building has emerged which has precluded participation from a wider range, including present staff in the Ministry of Agriculture and Water Resources (MAWR).

35. ADB funded the Ak-Altin Agricultural Development Project Loan in the Syr Darya Province of Central Uzbekistan. This focuses on irrigation and drainage infrastructure rehabilitation, development of private pilot agricultural businesses for agricultural input supply

and market diversification and farmer training. A TA grant on Institutional Support for Sustainable Agricultural Development was tacked onto that loan. One major output of this TA was the production of six Guidebooks for Water User's Associations in Uzbekistan, the first of its kind in Central Asia. That 350 pp.+ literature "drew heavily from the experiences of the Integrated Water Resources Management (IWRM) in Uzbekistan's Ferghana Valley. This IWRM project in Ferghana, where one of the very first WUAs in Uzbekistan has been developed, is funded by the Swiss Agency for Development Cooperation (SDC) and is jointly managed by the International Water Management Institute (IWMI) and the Scientific Information Center of the Interstate Commission for Water Coordination (SIC-ICWC). Also the preparation of these manuals was fully supported by the US Agency for International Development (USAID)". Another ADB TA supported the publication of the Guidebooks.

36. In the year 2000 there were about 11 internationally funded projects in Uzbekistan which were providing training to that many new pilot WUAs. Now in 2007 there are over 2000 WUA's which presently exist in Uzbekistan, coming on by government mandate at a rate of 350 per quarter. At least 6 major internationally funded projects presently have a WUA component funded or operated by organizations such as ADB, World Bank, Switzerland SDC-SECO, Japan JICA, USAID, EU or Germany ZEF. Many growing pains have emerged from this national policy of rapid WUA formation. This just underscores the crucial need for establishing a National Water Sector Reform Support Unit under MAWR which this TA envisioned.

37. This TA on Support to Policy and Institutional Reforms to the Water Sector in Uzbekistan was also tacked onto an ADB loan connected with water system infrastructure improvements: "Amu Zang Irrigation Rehabilitation Project" (Project) in Surkhandarya Province. The Project has "the stated goal to maintain and improve agricultural productivity and farm income on a sustained basis. The project objectives are to (i) increase the reliability, efficiency, and sustainability of irrigation water supply of the Amu-Zang irrigation system; and (ii) facilitate and accelerate agriculture sector reforms in the project area."²

38. It seems that ADB's technical assistance grant for national and provincial water sector reform associated with an infrastructure loan at the provincial level is the preferred means to influence national policy in institutional reform and cost recovery for loan repayment. This is a very ambitious ADB policy target. It should therefore be a high ADB priority to coordinate this TA with the Project Management Office (PMO) which is led by a competing Consultant for the Central Asian region consulting market, as well as with other infrastructure loans and WUA development activities in the country.

39. In 2000 a European Union (EU) funded Technical Assistance to Commonwealth of Independent States (TACIS) expatriate water project team leader initiated the convening of a periodic working group of donors and their consultants to share lessons learned and work at coordinating activities. Through 2006 this effort expanded to a formal quarterly Water Donor Roundtable meeting where almost anybody could observe, project highlights were shared and minutes were published. With the advent of the Central Asia Region Environment and Water Information Base (CAREWIB), the major donors in 2007 decided to downsize and limit participation to themselves and their invited guests. A consistent theme in those discussions was the lack of access by IDF's and their consultants to policy makers at high levels in the GoU and a desire to coordinate donor activity in order not to duplicate effort or pay for certain work more than once. The lack of access to policy makers is understandable from the sense of GoU sovereignty and busyness of top administrators. On the other hand, not having a coordinating unit with authorized spokesmen for informal discussions with donors and their major contractors may be limiting progress in water sector reform.

40. This TA was developed with support from a previous Deputy Minister for MAWR, Mr. A. Djajalov, who during his long tenure in that post engineered a major change in the administration of water organizations from a purely Soviet style administrative basis to hydrographic basin basis by 2003. He was called up to take governor leadership in Syrdarya Province (which has major water-logging and salinity problems) in 2005. His replacement Mr.

Sh. Khamraev took over as Executing Agency (EA) Project Director for this TA after the Consultant and his proposed slate of international and local specialists had been previously approved by ADB. The Project Director's background is in Operations and Management of the large Bukhara province water system.

41. At the time of this writing (completion of the TA as envisioned) the average age of the 4 local specialists first proposed by the Consultant is 64.5. Two of the four proposed specialists spent most of their career in irrigation research and all were well acquainted with the Soviet style of centralized planning and response to top down management. All had significant experience with the same irrigation research organization, one of the very few local organizational players in the last 15 years of international partnerships in water in Uzbekistan. This background on proposed staffing is significant in view of how the TA first unfolded.

42. This TA was envisioned to complement the main loan project with the objective of assisting the GoU in developing and carrying out policy and institutional reforms in the water sector through (i) support at the national level to enhance MAWR's policy development capacity and prepare key policy and strategy documents on cost recovery and WUA development; and (ii) support at the basin and provincial levels to develop detailed operational procedures for the newly established Amu-Surkhan Basin Irrigation Organization (ASBIO), strengthen its water management and planning capacities, implement cost recovery policy, introduce water delivery fees, and promote WUA development in Sukhandarya Province.

43. This lengthy introduction to this section frames the background to this Technical Assistance (TA) project regarding the GoU's interest in receiving support to policy and institutional reforms in its water sector. It attempts to set the tone for why it seems to the Consultant that the GoU is mostly interested in water infrastructure rehabilitation and why and how the Consultant's attempts to fulfill its mission came out with mixed success.

B. Scope of Work

44. To advance ongoing reforms in the agriculture and water sectors, the TA was developed to promote several policy and institutional reform measures at the national level and institutional and technical measures at the Project (provincial) level. The most strategic task for the TA should have been to set up and strengthen a Water Sector Reform Support Unit (WSRSU) at the national MAWR level. The second most strategic task would have been to establish a Promotion and Coordinating Unit (PCU) at the Surkhandarya Province Agriculture and Water Department (SPAWD) level. With these units in place, further training of trainer activities and receiving feedback from government and WUA staff would be well focused. The most significant training activity envisioned in the TA was to support short term and degree courses for key staff of MAWR who would become leaders and trainers of water sector reform through the WSRSU and WUA development through the PCU at the provincial level. A plethora of detailed tasks were to be accomplished in a wide variety of disciplines. This exhaustive list of tasks without an apparent strategic priority basis appeared to come out of a review of the ADB WUA Guidebooks or similar manual. The TA was to be completed in 18 months.

45. For an excellent background discussion on recent agricultural reforms, the need for irrigation cost recovery, government subsidies and taxation, and legal aspects of chargeable water use, see Appendix XI.

C. Description of Project Area

I. Climatic Conditions

46. Surkhandarya Province is located at the extreme southern tip of Uzbekistan, just north of Turkmenistan and Afghanistan and west of Tajikistan (see inset map). To the north and east are foothills or mountains. Rivers flow and plains slope to the south where the Amudarya river flows to the west northwest. The climate is a semi-arid to arid continental – hot and dry in summers

and cool and dry in winters. Average annual precipitation ranges from 133 mm (5 inches) at Termez in the extreme south to 360 mm (14") at Denau (an irrigated area north of the Project area). Ninety percent of the annual precipitation occurs during winter and spring. Annual evaporation from a free water surface is more than 14 times the precipitation in Termez. The frost free period can exceed 262 days. June through August are the hottest months, with excesses of 50 degrees Celsius common in Termez.

II. Hydrology and Water Resources

47. The Surkhandarya river is the main natural water course in Surkhandarya Province. All river flow is diverted for irrigation, though the South-Surkhan dam and reservoir were constructed to capture spring runoff. Later the Amu-Zang canal was constructed to bring pumped water from the Amudarya river to this reservoir. It forms the north boundary of the Project. Collector drainage water from irrigation return flows upstream of the South Surkhan reservoir contributes significantly to water resources in the province. 97% of the surface water resources are used for irrigation. Groundwater salinity ranges from less than 1 g/l to 3 g/l and is used mostly for domestic and industrial purposes. Some groundwater is mixed with surface water to augment irrigation.

III. Soils

48. The majority of irrigable soils in Syrkhandarya are heavy loam seroziom soils formed out of loess deposits. Soil salinization is slight to medium, and has been increasing. Salt chemical composition is sulfate-chloride. Fertility has been declining due to naturally low organic matter content of this dry climate and continuous previous cotton monocropping.

IV. Major Crops

49. Total arable area in 2005 within the Project was 129,000 Ha. Major crops included small grains (42%), cotton (40%), forage (22%), vegetables and melons. No rain fed crops are grown in the Project area.

V. Irrigation Infrastructure

50. Construction of modern irrigation systems in the Province began in the early 1970's. Initially an Amudarya river pump station operated from 1972 to 1983. Then the present Amu-Zang canal pump station #1 was constructed with a lift of 34 meters. An Amu-Zang canal pump station #2 relifts to the Amu-Zang gravity canal as well as spills some water to the reregulating Aktepa reservoir. The Babatag pump station relieves a portion of Amu-Zang canal water which is conveyed further north to the South Surkhan reservoir on the Surkhandarya river. Presently the Project is constructing a set of desilting basins at the river pump station intake because of a very high (10 – 15 kg/m³) silt load which wears pump impellers significantly. There are over 1500 km of main and inter-farm canals in Surkhandarya Province, 47% of which are lined. Canal conveyance efficiencies range as low as 70%. On-farm canals and ditches in the Province are about 9 times this length, about 1/3 of which are lined. Inter-farm and ditch conveyance efficiencies can range as low as 50% In the Project area, 85% of the main canals are lined so conveyance efficiencies are higher.

VI. Drainage Infrastructure and Land Reclamation Status

51. The irrigated area of Surkhandarya Province is characterized by a large variety of hydrogeological and soil conditions, water availability and development degree. Therefore, there are a variety of drainage infrastructure features. 2/3 of the Project area has some kind of constructed drainage, 2/3 of that which is subsurface tile drainage. Observations on groundwater table depths, soil salinity and calculated water – salt balances would indicate that the irrigation water supply / on-farm irrigation management / drainage system are not adequate

to sustain the land in a healthy way. This has implications for the type of irrigation management, leaching or other soil melioration interventions and drainage system maintenance which must be provided for or by farmers to maintain irrigated farm sustainability.

D. Baseline Assessment of Water Management Institutions

52. The Amu-Surkhan Basin Irrigation Organization (ASBIO) operates and maintains the irrigation system infrastructure which delivers water to WUAs in the Project area. (See Appendix I-A). A variation of this particular organization has been in operation since the early 1970's and staff operate under fairly refined roles, even though its new clients are WUAs instead of collective farms. BIO organizations (of which there are 52 throughout Uzbekistan) are staffed mostly by water engineers and technicians who have always been a part of the former Ministry of Water Resources. The initial visit by the Consultant's Team Leader in September, 2005 laid a good foundation for future cooperation with the ASBIO and BIOs in other provinces.

53. The SPAWD is concerned mostly with agricultural production. (See Appendix I-B). Its staff include extension type specialists in various crops, "zoological technology" (animal husbandry and fisheries), soil fertility, agricultural mechanization and economics, as well as on-farm irrigation specialists. These specialists have all developed through the former Ministry of Agriculture. Because the national campaign on cotton harvesting was just starting at the time of the Consultant Team Leader's initial visit, the Head of SPAWD was only available to the Consultant Team leader very briefly. Perhaps the EA, Project Implementation Unit (PIU) and this Consultant never fully understood the role that SPAWD could and was supposed to play in the TA. Perhaps the TA was seen as a water infrastructure project. Unfortunately, there is no further record of discussion about or involvement of SPAWD staff in any TA workshop activities.

54. At the beginning of the TA, the EA Project Director selected 6 pilot WUAs from the Project area. Because mobilization of domestic specialists was delayed (to be discussed later), the baseline assessment of these WUAs was conducted coincidental with the workshops in July, 2006. In February, 2007 the EA Project Director selected an additional 12 emerging WUAs in 8 provinces (including 2 more WUAs in Surkhandarya region) to receive TA training through workshops. The managers of these WUAs were also surveyed. Most WUAs exhibited similar baseline characteristics in the following themes around which the questionnaires were developed (see WUA manager survey results in Appendix I-C.):

- Institutional: Training / Management
- Legal – Policy environment
- Technical: Infrastructure & Operations
- Economic - Finance

I. WUA Chairman Surveys

55. On the surface, it would appear that all surveyed WUAs had been well established, meeting the organizational norms which had been set down by the MAWR. The WUA boundaries had been agreed upon and accepted by local hakimiyat, rayvodhoz (district level MAWR organization) and liquidating commission for "Shirkats" (the organization which the collective farms had changed to and then further changed from to private farms). liquidating commission. The WUA constituent (forming) agreement and charter were registered with the local hakimiyat. An accounting and reporting system was in place, and some WUA accountants had already received training. A water service delivery contract between the Basin Irrigation Organization (BIO) and the WUA had been signed. The pilot WUAs had their bank account established, annual work plan developed and annual budget set down.

56. However, answers to other survey questions and discussions which emerged from the workshops indicated a number of deficiencies which were felt by the WUAs. This new organizational structure called WUA is composed of farmers, many of whom used to be farm

laborers. They feel inadequately trained and are either unaware of extension type service resources, or those don't exist. The workshops were therefore very warmly received by all WUA chairmen and farmers who participated. Nearly half of all WUAs surveyed were registered with the local "Hokimiyat" as commercial organizations with an initial tax liability of 3.5% of the value of inventory on their account. WUAs are not large in area or number of members, so they do not have the advantage of economies of scale or influence. Where a BIO used to deal with one collective farm of 10,000 Ha, for example, it must now deal with 10 or 15 smaller WUAs. This increases the workload for a BIO, and consequently only the "squeaky wheel gets the grease" (the WUA which shows up more often or complains the loudest). For the most part, land / water rights and irrigation / drainage infrastructure (and many times technical documentation such as maps, water distribution plans) have not been transferred to WUAs. Some of this is probably a reflection of the inadequacy of trained engineering staff in the WUA. Other reasons relate to who is perceived to be the owner of all means of production, which is a holdover from Soviet times. Only about ¼ of WUAs had received liquidated collective farm equipment which is reliable enough to maintain secondary canals and drains. In no cases did the WUAs feel that collected water service fees were anywhere near adequate to operate and maintain irrigation and drainage systems and build up a reserve fund. In fact, fee collections averaged only about 15 – 20% among the pilot WUAs.

III. PRINCIPAL ACTIVITIES OF THE TA

A. Consultants' TOR

57. Technical scopes of work for the Consultant team (Terms of Reference = TOR) were assigned by ADB for Team Leader / Water Management Specialist (international), Deputy Team Leader / Water Management Specialist (domestic), Legal and Institutional Development Specialists (international and domestic), WUA Development Specialist (domestic), Irrigation and Drainage Operations and Maintenance Specialist (domestic), and Training Specialist (international). These scopes of work are included in Appendix II. There are over 90 technical activities expected of the technical consultants in this TA. When adding in the technically non-productive activities of the Team Leader and Deputy Team Leader, this number leaps up to 130 separate activities. Since this TA is a Policy and Institutional Reform type of project, greater care should have been taken in selecting strategic TORs. These could have been identified and worked on as the TA would have unfolded if the TOR had envisioned a full time international Team Leader and if his team of consultants had assembled well. The consultants did address most of the TOR requirements. However, in the rush to fulfill all 90 tasks in the allotted time, the most strategic contributions of this TA or better quality analyses were overlooked. This deficiency in tackling the most strategic activities is attributed to the initial problems in mobilizing the domestic consultant staff (explained below) and apparent lack of buy-in for the TA by the EA from the start.

58. The Irrigation and Drainage O&M TOR was too broad in its scope. BIOs have been operating and maintaining canals and drains for 30 years. They have well trained staff and all normative documents in place. This TOR should have envisioned engaging BIO staff in training new WUA staff in the most important aspects of O&M. On-farm irrigation should have been the other part of this TOR, with extension type of training materials for farmers being the outcome (emphasis being on a farmer audience). Another deficiency in TOR scope is related to government cost recovery as a major TA objective. In this regard, it is most unfortunate that an economist position was not envisioned in the TOR. More discussion on TORs will follow.

B. TA Facilities

59. The TA was given a two room, 65 m² office and telephone landline on the 3rd floor of a building within the "Uzghiprovodkhoz" institute (Uzbekistan National Water Projects Design Institute). This was adequate in size and located conveniently, just upstairs from the PMO office and a 5 minute walk from the MAWR headquarters building.

60. Once the domestic consultant staffing issue had been resolved, the TA completed its purchase of all office furnishings and equipment, which will be turned over to the EA at the completion of the project as follows:

Quantity	Description
2	Laptop Computer
6	Desktop Computer
1	4 in 1 Machine (photocopier, printer, scanner, and fax)
3	File Cabinets
10	Chairs
7	Desks
2	Utility Tables
1	Safe
2	Sets of Drawers
1	Digital Camera
2	Telephone Set

C. Consultants' Mobilization

61. The TA mobilized the Deputy Team Leader (domestic consultant) in August 1, 2005. By August 19 the Team Leader (international consultant) had mobilized. Shortly after that, the EA Project Director stated that he wanted to replace all four of the domestic consultants that the ADB had approved for the TA. As explained earlier in the Introduction and Background section, this MAWR desire may be quite understandable. All four of the ADB approved domestic consultants were associated with an irrigation research organization which has received a lion's share of international project work in the past 15 years. Three of the four were past normal retirement age of 60. There is a significant difference between salaries for government employees and consultants associated with international projects, so these consultancies are a prize for individuals of any organization which lands them.

62. The EA advanced CV's to the ADB of 12 MAWR employees for consideration as replacements. The ADB concluded that they were not as qualified as the earlier approved consultants and that MAWR staff are not eligible to work as consultants. The Team Leader participated in 3 major meetings with the PMO Manager and / or ADB representatives over a 50 day period. ADB and MAWR held a number of meetings or exchanged correspondence on this issue which the Consultant was not a part of as well. The consultant learned that the EA even considered asking the Ministry of Finance to terminate the TA over this staffing problem. Item 7.3 Constraints in the Consultant's Bi-monthly Report for November, 2005, states "No progress in any activity is likely until the MAWR, ADB, and Consultant agree on the make-up of the local professional staff. The TA needs the Project Director's unqualified and active support to succeed". This issue was finally resolved through various compromises when International Project Services, Ltd (IPS), the local consultant in partnership with Louis Berger Group, Inc. (Consultant) withdrew from participation in the project and two of the four local consultants were replaced. But mobilization of these domestic consultants was delayed 4 months from initially planned.

63. This TA got off to a poor start because of the initial struggle over mobilization of domestic consultants. The Team Leader made a rapid 2 day assessment of the Project, meeting with numerous ASBIO staff, representatives of one pilot WUA and a couple of farmers. He revised the work program and manning schedule to reflect the 4 month delay in effective start to the project. With the Deputy Team Leader, he organized the TA office, recruited support staff and purchased the necessary office equipment. He contributed a courtesy review for ADB of what eventually came out as the six ADB WUA Guidebooks. He wrote the Consultant's Inception Report and first Bi-monthly Report. But unfortunately, he was not able to give much leadership to the initial formation of his team because all technical activities were on hold pending resolution of the mobilization of domestic consultants. (See Consultant's Bi-monthly

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Report through November, 2005 for a listing under 16 categories of “No activities took place during this reporting period.”). He left the country in mid-December, 2005 in agreement with ADB, having extended 1 month beyond initially planned.

64. The strains produced between MAWR, ADB and the Consultant at the start of the project had major implications for how the rest of the project proceeded, especially from a policy and institutional reform aspect. Rather than coordinate and work closely with policy makers, the Consultant generated much printed information in reports (a measurable requirement in the exhaustive TORs). On the other hand, workshops in the Project area and throughout the country generated much interest and enthusiasm from farmers, WUA chairmen and BIO managers. But that level is not where policy is developed.

65. Although two of the four original domestic consultants were retained, their effectiveness in coordinating with and relating to the PIU, ASBIO, SPAWD and WUAs was stymied because they never traveled to the Project site – the EA Project Director permitted only two consultants to participate in training activities in order to conserve funds. Therefore the former two worked on the written outputs for the project. The Deputy Team Leader met periodically with PMO staff to coordinate training and other activities. In retrospect, it seems that an intervention in conflict resolution and finding a win-win conclusion in the Asian context by ADB might have been invaluable to getting the project off to a better start.

66. International Specialists mobilization table:

Name	Position	Mob- lized	Demob- lized	Total staff- month	Used	Avail- Able
Juan Jose Gonzalez	Team Leader / Water Mgmt Specialist	19.08.2005		3	3	0
Gary Rose	Training Specialist	16.10.2006	21.01.2007	3	3	0
Dr Ibrahim Mammadzadeh	Legal & Institutional Expert (with economics expertise)	Planned for 01.09.05; Unavailable when domestic counterpart finally was mobilized		3		
Dale Henry	WUA & Institutional Specialist	16.02.2007	21.04.2007	3	2	1
Juan Jose Gonzalez	Unallocated			0.5		0.5

67. Domestic Specialists mobilization table:

Name	Position	Mob- lized	Demob- lized	Total Staff- month	Used¹	Avail- Able
Albert Shapiro	Deputy Team Leader	01.08.2005		19,5	22,5	0
Ashikmamut Ibraymov	WUA Specialist	03.01.2006	01.05.07	10	13	0
Khaldar Yakubov	Irrigation & Drainage O&M Specialist	03.01.2006	01.07.06	6	6	0

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Normukhammad Sheraliev	Legal Specialist	23.01.2006	01.05.07	10	13	0
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68. Administrative Staff mobilization table:

Name	Position	Mobilized	Demobilized	Total Staff-month	Used	Available
Masuda Tursunova	Office Manager	25.08.2005	01.11.2006	18	13	5
Abdukadir Kobilov	Office Manager	01.11.2006		10	10	0
Irina Shapiro	Translator	15.09.2005		18	22	0
Kamoliddin Norpulatov	Driver	23.08.05	16.11.05	18	3	0
Emil Popov	Driver	16.11.2005		16	20	0
A Kobilov	Accountant	15.09.2005	01.11.2006	18	7	11

¹ Used greater than Total indicates the difference that LBG carried on its overhead based on reasonable assurances from ADB URM and a commitment to keep the project going.

D. Official Meetings

69. The following table shows the official meetings with staff at higher levels in the Project and ADB. Many more informal discussions were held by domestic consultants with national MAWR, BIO, WUA and bank personnel during workshops, field demonstrations of model weir construction and operations, and workshop lunches for participants. The results of these discussions will be presented later. A good ongoing dialogue between the Deputy Team Leader and ADB URM continued through email and phone calls. Other than one meeting on October 21, 2005, there is no record of any further tri-partite meetings. In view of the expected coordination required of such a national policy and institutional reform project, this is most unfortunate. More formal meetings, especially at the Mid Project time might have helped the Consultant and EA make mid-course changes in trajectory to insure a more favorable TA outcome.

70. The following table presents a summary of the major TA meetings:

Date	Consultant's Staff	Person Visited	Person's Position	Result of the Meeting
8-9 Sep 05	Team Leader	Bozar Khannazarov Tojimurod Mamaraimov Pardahon Djuraev	Deputy, ASBIO Head, SPAWD Hokim, Muzrabad Dist, Surkhandarya Province	Explained TA objectives
	Team Leader (TL), Deputy TL	Shavkhat Khamraev	EA Project Director	Discussed IPS domestic consultants
3 Aug 06	Deputy TL, WUA Dev. consultant, Legal consultant	Bahodir Murzaev A Khuzhakulov	PMO Training Coordinators	Communicated & compared Project & TA training plans

E. Contract Variations

71. The following table presents a summary of the 5 contract variations which were proposed by the Consultant and their impact on the TA.

No.	Action	Date LBG submit -ted	Date ADB res-ponded	Approved ?	Impact on TA Implementation
1	Replace training specialist (international) Mark Crocker with Victor Gillespie (note: Gary Rose approved & mobilized by 16.10.06)	03.10.06	10.10.06	Yes	6.5 month delay due to No. 2 contract variation made it difficult to mobilize training specialist. Therefore, initial pilot WUA training occurred without input from any training specialist.
2	Replace domestic specialists M. Pinkhasov with A. Ibraymov and Yu. Rysbekov with N.Sheraliev.	11.03.06	18.01.06	Yes	Negative – this change initiated by EA effectively delayed project start by 6.5 months; Positive – resolution after months of discussions enabled project to finally start
3	Extend domestic WUA Development & Legal specialists by 4 mo. For additional WUA training, spring 07	05.10.06	14.12.06	Yes	Mixed – set up foregone precedent for continued WUA training by locals instead of training of trainers abroad for the WRSRU and PCU as first envisioned in TA.
4	Replace international Legal & Institutional (& Economic) expert Dr. Ibrahim Mamadzadeh with WUA & Institutional specialist Dale Henry for 2 mo.	10.02.07	13.04.07	Yes	Positive - Allowed qualified native English speaker to provide inputs for Final Report; Negative – due to slow project start and unavailability of initially proposed expert, this mobilization came 18 months after initially planned and just 6 weeks before the planned completion of the TA so there was effectively no new international input to the legal, institutional & economic aspects of the TA
5	Extend TA for 3 months; Conduct 12 WUA & 1 national workshops in 8 provinces of Uzbekistan; install	02.07	05.07	No	Negative – Consultant incurred substantial expenses to extend project as requested by EA and supported by URM ADB; Positive – response from

	12 model weirs at outlet to WUAs.				field practitioners.at BIO and WUA level was very enthusiastic and helps advance WUA development concepts throughout the country
	Courtesy review of ADB's 6 Guidebooks for Water User's Associations in Uzbekistan			At ADB URM request	Positive – contributed to the development of a first ever united effort on WUA materials by international project partners in Central Asia
	Courtesy assembly & publication of Photo Album of Major Hydraulic Structures in Uzbekistan (in English, Russian & Uzbek languages)			At EA Project Director's request	Positive – showcases Uzbekistan's water infrastructure as a modern engineering miracle to an international audience
	Courtesy distribution of freeware macro spreadsheet software on water use planning to WUAs at workshops				Positive – places resources developed by international partnerships in the hands of practitioners and saves 3 months of laborious calculations on estimating crop water demands and water distribution plans

F. Consultations and Field Visits

72. The Consultant's international Team Leader / Water Management Specialist Juan Jose Gonzalez contributed significantly as a consultant in reviewing what eventually became the six ADB WUA Guidebooks (published August, 2006). Many portions of material from these guidebooks were extracted by some of the Consultant's domestic specialists for TA inputs. This tendency of borrowing from previously developed material without synthesizing is not uncommon and may be quite understandable in a region where English is not even a major trade or educational language. The workshops, which would count as consultations and field visits, are discussed in a following section.

G. Consultants' Inputs

I. Team Leader / Water Management Specialist (International)

73. The international Team Leader, Juan Jose Gonzalez made inputs as already discussed in paragraphs 63 and 72 above.

II. Deputy Team Leader / Water Management Specialist (Domestic)

74. Deputy Team Leader Albert Shapiro provided TA leadership in country, participated in developing the overall plan of action, coordinated the activities of the domestic specialists, contributed to several sections of the reports, evaluated and accepted reports from the specialists, coordinated activities with MAWR and the Project, helped develop WUA chairmen and farmer questionnaires and organized training activities, and edited reports. His understanding of local government culture and encouragement kept the TA on track, with all reports submitted on time.

75. The domestic consultants provided written inputs which were translated into English or Russian as needed by the TA. All of these sections were included in one or more TA Reports, but now are gathered together in chapters and included as hard copies in Volume II Appendices in the following sections, with their major author:

- III. WATER AND LAND LEGISLATION IN UZBEKISTAN – N.Sheraliev, A. Shapiro
- IV. WUA FORMATION AND DEVELOPMENT – A. Ibraymov & A. Shapiro
- V. CHARGING FOR WATER IN UZBEKISTAN – A.Ibraymov & A. Shapiro
- VI. WUA WATER ACCOUNTING - A. Ibraymov
- VII. IRRIGATION AND DRAINAGE SYSTEM O&M – K. Yakubov
- VIII. PHOTO ALBUM OF MAJOR HYDRAULIC STRUCTURES IN UZBEKISTAN – A. Ibraymov, N.Sheraliev, A. Shapiro

III. WUA Development Specialist (Domestic)

76. Domestic WUA Development Specialist Ashikmamut Ibraymov was responsible for development of basic documents on WUA formation and development, transition to chargeable water use and training of MAWR staff, WUA chairmen and farmers. He was very warmly received and respected by workshop participants because of his broad experience in water operations and maintenance which he has gained from 20 years experience with the MAWR in Kungrad district of Karakalpakstan, 8 years with MAWR in Tashkent and study tours abroad in Moscow, Ukraine, Israel, USA, Italy and Sicily.

IV. Legal Specialist (Domestic)

77. Domestic Legal Specialist Normukhammad Sheraliev was responsible for analyzing national legislation regarding WUA and developing recommendations on the legal base of WUA formation and functioning. He contributed significantly in the workshop training of MAWR staff, WUA chairmen and farmers.

V. Irrigation and Drainage O&M Specialist (Domestic)

78. According to his TOR, domestic Irrigation and Drainage O&M Specialist Khaldar Yakubov very well completed all of his responsibilities for developing the Project area norms for irrigation, leaching and return flow withdrawal, recommending furrow irrigation and leaching methods, recommending procedures for inter-farm and on-farm irrigation and drainage infrastructure O&M, developing rational water use planning me and distribution methods for secondary water users. Unfortunately, as mentioned previously, his TOR was not completely appropriate to TA needs. His written presentations were extracted from research reports in Soviet times, are full of theory, and do not meet the need of most field practitioners or farmers. The EA Project Director therefore did not invite him to participate in workshop presentations.

VI. Training Specialist (International)

79. International Training Specialist Gary Rose primarily wrote the December 2006 – January 2007 Consultant's Bimonthly Report. He introduced various institutional options for providing irrigation services. He developed a Required Capacity Development and Training Needs Matrix Assessment for three levels of participants: I – Cabinet of Ministers (CabMin). Parliament and MAWR policymakers, II national MAWR managers and III provincial and BIO and WUA managers. Unfortunately, this very appropriate training input came 11 months after his position was supposed to have been mobilized. It was too late – the first set of training workshops had been implemented 4 months before, and the EA apparently had begun thinking about extending that training throughout the country for a second set of popular workshops.

80. In a very short time and over the international Christmas holiday when many universities in the West are closed, Mr. Rose did an excellent job of requesting bids for short term overseas training, evaluating the replies based on 4 criteria and recommending an Australian international water training center to provide training for 5 MAWR senior training specialists for overseas training within a two week period in early 2007. His training needs matrix provided a major basis for TA conclusions and recommendations to be presented later.

VII. WUA and Institutional Specialist (International)

81 International WUA and Institutional Specialist Dale Henry mobilized at the end of the project. He contributed to the analysis of previous TA activities and writing and editing of the Final Report.

H. Workshops

82. 19 workshops which were conducted – 1 at the ASBIO level, 5 in pilot WUA's in the Project area, 12 emerging WUAs among 8 provinces, and 1 national MAWR level closing workshop. Appendix I-D presents a Summary of the Workshop statistics, including numbers of people and types of training. Participation from BIOs was quite strong (usually 3 – 4 staff at each workshop, totaling over 60). Often the materials on infrastructure O&M, water measurement and water distribution to secondary users were presented by BIO staff. This is a good example of coordination with the PIU. Over 170 Chairmen or Deputy Chairmen of WUAs attended the workshops, of which more than 40 were from the pilot WUAs. About 340 farmers from pilot WUAs completed a 21 question farmer survey and about 100 farmers participated in the Workshop trainings.

83. The training was centered around the following themes about which the WUA Chairmen

- Institutional: Management
- Legal environment
- Technical: Infrastructure & Operations

It appeared from agenda notes that the Economic – Finance aspects of water reform were not presented in much detail, though sometimes those issues received questions and ensuing discussion from WUA chairmen.

I. Summary of Discussions and Recommendations at Conclusion of Workshops

84. Minutes, photos and recommendations of all workshops were included in the September, 2006 and May, 2007 Consultant's Bimonthly Reports. A summary of the discussions and recommendations from WUA chairmen is found in Appendix I-E, distributed among the framework categories of Policy, Legal, Institutional, Technical and Finance. The column widths in the table are proportionate to the number of recommendations in any category.

85. It is encouraging to note in this survey of institutional chiefs that the institutional issues received the most attention. Of these, training was the greatest felt need, being mentioned in 10 of the 18 WUA sessions. General WUA support, specific courses on design, construction and operation of water measuring devices as well as loan applications for accountants were mentioned. Other institutional issues included networking with one another in the WUA sphere and educating the public about the value and cost of water. A final institutional subtopic was more technical in nature and would generally be carried out by planning staff of a water organization. This subtopic concerned development of water use plans and secondary canal rotation schedules as well as giving special attention to the pumped water users for whom the WUAs needed to pay more for electricity.

86. The next priority area for the WUAs appears to be in the Financial category. Issues which received the greatest attention included becoming exempt from paying property taxes as a non-commercial, non-governmental organization, being properly reimbursed for pumping water for state-ordered (SO) cotton and wheat production and taking advantage of \$350 million in cash flow loans to farmers for production inputs in 2007 for cotton and wheat.

87. Legal areas rounded out the WUA chairmen interests. As a result of what they learned, more than half of the WUAs planned to re-register with provincial Ministry of Justice departments as non-commercial, non-governmental organizations in order to receive tax exemptions on property tax (3.5%) and to get out from under any direct authority by District "Hokimiyats". Other legal issues concerned giving adequate attention to and strengthening the bargaining position of the WUAs in developing legal agreements, especially with BIOs.

88. Technical areas in Infrastructure and Operations received some attention. The need for rehabilitating canal turnout gates and installing measuring devices was often cited. Developing an inventory of structures and waterways, their book value and connecting that with what was and was not transferred to the WUA seemed to be important. Settling this issue of who owns what was the only Policy issue that seemed to get the attention of WUA chairmen. The Consultant noted that WUAs are seeming to replace private farmers associations as the next quasi-public organization to be a government vehicle for delivering goods and services to farmers while maintaining its SO policies on cotton and wheat production.

I. Farmer Survey Results

89. 340 farmers (97% of whom were irrigation customers) from the 6 pilot WUAs completed a 21 question survey form. The only differences in compared results across organizations were that only 1 of the 6 WUAs did not charge for water, and there were some differences in the payment methods. An overwhelming majority of farmers spend less than 10% of their gross crop income for water use. The majority of farmers receive their water on a rotation (turn) basis with the right amount of water being measured and delivered on time. About 25% of farmers received only 75% of their volume and half the time not in a timely manner. Inadequacies of the infrastructure were blamed half the time for poor deliveries, but a significant minority (nearly 40%) felt that the rotation system was poorly arranged. If everyone participated, the farmers felt that they could take responsibility for distributing and policing the water on secondary systems. Only 31% of farmers would pay to install measuring devices – the others wanted government assistance.

J. Coordinating TA and Project Training Activities

90. The TA consultant team of Deputy Team Leader and 2 workshop trainers met with 2 PMO training coordinators in early August 2006 (see Consultant's Bi-monthly Report November 2006 for minutes). Besides sharing information, the most important outcome of this meeting was a commitment by both parties to involve PIU and ASBIO staff in the TA trainings. The active leadership role of BIO staff in presenting one of the three TA workshop sessions at each workshop has been noted above.

91. The Consultant's International Training Specialist reviewed the Project's Training Activities which were made available to him in late Fall, 2006 (See Appendix I-G). The Project Training envisioned training of full time trainers for the Project life, conducting awareness seminars at all levels in the province, private farm development which included agricultural service center support and farming techniques, 7 different levels of WUA training (including 4 on finance topics), and main canal system management for BIOs and MAWR staff. The Project training objectives were to be deeper, broader, overlapping in content and coming after the TA training of pilot WUAs. In this regard, the TA training activities helped jump start interest in the pilot WUAs so that later Project training would be very effective.

92. The Project training budget was also greater than that of the TA's when it came to support for out-of-country training. The Project envisioned at a later time (2007 – 08) sending 12 MAWR, ASBIO and pilot WUA leaders for 15 days to one developing country nearby and two developed countries. This is in contrast to the TA training which was envisioned for just 5 MAWR staff to go to a developed country for the same time period.

K. Reports

93. The Consultant generated 14 official reports totaling over 900 pages, available 6 copies at a time in both English and Russian. Two unofficial reviews or reports as a courtesy to ADB URM or MAWR were developed. In addition, 6 sets of compiled materials in Russian were handed out at pilot WUAs. In the case of missing the forest for the trees, its unfortunate that the TA required so many reports from such exhaustive TORs. As explained previously, it seems that information was substituted for dialogue with MAWR policy makers.

94. But MAWR policy makers are also busy providing services to an industry which engages one third of the Uzbekistan working force. They are simply not available to small projects such as this TA. The lack of written comments from MAWR or ADB on TA Bi-monthly Reports led the Consultant to believe that project progress and reporting was adequate.

A list of the TA reports is presented below.

No.	Title	Date	International Consultants	Domestic Consultants
1	Inception	19 Sep, 05	X	
	Review of Draft "Irrigation Management Transfer in Central Asia: Roles of Water User Associations"	Courtesy to ADB	X	
2	Bi-monthly through Nov 05	9 Dec, 05	X	
3	Bi-monthly, Jan 06	9 Feb, 06		X
4	Bi-monthly, Mar 06	7 Apr, 06		X
5	Midterm, May 06	9 Jun, 06		X
6	Collection of Materials on Water User Associations Formation and Sustainable Functioning	Distributed at pilot WUA workshops Jul 06		X
7	Bi-monthly, Jul 06	5 Aug, 06		X
8	Bi-monthly, Sep 06	10 Oct, 06		X
9	International Training Short Course Development Proposal	1 Dec, 06	X	
10	Bi-monthly, Nov 06	10 Dec, 06		X
11	Bi-monthly, Jan 07	5 Feb, 07	X (training)	
12	Bi-monthly, Mar 07	10 Apr, 07		X

	Photo Album of Major Hydraulic Structures in Uzbekistan	Courtesy to MAWR & ADB	X
13	Bi-monthly, May 07	12 Jun, 07	X
14	Draft Final, Jun 07	12 Jun, 07	X
15	Final, Aug 07	4 Sep, 07	X

IV. OUTCOME OF THE TECHNICAL ASSISTANCE

A. Achieving the TA Objectives

95. As mentioned previously, the TA envisioned (i) support at the national level to enhance MAWR's policy development capacity and prepare key policy and strategy documents on cost recovery and WUA development; and (ii) support at the basin and provincial levels to develop detailed operational procedures for the newly established Amu-Surkhan Basin Irrigation Organization (ASBIO), strengthen its water management and planning capacities, implement cost recovery policy, introduce water delivery fees, and promote WUA development in Sukhandarya Province.

96. It is important to keep in mind in this TA what the word support entails. It assumes that there is a commitment at the national and basin / provincial level to receive Consultant inputs and dialogue together. Support at the basin / provincial level was limited to excellent workshop participation by ASBIO and WUA personnel. As mentioned previously, the SPAWD organization was left out of this dialogue.

97. Receiving support then at the national level should have been where the TA concentrated its efforts. But the poor start of the TA at that level effectively precluded this.

98. The 90+ technical line items in the TORs were grouped into 15 technical activities in the Consultant's winning proposal. Those are presented in Table 1, further grouped into Policy, Legal, Economic – Financial, Institutional, or Technical framework categories.

99. A glance at Table 1 shows that only 5 of the 15 tasks identified by the Consultant were fully accomplished (green). The basis for this assessment can be found from an analysis of planned deliverables (introduced later in this report) - all the written inputs which were developed by 3 domestic and 1 international consultants. 8 tasks were halfway accomplished (blue and purple). Most of these are related to overlaps with the Project. Cost recovery fee studies (yellow) were not performed because no economist consultant was envisioned in TORs and the one international consultant with economics background could not be mobilized.

100. Degree programs abroad would be excellent for developing capacity to sustain long term reforms in the water sector. The candidates most suited for such programs would be mid-level managers in their mid thirties who already have English proficiency and international training experience. MSc's in Public Administration from an excellent Water Resources university would be the best direction to pursue. There are a number of younger Uzbek engineers or economists who have graduated from the Tashkent Institute of Irrigation and Melioration (TIIM) or from other disciplines at other universities who have studied abroad with or without GoU scholarship assistance or who have worked with international projects who might be suitable candidates. But the GoU would need to reform its recruiting and retention policy to attract and groom this talent pool for future management. At the present time no ADB budget was included for degree programs so this task was not pursued by the TA.

101. Task 4 (Setup & strengthen MAWR Water Sector Reform Support Unit), Task 6 (Advise government on long term reform policy & investment strategies) and Task 13 (Setup SPAWD

WUA Promotion and Coordinating Unit) were the most strategic tasks identified by the Consultant in its winning technical proposal. Unfortunately these tasks were the least completed of all Consultant activities. It appears that the EA was not so interested in the TA and that the Consultant did not pursue dialogue with the EA, based on the rough start of the TA which has been detailed previously. In addition, the Team Leader's limited time in-country was taken up mostly by that initially unresolved staffing problem.

102. The exhaustiveness of TORs which seemed to be taken out of an IWRM and WUA type manual should have been proposed for overhaul or strategically prioritized in the beginning by the Consultant during his initial visit. Ideally a contract variation might have been proposed which would have allowed a full time international Team Leader and a senior staff from the MAWR who had access to policy makers to be dedicated exclusively to the TA. Priorities could have been better developed with input from key MAWR staff. This would have improved cooperation, engaged the MAWR in setting its agenda for reform (taking advantage of the Project training opportunities) and enabled the TA to complete its most strategic mission of influencing policy at the highest MAWR level. Then the ensuing staffing issue might have solved itself.

103. Task 8 Organize MAWR Study Tour abroad was fully completed by the Consultant (Consultant's Bi-monthly Report January, 2007). Unfortunately, the EA chose to spend \$70,000 of grant money in-country rather than invest \$65,000 out of country where the eyes of key MAWR staff trainers for the WSRSU and PCU could be opened wider. It is quite well known in development circles that short term exposure abroad of mid-level management professionals to other ways of thinking is one of the best training investments which can be made. The short term gain of exposing many new WUA chairmen to a one time workshop on WUA legal basis, formation and sustaining and installation of one water measuring device was traded for the long term gain of investing in a water reform working group / trainers cadre. Applications from interested candidates for these training slots could have come from the Project ASBIO or SPAWD staff, MAWR staff experienced in water management, the talent pool mentioned in para. 99 above or even from the Consultant's WUA specialist (former MAWR staff).

B. Main Work Plan Tasks and Activities

104. The Consultant most of the items listed in the TORs. They are presented in the Appendix chapters III through VII.

C. Progress towards Planned Deliverables

105. The TORs were reduced to a completion of planned deliverables (see Appendix X). Some of the deliverables envisioned drafting laws and a future water code, which is not at all realistic given the scope of the TA, the limited time frame and lack of access by a water lobby to lawmakers. Appendix X formed the basis for Table 1 referred to earlier.

I. Training Needs Survey and Training Tasks Identified by TA and Project

106. Table 2 lists training activities which were identified from the TA and Project training needs surveys. The heading identifies who is in which of 3 levels. Colored cells show which training activities were consequently conducted or materials prepared by the TA or training planned by the Project.

107. A quick review from the bottom of the table up reveals that training is fairly comprehensive and well received at the provincial / basin level (I). This includes Farm Management, Technical and WUA Institutional development and management of O&M and Finances. Training in cost recovery economics at any level is lacking. Field practitioners (level I) and MAWR managers (levels II and I) have been exposed to legal issues. But lawmakers at level I have not been engaged. This will be addressed later. Public relations campaigns by the PIU are intended to target all three levels. Although training needs have been identified at the top level (Presidential apparatus, Cabinet of

Ministers, Parliament) neither the TA nor the Project have conducted any training. It is obvious that to get attention of these kinds of people would take a better coordinated effort of all water reform donors, MAWR and the development of a proper Water Lobby (to be discussed later).

108. Very significant Human Resources (HR) training at the II and III levels of Institutional formation has been identified but not conducted. This is easily seen from all the white space in the bottom half of page 2 and top half of page 3 of the table. Since under 40 year old mid-level managers at these levels have their major years of influence just ahead of them, this is the best place to introduce major investments in capacity building training if one has a long term view of reform in mind.

109. As a less expensive alternative to outside country study tours, the MAWR and major donors might consider setting up tours of existing pilot WUA projects in the Fergana Valley, Khorezm province and Karakalpakistan. Such training exposure should include objectively moderated discussion forums. These tours could lead to cross-provincial internships for key trainers.

V. FINDINGS

A. International Criteria for Judging Reform Success

110. In order to better assess the capacity and interest of the GoU and MAWR to carry out water sector reforms such as IWRM / PIM / IMT and WUA development, it may be instructive here to highlight criteria for success from other consultants, World Bank, and IWMI – most of which were highlighted in the international Training Specialist’s completion report to the Consultant.

111. Table 3 presents several international criteria for judging the effectiveness of Uzbekistan’s approach to water sector reform. The Strengths – Weaknesses – Opportunities – Threats (SWOT) technique in issues matrix analysis is best used while brainstorming together in a small group where each opinion counts and the group can do a better job of identifying the issues and classifying them by SWOT.

112. Nevertheless, we can make some major observations:

- While threats and opportunities are nearly balanced in number, weaknesses outnumber strengths by 5 times. Without major changes in leadership approach to water reform at the higher levels, there will be no reform.
- The effort required to mitigate against threats and to take advantage of opportunities seems overwhelming for a post-Soviet bureaucracy where initiative has not usually been rewarded. Only inspired leadership will be able to motivate the “what if” thinkers to overcome the inertia of business as usual.
- Of the areas of weakness, several stand out which should be highlighted:
 - Clear, high level support for reform is needed. Lack of dialogue with the EA in general and in specific about setting up the WSRSU or PCU, along with rejection of the Consultant’s TOR proposal of a study tour abroad for key WSRSU and PCU trainers were all indications of lack of interest at the top.
 - The amount of detailed and informed effort required by lawmakers and a water lobby of concerned stakeholders (which does not exist) to establish a strong legal base for IWRM at this time in Uzbekistan’s history is also overwhelming. Threats in the legal arena affect every sector in Uzbekistan and unless neutralized, will defeat any national water reform efforts.
 - The priority of engaging reform at all levels prior to major rehabilitation of infrastructure is just opposite of current government policy which is supported by major donors. The TA’s relating to reform are a free “carrot” attachment to an infrastructure loan.
 - A systems approach to reform in all framework categories implies a number of professionals with different backgrounds being assigned to lead the reform effort. This group has apparently not been recruited and tasked by MAWR leadership.
 - Shared vision, broad communications / public relations plan with feedback mechanisms and high expectations of autonomy / transparency / accountability implies an

atmosphere of full participation by all stakeholders – which seems quite foreign in most locals experiences.

- Establishment of an enabling environment for WUA development almost implies a kind of tenderness, mothering instinct in allowing these new institutions to grow up and stand on their feet. Unfortunately, there are few illustrations in Central Asia of consistent nurturing being directed in the formation of any new institution or business sector.
- The following strengths must be used to advantage by reform adherents:
 - Most BIOs and WUAs have been organized on a hydrographic basis. Networking within an area of common physical – infrastructure issues can help find quicker consensus.
 - This Asian culture is strong in collective action. If Farmers can be encouraged to come together under their own informal change agent leadership, they could overcome many obstacles in taking charge for their own system finance and O&M.

B. Summary of Findings from TA Inputs

113. The following findings are presented against the backdrop of key water sector reform factors: policy, legal, economics and finance, institutional and technical. These factors have filtered up from a review of the Consultant Specialist conclusions and Table 2 on training needs assessments and training conducted by the TA and Project. An introductory question introduces each section.

I. Policy Environment

Policy Environment: to what extent are the GoU's agricultural sector / water management policies appropriate to address all issues at hand and what reform elements need to be accelerated or new elements introduced?

114. WUAs are intended to be autonomous, self-governing and financially independent non-commercial, non-governmental organizations whose farmer stakeholders feel like owners and will take care of the water distribution system which affects their livelihoods.

115. The overarching state-ordered wheat and cotton commodity policy is carried out through the Presidential-appointed provincial governors and their appointed district governors. It is extremely difficult to introduce market reforms even in pilot experiments such as WUA formation when the provincial leader is obligated to motivate his farmers to meet the state plan goals.

116. During Uzbekistan's 16 year transition to a market economy, many structural changes have taken place at least in name. Collective farms became "Shirkat" collectives which have now been privatized with 50 year leases of 50 Ha plots awarded to private farmers, often through a competitive tendering process. That process is intended to follow objective criteria for selecting leases..... but it is well known that some district "Hokims" circumvent the competitive and open process for personal gain.

117. At this time, there is some concern that the MAWR might view WUAs as a replacement vehicle for quasi-government Private Farmer Associations. This is indicated by the pace of government-mandated WUA formation and registration with "Hokimiyats" and district MAWR offices, using WUAs to apply for operating credit loans for farm inputs for cotton and wheat starting spring, 2007, and discussions somewhere about Federations of WUAs providing ancillary support such as agro-processing, input supply, marketing and advisory services. WUAs need to remain focused on delivering water to farmers through a safe and secure infrastructure system on a sustainable basis for a reasonable price.

118. WUAs need to be free from government control. They should form and register their documents with provincial Ministry of Justice authorities as non-commercial, non-governmental organizations with tax free privileges. As certain language is removed from the model WUA formation and charter documents (such as establishing WUAs "in agreement with" and

“according to the recommendations of” or requiring the WUA chairman to be appointed by the district MAWR, or requiring approval of water use plans by the district “Hokimyat”), WUAs will stand on their feet as respected partners in dialogue and reform implementation.

119. According to the World Bank-funded Drainage, Irrigation and Wetlands Improvement Project (DIWP), what WUAs need from these district and provincial “Hokims” is:

- their involvement in facilitating WUA development
 - including payment of electrical bills for WUAs pumping to cotton and wheat cropland according to December, 2003 statutes
 - by improving the timing and amount of payment to farmers for cotton and wheat deliveries (the final 20% of cotton payment can be delayed up to 9 months or not at all)
 - by improving supply of agricultural inputs to farmers
 - by their assistance in transferring equipment of former “Shirkats” to WUAs
 - by their assistance in provision of offices, equipment and communication facilities to WUAs

120. There are some bright spots in several regions where provincial and district governors have been consistently invited to WUA trainings and seminars and advocated on behalf of emerging WUAs for government resources (most notably in the Fergana Valley, Khorezm province and Karakalpakistan).

121. A study of 121 World Bank water projects discovered that those where women had a greater role in decision-making had higher quality and more sustainable outcomes. Perhaps more attention at top policy levels ought to be considered for increasing the role and leadership opportunities for women in water resources management. One reason for this may be the innate sense of fairness and empathy that women have for the marginalized and disenfranchised. Another reason could be related to the enabling environment required for successful PIM, which is described in the WUA literature with words like *survive, grow, prosper, thrive, nurtured, supported, empowered* – words which describe a woman’s natural mothering instincts.

122. If reform is to come in the water sector, a leader / reform catalyst to serve as chief for the Water Sector Reform Support Unit may well have to come from outside of the MAWR. Not from outside of understanding rural Uzbeks and the farm life. But from someone who has not had a career in the organization and whose reform mandate is coming from higher up. The reason is that a new paradigm shift is required. This organization and its present management came into its heyday in the 1960’s to 1980’s when the massive irrigation and drainage infrastructure in Central Asia was exploding with activity. But now those same design / construction and hydraulic management skills may not be as needed as at former times. Managers gifted in human resource skills to cast vision, serve the client base and diplomatically balance competing demands are needed as the MAWR reorients itself to build institutional capacity, provide WUA support to WUAs and FWs, and regulate the water sector.

123. Besides a reformer posted to or very near the top of MAWR, it and the GoU in general really need the active participation of a full set of stakeholders in the development of its reform policies in water management. This includes the private sector, communities such as a national association of “mahalla” committees, educators and the non-governmental organization sector (NGO). NGOs should not be viewed as competitors or agitators. History shows that monopolies sooner or later collapse because they don’t allow competition to sharpen their service delivery and attention to the consumer of their products.

124. If a natural resources or water lobby were encouraged to develop, stakeholder voices would eventually make their way to be heard among the lawmakers. Non-lawmaker specialists would be invited to testify at subcommittee hearings and even provide written comments on draft legislation. With more participation by this sector in drafting policies and laws, a greater

accountability for the role public servants (government workers) make would inch itself forward through accurate and fair reporting in the media.

II. Legal Environment

Legal Environment - conducive or not and what should be done to improve it?

125. The legal and regulatory framework for the water sector in Uzbekistan is still in the formative stages. New legislative direction is often popularly associated with a general Presidential or CabMin decree and not the specific legislation or normative documents which are later worked out in detail. In addition, subsequent legislative review can reveal contradictions between proposed decrees and existing legislation which may not always be dealt with in order to meet decree deadlines. Consequently, uncertainty and confusion may not be an uncommon experience for the water user who is trying to ascertain his rights.

126. With regard to chargeable water use, it is important to review the “bitter” experience of nearby Kazakhstan. Chargeable water use was introduced there by decree in 1993 without a sufficient legal base. After 10 years of struggle, the Law Concerning “Rural Water Consumer’s Co-operatives” (RWCC) was adopted. Now water consumers could purchase property rights for water use, and public use canals previously privatized but poorly managed were returned to the RWCC. However, the adopted law is still insufficient and obliges water users to pay fees that are not sufficient to recover costs for the operation of those public use canals.

127. In 2002 the MAWR dedicated one staff person (the Consultant’s WUA Development Specialist) for over a year to develop model documents, regulations and proposed law which resulted in reorganization of the MAWR along hydrographic boundaries in the CabMin decision #290 on July 29, 2003. Further policy changes about chargeable water use, etc. came out in the CabMin decision #383 on September 4, 2003. During the MAWR preparation process, consultations with Parliament lawmakers revealed a complete lack of understanding of water resource principles among those charged to prepare legislation. A draft law on Water User Associations has apparently languished in a Parliament subcommittee since December 2004.

128. Consequently, there are currently multiplicity of poorly coordinated decrees, laws and regulations which can be conflicting at worst and confusing or vague at best. To disentangle the overlaps and fill the gaps will take a coordinated effort by a group of specialists who engage all the stakeholders in dialogue (and vice versa with the development of a Water Lobby) before overhauling the laws and assembling them into a modern, coordinated Water Code. The ADB already assembled much of this kind of legal input from a number of international and local specialists in the publishing of its 6 ADB WUA Guidebooks. Many of those specific points were reiterated in this TA.

129. This kind of input should not languish in a subcommittee for 3 years – “Water is Life” is a well known saying in Uzbekistan and this issue deserves greater attention for the sake of the Uzbek public. Detailed review, consideration and incorporation of these types of recommendations should be encouraged at the level of a lawmaking subcommittee or water lobby which has day to day access to such a subcommittee. Inclusion of this I level in a water legislation study tour abroad (to USA or Australia, for example) should still be a very high ADB priority.

130. This lack of depth in water resources understanding among level I lawmakers and a miscoordinated approach to developing water policy only from the executive branch side is a severe weakness, especially in the regional political arena (80% of Uzbekistan’s water resource use is formed upstream in other countries). The pressure for better management of Uzbekistan’s water resource base to serve a growing population as Afghanistan and Turkmenistan withdraw more water from the Amu Darya river system will only increase. Uzbekistan would be better served in the formation of its diplomatic corps by introducing training

in natural and water resources management as well as opening up / inviting into that corps personnel experienced and / or trained in resource management.

131. In the early years of this decade, The European Union Technical Assistance to Commonwealth of Independent States (EU-TACIS) supported studies within the State Committee for Land Management which eventually led on February 17, 2005 to a 51 page Land Code available on the web in Uzbek, Russian and English languages. A similar funded effort some years time with this goal in mind should be considered for a Water Code.

132. The state of California in the USA is similar in size to Uzbekistan, about double in population, and very similar in terms of climate and crops grown. It has a searchable Water Code on a website, the table of contents for which includes 55 pages with Divisions, Parts, Chapters and Articles. Each item in the table of contents is connected to a law of 1 to 7 pages in length. The entire code therefore encompasses perhaps as many as 5000 pages. So, developing a Water Code and having buy-in by all stakeholders is no small matter to be tacked onto a list of 90 TA tasks.

133. In addition to the comments in the Policy section above about WUAs being autonomous and outside the control of district “Hokimiyat” or MAWR in their formation and charter documents, the ability to form federations of WUAs or Canal Management Councils based upon mutual interests should be included in each WUA charter.

134. Regarding infrastructure, who owns what and who is responsible for what is a major policy item which needs to be clarified. A model transfer agreement has been developed to clarify which features (waterways, structures and pumps) are to be transferred from government to WUA O&M responsibility. This type of documentation is necessary before the WUA can take on a new responsibility. An accurate inventory of the infrastructure and its condition must be generated first by competent engineers and technicians. This inventory and associated maps and engineering drawings will serve as a documentation basis for further developing plans of work and cost estimates for rehabilitation. Included in these transfer agreements should also be land rights-of-way along waterways. If this is clarified on maps and registered, the party responsible for O&M will have perpetual access and any encroachers can be dealt with according to the authority which has been transferred to a WUA, for example.

135. Some WUA comments requested that the government water suppliers be held more accountable in the BIO-WUA contract to their failure to deliver amounts of water at times specified in agreed upon water use plans. This shows that there is room for better written agreements with caveats and waivers of liability – a type of legal language which comes with experience by both parties.

136. The MAWR establishes water use limits for agricultural enterprises. Some flexibility is necessary so that MAWR can change these limits in accordance with water availability in their larger systems. At the inter-farm level this flexibility needs to be given to the WUA as primary water user.

137. Stated another way, government suppliers and WUA receivers must have some flexibility in how they distribute water to their constituencies along a river, in a basin, or along a major canal. In water short years, stress multiplies and often the more powerful or the upper basin users get an unproportionate share of the limited water. For example, in 1991 upper Amu Darya provinces received 110% of norm, middle reaches 70% of norm, and Karakalpakstan at the bottom of the basin only 10% of norm. When real uplinkages are in place in a basin, tailenders should have some recourse through representation by their most able spokesman. Supporting the development of these uplinkages on a ditch, in an WUA, at the Federation of WUA level further upstream should be a major institutional water reform target. However, there may be resistance just because the public (client) would then be in a stronger bargaining position, something that institutions used to wielding power might be reluctant to face.

138. Every case is different all over the world. In California contract and rights language is different depending on who paid for initial construction of water supply systems and how the intermediary water suppliers are organized. In the Yakima River Basin of eastern Washington state, irrigation districts have either senior or junior water rights. The federal government operates reservoirs in the mountains and throughout the year informs the irrigation district managers monthly at a transparent meeting with dialogue of expected flows during the irrigation season. When and if water begins to be curtailed in a water short year, the irrigation districts have already informed their farmers to expect major cutbacks at certain times. A typical re-allocation then might have junior rights districts receiving only 30% of their normal flow while senior rights holders receive 70%. In Uzbekistan there are no senior and junior water rights – any cutbacks should be fairly shared. But then water measurement takes on a more important role.

139. A model agreement between a WUA and its farmer members was developed and patterned after the BIO-WUA agreement. This subsequent agreement is not necessary as the charter already spells out rights and responsibilities and redress for members. Ideally the WUA Council is composed of wise volunteers who represent various geographical parts of the WUA and can represent a farmer or hear his appeal. If WUAs are to have clear decision-making authority and responsibility to operate and maintain water systems for the benefit of their farmer constituency, they must also have the right to deny water to or otherwise sanction members who have not paid their water use fee or are otherwise out of compliance with WUA regulations.

140. Several WUAs have developed water use agreements with neighborhood “mahalla” committees for supply to homes and kitchen gardens. If there were some employing industry nearby, this might be a potential secondary user market which could afford to pay a higher charge per unit of water.

141. A permanent water use permit was proposed as an alternative to renewing annual contracts between suppliers and WUAs. These would be approved by and filed with the State Committee for Nature Protection for surface waters and State Committee for Geology and Mineral Resources for groundwater. Apparently this would make those government bodies the arbiter in case of disputes between suppliers and WUAs.

142. Holding clear title to land could go a long way towards securing greater farmer buy-in to being a better steward of the land. Knowing that his son or grandson could inherit his land might impress the present farmer to take better care of the land and manage his water better. Currently he can lose his lease if his yields drop below standard norms during a 1 – 3 year period. If he owns the land he is in a better security and collateral-wise position to make capital improvements which will increase his long term profitability.

III. Economics and Finance

Economic / Financial implications – whether farmers / WUAs are willing and will be able to repay the costs associated with technological and other improvements at on-farm / WUA level and how the proposed introduction of water delivery fees would affect their ability?

143. The MAWR’s budget in recent years is only about 1/3 of that required for long term sustainability, and some portions of systems constructed in the 1960’s are now needing major rehabilitation. Therefore, a big push by the MAWR to form WUAs has been hastened by the government’s inability to mobilize funds to maintain its massive water resources infrastructure. Perhaps when markets open up and farmers have more income, they will be willing and able to pay their share for O&M and some cost share for major rehabilitation.

144. The weakest portion of the TA findings are in the area of Economics and Finance, because no economics specialist was envisioned in the TOR. There is an extreme shortage of agricultural and resource economics expertise among the Central Asian population whether in

the universities, ministries or private sector. One obvious reason for this is the 70 years of centrally planned economics in the Soviet days. A second reason is that rural educated agricultural students rarely met the English requirements for study abroad scholarships initially awarded by the Uzbekistan UMID Foundation. Any Western educated specialist in this area is quickly hired by international projects (sometimes as an administrator and not an economist) but they have not made their way into the agricultural universities. So that trend is likely to continue until major policy interventions are made. Consideration could be given to influencing the existing ADB – Joint Japan Scholarship Fund to open up more graduate level training slots in agricultural and resource economics at regional universities such as Asian Institute of Technology in Thailand where a number of TIIM alumni have received MSc diplomas, Middle East Technological University in Ankara, Turkey as well as the University of Bonn in Germany which has a successful program in water management well under way.

145. The Project Consultant studied the question of farmer ability and willingness to pay for water and made presentations to the EA and ADB which were not reviewed by the TA. One task of the TA Irrigation and Drainage O&M specialist was to determine optimum and most profitable mix of crops. The ZEF Khorezm project, funded by Germany, has assigned a number of MSc and PhD researchers to develop and test a model over the past 5 years for an answer to this issue.

146. In pre-czarist times, a local “mirab” = ditch rider received 1/8 (12.5%) of the gross agricultural production income for his staff’s services in managing and maintaining a water delivery infrastructure. In addition, collective “khashar” canal cleaning and repair parties were organized by area leaders in which not only labor but materials were mobilized. It is this type of historical precedent for local control / collective action in O&M of water delivery infrastructure that WUAs need to capitalize on in taking on the responsibilities currently being transferred to them by the MAWR. However, from the IWMI literature, PIM successes have occurred where farmers pay only a small portion of their gross production income for water services (usually less than 6%).

147. World experience has shown that farmers become more efficient managers of limited resources when they are freed up to take risks and make their own choices about which crops to grow when world prices prevail. Letting the market dictate real prices for inputs and water delivery services brings the farmers out from under a dependency regime. The economic engine principles will assist the better managers to capture the resources and the less endowed farmers to work for them or find another vocation. There will be lots of successes and not a few failures.

148. The CabMin on March 24, 2006 with resolution #42 made credit available for infrastructure / equipment improvements to pilot WUAs which would start charging water use fees. Through this action many issues emerged that need more attention.

149. Special concerns about expenses for pumping irrigation water are merited. 58% of irrigated land in Uzbekistan is served by pumped water. In 1999 there were 12,500 pumps on collective farms alone. Pump impellers wear from sediment and the units become less efficient with age. Electricity costs in Uzbekistan have been rising in tune with international prices. In 1991, only 14% of MAWR’s O&M budget was allocated for electricity. By 2004 this had risen to 68%, so purchase of electricity just for irrigation operations was squeezing out other infrastructure repair requirements. Simple spreadsheet models have been developed for a World Bank study (Hamilton and Butcher, 2006) to explore how changes might be made to reduce pumping costs. Conclusions by that study included making conveyance efficiency improvements before pump station rehabilitation, metering pumping schemes, charging more for water under pumps, planting lower water demand crops or fewer Ha under pumps or retiring some lands under pumped irrigation.

150. In 2007 electrical rates increased by at least 1/3 to residential consumers. A decree in 2003 provided for reimbursement to farmers / WUAs for electrical pumping costs for the wheat

and cotton crops. Many WUAs are unaware of that provision, or unsuccessful in negotiating with the electrical supplier. Other farmers with different crops on pumped schemes feel that they should not have to pay more for their water just because their father was assigned to those lands when they were initially developed for irrigation.

151. Discussion was given about setting up an insurance fund to pay for damages from canal breaks, etc. It is quite doubtful, given the general condition of Uzbekistan's infrastructure, that any private investment / insurance fund would accept the risk of insuring such a sector where maintenance has been deferred for so long a time.

152. Farmers often do not manage their on-farm water very well. There is no penalty for overuse or water wasting and there is no real incentive for conserving water. A very cumbersome administrative set of instructions for paying a premium for those farmers who conserve water was set up but does not seem practical. Everyone recognizes that water conservation will occur when farmers finally pay for water, not receive indirect subsidies such as lower cost of fuel or seeds in exchange for selling the state ordered crop for much less than the world price. Metering works well in urban setting but is too expensive and technical for the average farmer. Some governments such as Israel and the USA, in order to stimulate water conservation, make a combination of grants and credit available for farmers to investigate in water saving technology such as gated pipe, siphon tubes or drip irrigation.

153. There is some discussion that specialty crops (such as rice or certain vegetables such as onions) could pay much more for water than state order crops. But tying a water service fee to a certain crop (with the exception of rice) would involve too much administrative oversight.

IV. Institutional Capacity Building

Institutions - are there proper institutions in Uzbekistan that would be able to carry out water sector reforms at all levels?

154. The most critical element should be to establish the Water Sector Reform Support Unit at the MAWR level as originally envisioned in this TA and to assist that group to come up to speed with lessons on WUA development which have already been learned. There is a wealth of experience which could be tapped from pilot WUA projects in Fergana Valley, Khorezm province and Karakalpakstan which have been led by organizations such as IWMI in partnership with SIC-ICWC, etc. and funded by SDC-SECO, ADB and World Bank and JICA, etc.

155. As previously discussed, major reform interventions through training could be aimed in the Human Resources disciplines with mid-level managers at all levels of the MAWR. Study tours abroad as originally envisioned in this TA should still be considered in order to awake interest in water sector reform and learn from others who started this process some years ago.

156. Following are additional comments regarding WUA charter documents. Some items in the model WUA charter or ensuing discussion seem to over-define the role of the General Assembly of water users according to most common international experience. Most farmers are too busy to get too involved in the details of their water supply. Further refinement of model charter details should reflect these outcomes in terms of clear roles and expectations among the General Assembly, Council, Executive team and Auditing Committee.

157. An initiative group of a minimum number of farmers along a main canal and secondary canals needs to meet to discuss the value of forming a WUA. If agreed, they sign a formation agreement so that the WUA can begin developing its own draft charter through a subcommittee. A General Assembly of all proposed members would then need to ratify the draft charter, elect and empower a WUA Council to represent the WUA in all registration, legal and financial matters and begin its search for the right General Manager which it, not the district MAWR, will hire. The General Manager (Executive body) then selects his staff and begins inventorying

infrastructure and developing a plan of work and budget. From here on the General Assembly meets just annually (if then).

158. But the General Assembly elects the WUA Council as its representative body to set policy and approve water service fees which the General Manager must implement. The General Manager and his staff do all the work of delivering water and maintaining infrastructure. The Council and the General Manager then generally meet usually every month and keep minutes which are available for any interested WUA member to read. Serving at the will of the elected Council, the General Manager and his staff understand who their boss / client base is – the farmers which through the Council have given him a task and a salary as compensation. The Chairman of the WUA Council is elected by his Council peers and provides leadership and is a spokesman for the Council. He should not interfere in the WUA operations. There seems to be lots of confusion of roles between the Chairman of the Board and the General Manager or Executive Director of most non-governmental organizations. The Chairman has ultimate legal and financial responsibility for the organization. But he needs to delegate to the General Manager or Executive Director a large degree of financial responsibility (expenses of approved budget items up to a certain limit, for example, without requiring extra signatures from Council members) and operational responsibility. Therefore, the General Manager and not the Chairman will hold and use the organizational seal (“pechat”) for most routine correspondence and reports. The General Manager and his staff prepare the annual reports, proposed work plans and budgets which are submitted to the Council for approval.

159. An audit committee is usually composed of at least 3 people not working under the General Manager. A yearly audit, as opposed to quarterly, should be sufficient to insure that proper accounting methods and practices are being employed.

160. Disputes which arise out on a canal or ditch among water users or between a water user and his “mirab” should be resolved at the lowest level possible. Its very Asian to involve a neutral third party as mediator. Farmers should always have the freedom to take their concerns higher, but a good General Manager will usually back up his “mirab”. Finally a grieved water user can take his cause to the public monthly Council meeting and get a hearing. It is rare that a special commission would have to be called and even rarer that the General Assembly would have to come together for such discussions.

V. Technical (Operations and Maintenance of Infrastructure)

161. It appears that when the collective farms were dissolved and replaced by “Shirkat” cooperatives, and then those were replaced by private farmers holding long term leases, that a certain institutional function of monitoring inter-farm and on-farm collector drain systems and reclamation status “slipped through the cracks”. The argument is made that farmers will always give adequate attention to canals, because they know they need water for their crop. If facility maintenance upstream is inadequate, a farmer will eventually search in that direction, taking his friends with him, to find out what the problem is. However, few farmers take an interest in what happens downstream from their farm, or under the ground until its too late and their land has become waterlogged and salinized.

162. As mentioned previously, ½ of Uzbekistan’s 4.4 million Ha of irrigated land is seriously waterlogged or salinized. Drainage effluent salinity levels are 1.5 – 3 grams/liter in upper basins and 3.5 – 7 g/l in lower basins, which can severely impact crop yields if used for irrigation. 20% of fields have serious soil erosion problems. Organic matter and native fertility of these desert soils under a long term cotton monoculture has decreased microorganism activity up to 10 times. Farmer’s wastewater from poor on-farm irrigation management can end up in and overload collector drains initially designed to only accept mostly subsurface tile drainage flows. Ideally for most sustainable water – salt balances, about 1/3 of all applied water should make it through the soil to exit the basin in collector drains. Certainly someone needs to monitor the reclamation status of the soil resource.

163. It has been proposed to revitalize province or district level Hydro-Geological Reclamation Expeditions (HGRE) and to fund their activities from water service fees collected by inter-farm canals. Perhaps this function just needs to be integrated into the province level Agriculture and Water Department on-farm water division (PAWD). Where the funds come from and into which organization may not be as important as that they do come from somewhere. It requires staff, vehicles, drill rigs, equipment and laboratory facilities to monitor key data sites. There may be room a lower number of staff and more high tech applications such as remote dataloggers connected through satellite technology or shallow mobile drill units mounted on a pickup or hand carried, but nevertheless, attention is still needed periodically in the field to install, calibrate, check and repair such equipment. Perhaps there is room in the 2007 national program on land reclamation to propose national funds for this purpose.

164. The TA envisioned the following tasks which this upgraded HGRE / PAWD function might accomplish:

- 1) updating crop consumptive use norms
- 2) mastering the water use plan computer program applications and providing training for its use
- 3) reduce water loss by 20% through teaching farmers better irrigation and leaching techniques (several foreign specialists who have become acquainted with leaching techniques in Uzbekistan have felt that too much water is used too often, especially when drainage systems are absent or poorly maintained.
- 4) assessment of drainage water quality for irrigation reuse and leaching
- 5) drainage system monitoring, repair and regulation to allow for crop conjunctive use (combined with irrigation)
- 6) introducing / evaluating bioremediation techniques such as planting licorice to lower water table and salinity levels
- 7) selecting salinized lands to retire
- 8) developing public awareness of best management practices and responsible land stewardship

165. Most new WUAs complained that they had no technical base upon which stand – office, vehicles, maintenance equipment, communications (telephone, computer, internet). A “Shirkat” liquidation commission process was set up, but from the time collective farms were dissolved until WUA’s formed, there was a lot of time for the best equipment to make it into private hands and the worst to remain broken down. This is a place where the active support of the district “Hokim” needs to be developed, and if need be from the BIO using its influence at the province level because conditions in most districts are similar.

166. There are something like 18,000 official canal turnout structures in Uzbekistan, most of which could conceivably be the beginning point of a WUA. Many are in need of repair. Most do not have a water measuring device downstream. The MAWR should lobby for funds to grant canal gate outlet repair and installation of the proper water measuring device when a new WUA has completed its registration in the local Ministry of Justice. Calibration / registration of the water measurement device should meet MAWR standards but perhaps be held by the appropriate BIO until a Federation of WUAs or Canal Management Council were formed. This precedent was set by the EA with this TA for the 12 emerging WUAs spring, 2007.

167. Further water distribution among farmers on a rotation system within the WUA should be made by an experienced “mirabs”, WUA employees, who have gained the trust of the farmers.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. Further Activities

168. Table 4 identifies impediments to reform, TA Consultant’s lessons learned, and recommended further steps for the GoU and external funding agencies such as the ADB to take

in the framework categories of Policy, Legal, Economic – Finance, Institutional and Technical. 21 recommendations of a programmatic nature are listed, which include 2 relating to Loan – TA management.

169. The most critical next step should be for the MAWR to form its Water Sector Reform Support Unit which this TA envisioned. This unit should be adequately funded for a 5 year period. All other recommendations are subservient to this one's implementation. If the WSRSU is not formed with the right staff, there will be no competent, energized, hopeful group of people to step through all the other recommendations which have come forward in this TA and the ADB WUA Guidebooks. Because policy and legal are such major framework categories with this institutional reform TA, at least one progressive leader should be funded by the GoU for full time employment in the WSRSU from each the President's Office, the Parliament and the Cabinet of Ministers.

B. Expected Outputs

170. Table 5 summarizes Table 4 with key words and presents the expected outcomes of the recommended interventions for the 5 framework categories of Policy, Legal, Economic – Finance, Institutional and Technical.

171. The "jury is still out" on the financial returns to IMF's from investing in post-Soviet emerging Central Asian economies. Sometimes the value of any one intervention is a bit like throwing the dice or pulling the slot machine handle. Only after the move is made does it become obvious if that effort succeeded in the desired outcome. Some cells in Table 5 are colored with the Consultant's subjective hunch of which interventions might be more strategic or which results could likely be more successful. As in the slot machine or die, when everything lines up, there is great rejoicing. Therefore, for this simple slot machine illustration, take note when the turquoise, rose and green cells line up horizontally. These are further explained as follows.

172. Intervention P1.0 concerns the establishment of the Water Sector Reform Support Unit in the MAWR. This would become the focal point for all reform efforts and if managed well, could result in coordinating interest and working groups at the Presidential apparatus, Cabinet of Ministries and Parliament levels, especially if a representative of each of those agencies were assigned to the unit. However, this unit has not yet formed despite its inclusion in this TA.

173. The outcome of Legal L1.1 GoU interventions in making land ownership a reality will soon be revealed. Land reform traditionally has proceeded the movement of economic resources to more efficient uses in developing countries as a middle entrepreneurial class develops the means to make further investments. It must be noted that EU TACIS projects on land reform in Uzbekistan began almost a decade ago and a land code was only recently adopted. The development of this land market, concurrent with strengthening of the judicial system and foreign investment climate, could have immense impacts on investment and employment in the rural sector. Consider where things could be a decade from now if more investment and attention were to be made in the water sector, inviting a broader participation of stakeholders.

174. Intervention I1.1 suggests a major training intervention in Human Resources skills for mid-level managers 45 years old and younger in all agricultural organizations, but beginning with MAWR and its provincial affiliates. This kind of training could prepare the MAWR to eventually re-orient itself as a service and regulatory agency.

175. PIM/IMT/WUA institutional reform has been occurring all over the world for the last 20 or more years, especially in developing countries. Successes have been mixed. But economic realities, greater demand for water from a growing population and a deteriorating infrastructure along with donor nudgings are forcing Central Asian countries to join the parade. Unfortunately, the pre-imminent Soviet water resources education institute in Central Asia has still not come on

board yet with changes in critical management education directions. To prepare a new career field of WUA Managers, intervention I1.2 envisions an MSc course curriculum being developed at the Tashkent Institute of Irrigation and Melioration along with a program of summer practical internships with the emerging pilot WUAs in the region. Impetus for this change should come from TIIM. But historically all directions for new initiatives come down from above. Therefore, the Education Division of the MAWR and Curricula Development Division of the Ministry of Education ought to come together to talk about this opportunity.

176. Intervention T1.3 suggests that bioremediation research and extension efforts should be explored as an alternative to or in conjunction with strategic infrastructure rehabilitation investments. Organizations such as the United Nations Development Programme (UNDP), IWMI, International Center for Agricultural Research in Dry Areas (ICARDA) and International Center for Biosaline Agriculture (ICBA) as well as some European NGOs have funded various pilot projects managed by local scientists on shoestring budgets near the Aral Sea and in Syr Darya province. If this technology were to prove economically feasible, farmers displaced from land which had gone sour could return to the land and make a living once again. The social advantage to this could be immense. Additional capital would then be needed to upscale and move the research into the commercial sector.

C. Summary

177. True reform is about breaking the hold of monopolistic structures / systems / ways of thinking which keep people disempowered, and introducing a competition which allows those same people some choices. When the economic engine is allowed to warm up and checks and balances are in place which limit the abuse of absolute power, there is no holding back because the new wine is much better than the old. Prices will decrease, quality of goods and services will increase, an emerging middle business middle class will do something about oppressive bureaucratic burdens, and investment and employment will increase. People are Uzbekistan's greatest asset. The majority of the recommended interventions are about empowering people in a participatory environment to participate in designing their country's great future.

TABLE 1. COMPLETION OF GROUPED TORs

Component 1 – National			Component 2 – Province / Basin		
POLICY	LEGAL	ECONOMIC – FINANCIAL	INSTITUTIONAL Networking Management	TRAINING Training Planning	TECHNICAL Operations / Infrastructure
			T4 Setup & strengthen MAWR Water Sector Reform Support Unit	T13 Setup & strengthen SPAWD WUA Promotion & Coordinating Unit	
				T12 Strengthen SPAWD WUA Technical & Advisory Capacity	T14 WUA and O&M Training
			T5 WUA formation & operations guidelines & dissemination	T10 Strengthen ASBIO Management & Planning Capacity	T9 Develop ASBIO Operational Procedures
			T8 Organize MAWR Study Tour abroad	T15 ASBIO / SPAWD Study Tour abroad	
			T7 Organize MAWR Degree Programs abroad		
T3 Analyze WUA formation & operations legislation & recommend Policy & Legislative interventions					
T1 Develop Cost Recovery Policy					
	T2 Develop concepts, methodologies, legal docs & implementation plan for water delivery fees			T11 Develop Amu Zang water delivery fees implementation plan	
T6 Advise government on long term reform policy & investment strategies			T16 Reports		

TOR Fulfilment estimates 0%: No dialogue 0%: No funds 0%: MAWR rejected abroad training
25%: TOR lacked economist position, TA ahead of Project procurement; 50%: Project function;
100%

TABLE 2. TRAINING TASKS IDENTIFIED BY TA & PROJECT

	P – Primary / S – Secondary recipient DT – Domestic Trainer ¹ IT – International Trainer ¹ inc Consultant / Advisor / Working Group	Government					NGO				Gov't dom-in-ated	Pri- vate	
Frame- work:	Level: Capacity Building Dimension	I Pres- ident, CabMin, Parlia- ment	II Natio- nal MAWR	IIIA-1 Civil gov't “Hoki- miyat”	IIIA-2 PAWD HGRE BIO		IIIB-1 Int’l trained pilot WUAs	IIIB-2 New Feder- ations of WUAs (FW)	IIIB-3 WUAs		IVA Agri- busi- ness Sup- port sector	IVB Far- mer	
					No pilot exp	pilot exper- ience			New	Exist- ing			
POLICY Policy framework supports IWRM, PIM, WUAs?	NOTES: Beyond scope of just water reform				Amu Zang Proj Training		TA info / some Training			AZP-TA			
	I P1 Establish effective cooperation between sectors: agriculture, water resources, environment, finance, civil gov't) IT	P	P	S			S	S	S		S		
	I P2 Open markets & farmer empowerment	P		S				S			S	S	
	I P3 Set tone for MAWR reform & service agency re-orientation (Vision & Mission – V&M) IT	S	P				S	S	S				
	I P4 Strengthen civil society (NGO) participation in agricultural sector (leverage strength of other funded programs) in order to demonopolize gov't services & encourage competition from private sector, thus improving quality & lowering price at every level	P	S					S	S			S	
	I P5 Incentives: Lobby Gov't for higher salaries in this critical sector; Establish incentives at all levels for performance excellence	P	S				S	S	S				
	I II III P6 Public Relations Campaigns: Target / develop or adapt existing / disseminate appropriate media materials / live speeches on IWRM / PIM / WUA support at each level	P	P	S	P	DT	DT	P	P	P	S	S	

Frame- work:	Capacity Building Dimension	Level:	I Pres- ident, CabMin, Parlia- ment	II Natio- nal MAWR	IIIA-1 Civil gov't "Hoki- miyat"	IIIA-2 PAWD HGRE BIO		IIIB-1 Int'l trained pilot WUAs	IIIB-2 New Feder- ations of WUAs (FW)	IIIB-3 WUAs		IVA Agri- busi- ness Sup- port sector	IVB Far- mer
						No pilot exp	pilot exper- ience			New	Exist- ing		
LEGAL & REGULATORY Laws in place / followed?	I L1 Familiarize with other countries enabling legislation		P	S					P				
	I L2 Encourage Water Lobby : Engage relevant stakeholders in law-making process		S	S			S	P	P				
	I L3 Advise lawmaker subcommittees on PIM, WUA requirements through lobbying working groups IT		P	S			DT	DT	P				
	I L4 Understand the impacts of legislation, policies & project agreements on the Public		P	P		S	S	DT	S	S			S
INSTITUTIONAL Networking / Training / Planning / Management	I I1 Develop Training Curricula IT			P			S	S				WUA Mgmt - TIIM	
	II I2 Introduce market economics type Human Resources (HR) principles for service organization IT			P	S		S	S	S			S	
	II I3 Extend Trainer of Trainers (TOT)			P		P	DT	DT	S	P			
	II I4 HR: Re-develop internship, recruiting (including non-engineers & women), early field training rotations, manager development & senior re-training programs (including philosophy of lifetime learning / mentoring) IT			P	S		DT	DT	S			Target Univer- sities	
	II & III I5 HR: Stimulate Career Development program (CV, Professional Development Plan)			S	S			P	P	S			
	II & III I6 HR: Develop writing & speaking skills for managers & supervisors			S	S			P	P	S			
	II I7 Develop Key Results & Indicators (KRI) to support MAWR V&M IT			P				S	S				

Capacity Building Dimension		Level:	I	II	IIIA-1	IIIA-2		IIIB-1	IIIB-2	IIIB-3		IVA	IVB
		President, CabMin, Parliament	National MAWR	Civil gov't "Hokimiyat"	PAWD HGRE BIO		Int'l trained pilot WUAs	New Federations of WUAs (FW) New	WUAs		Agri-business Support sector	Farmer	
					No pilot exp	pilot experience			New	Existing			
INSTITUTIONAL Networking / Planning / Mgmt	II I8 Develop monitoring & evaluation (M&E) system to evaluate II I1 at all levels		P			S	S	S				S	
	II I9 Energize planning , total quality mgmt (TQM), teamwork & M&E functions IT		P	S		DT	DT	S			S		
	II III I10 IWRM & PIM principles in nurturing WUA & FW Formation & Development		S		S	DT	DT	P	P	P			
	III I11 HR Job Fit : Re-assess organizational chart, develop position descriptions, initiate performance evaluations (decentralize authority & empower initiative) IT		S	S		P	P	S					
	III I12 Recruit volunteer Advisory Groups from service constituency					P		P					
	II & III I13 Utilize modern Management Information System (MIS) database resources		P			DT	P	S	S				
	III I14 Financial Management : Financing, Bookkeeping, Auditing		S			DT	DT	P	P	P			
ECONOMIC-FINANCE	I EF1 Assist CabMin & MAWR re-evaluate financial & info systems resources required to respond to policy changes IT	P	P			S	S	S					
	II EF2 Identify & budget training & office equipment costs	S	P			S							
	II EF3 Develop 10 yr main system rehabilitation financial programming priorities	S	P			S							
	II III EF4 O&M Planning & Budgeting		P			DT	DT	P	P	P			
TECH-NICAL Water System	III T1 Main System Computer Modeling		P			P		S					
	III T2 HR: Conflict Resolution on the canal					DT	DT	S	P	P		P	
	III T3 Water Use Plan / Water Accounting					DT	DT	S	P	P			
	III T4 Distributing Canal Water					DT	DT	P	P	P			

	Level:	I President, CabMin, Parliament	II National MAWR	IIIA-1 Civil gov't "Hokimiyat"	IIIA-2 PAWD HGRE BIO		IIIB-1 Int'l trained pilot WUAs	IIIB-2 New Federations of WUAs (FW) New	IIIB-3 WUAs		IVA Agri- business Support sector	IVB Far- mer
					No pilot exp	pilot exper- ience			New	Exist- ing		
TECH- NICAL Water System	III T5 Operating & Maintaining Pumps					DT	DT	S	P	P		
	III T6 Land Reclamation: drainage systems, waterlogging, salinization, soil reclamation (including bioremediation)					HGRE DT	DT	S	P	P		P
Farm Management	Ak Altin, Amu Zang pilot project examples:											
	IV FM1 Establishing & Managing Agricultural Service Centers IT		S			PAWD DT					P	S
	IV FM2 Establishing & Managing Private Farms IT		S			PAWDS					S	P
	IV FM3 Agronomy					PAWD DT					S	P
	IV FM4 Irrigation Techniques					PAWD DT						P

**TABLE 3. MEASURING UZBEKISTAN'S WATER SECTOR REFORM APPROACH
AGAINST INTERNATIONAL CRITERIA**

CREATION OF AN <i>ENABLING ENVIRONMENT</i> ¹	INSTITUTIONAL REFORM GUIDELINES ²	PRINCIPLES OF SUCCESSFUL IWRM ³	FORMULA FOR SUCCESSFUL IMT OUTCOMES ⁴	CAPACITY OF SUPPORTING INSTITUTIONS ⁵
<p>¹ Vermillion, Douglas L. 2004. Creating an enabling environment for productive and sustainable water user associations.</p> <p>Synonyms of <i>Enabling</i> found in the WUA literature: <i>survive, grow, prosper, thrive, nurtured, supported, empowered</i></p> <p>#</p>	<p>² Johnson, Sam H., Mark Svendsen, Fernando Gonzalez. 2004. Institutional reform options in the irrigation sector – agriculture and rural development discussion paper 5. The International Bank for Reconstruction and Development / The World Bank</p> <p>#</p>	<p>³ Manthrililake, Herath, IWMI. 2005. IWRM in Fergana Valley: institutional and technical aspects. In proceedings of Republican Scientific and Practical Conference on Transition toward Market Economy in Water Resources Management & Land Melioration in Uzbekistan. MAWR/TIIMWSU.</p> <p>#</p>	<p>⁴ Abullaev, Iskandar, IWMI. 2005. Analysis of irrigation management transfer around the world: formula for success. (MAWR/TIIMWSU)</p> <p>Successful outcomes =</p> <ul style="list-style-type: none"> • improved O&M • fee collection • land productivity • conflict resolution <p>Ag reform pre-conditions + supportive environment</p>	<p>⁵ Rose, Gary. 2007. This TA Consultant's Bi-monthly Report, Jan 07; sec 3.3.4</p>
POLICY ENVIRONMENT				
<p>1 Clear, high level support</p> <p>9 Institutional reform precedes technical rehabilitation</p>	<p>1 High level involvement & commitment: no donor pressure</p> <p>4 No donor-supported one-model-fits-all approach</p> <p>9 few pilot interventions (compared to rapid, expanded country-wide) avoids or delays serious institutional reform</p> <p>8 New WUA managers participate in rehabilitation planning</p>	<p>9 Reliable & sustained financing & human resources support</p> <p>3 Systems approach to policy, legal, economics, institutions, technical (infrastructure)</p> <p>5 Attention to social dimensions in policy formation, promoting:</p> <ul style="list-style-type: none"> • equitable access to services • employment/income change • enhanced role of women in decision-making for project quality & sustainability <p>1</p> <p>2</p>	<p>Irrigation central to high-performing ag system</p> <p>Farm size big enough that farmer acts as an agribusinessman</p> <p>Adequate socio-economic-technical context</p>	

SWOT analysis: **Green = Strengths**; **Gray = Weaknesses**; **Blue = Opportunities**; **Yellow = Threats**

LEGAL FOUNDATION							
2	PIM & WUAs founded on clear & strong legal basis	6	Major legislative changes required	1	WUA boundaries based on hydrography	Land & water rights	Respect for law (property, entitlements, contracts & agreements) Impartial legal system <ul style="list-style-type: none"> • adjudicates disputes • enforces settlements • affords lawyers
3	WUAs & farmers have clear water use rights						
INSTITUTIONAL CAPACITY BUILDING (Networking / Training / Management / Planning)							
6	MAWR reorients itself to: <ul style="list-style-type: none"> • build capacity • provide WUA support • regulate water sector 			2	Critical to integrate water & environmental management	collective action fostered	Openness & transparency in gov't, public, NGO & corporate decision-making serves <ul style="list-style-type: none"> • democratic processes • local control • efficiency
8	Stakeholder Consultations & Public Awareness campaigns	2	Gov't, WUA & farmers <ul style="list-style-type: none"> • share reform vision • have will to implement regardless of political changes 				
4	WUAs receive full decision-making authority	3	Communications strategy with feedback mechanisms involves gov't policymakers, regulators, BIOs, WUAs, farmers in discussing expected roles	4	Full participation of all stakeholders with high autonomy / transparency / accountability		
5	WUAs federate to the main system level	5	Educate users about real value & costs of irrigation service				
		B					

SWOT analysis: **Green = Strengths**; **Gray = Weaknesses**; **Blue = Opportunities**; **Yellow = Threats**

TABLE 4. SUMMARY OF TA RECOMMENDATIONS

Category	Impediment to Reform	Lesson Learned by Consultant	Proposed Interventions		
			No.	GoU Activity	External Support
Loan Mgmt	Loan Project & TA not coordinated	Short term int'l TA consultant can't influence policy formation	M1.0		Award TA & Loan Project to 1 managing Int'l Consultant
	MAWR more interested in infrastructure rehab. than sector reform	EA doesn't take TA grant seriously – "get what you pay for"	M1.1	Future TA EA Proj Dir assigned to PMO; available to TA Consultant	Major donors should seek coordination in sector
Policy	No MAWR coordinating / training unit for all water reform projects	No MAWR leadership in donor-prompted reform. Wealth of Pilot experience untapped	P1.0	Establish 5 yr Water Sector Reform Support Unit (WSRSU) w/ CabMin, Parliament & MAWR	Fund from ADB, WB, SDC, JICA
	No active Water Lobby in the education & NGO community	Natural resources public policy training at TIIM (WSU) extended; training in Int'l Water Law in Dundee, Scotland.	P1.1	WSRSU / Stakeholder's monthly roundtable, Pilot WUA tours, Study Tour abroad	Int'l Centre for Water at Charles Stuart University in SE Australia / WSU
			P1.2	Train WSRSU trainers thru PIU	
	District "Hokim's" control WUA activities or are non-supportive	WUA Managers find win – win solutions through networking & public relations	P1.3	WSRSU sponsored Amu Darya & Syr Darya basin discussion forums with provincial governors & their District "Hokim's"	
	No plan for federating WUAs in BIOs		P1.4	BIOs develop contracts with Federated WUAs & provide training	Stimulate pilot WUAs to federate in their areas as NGOs
	Federated WUAs must focus on water allocation, O&M & WUA representation		P1.5	MAWR should not expect federated WUAs to provide ancillary ag functions (inputs, marketing)	Encourage private sector to provide these services
	Poor environment for women to grow into leadership positions	A delicate area of discussion	P1.6	Consider staff recruiting / promotions interventions	study World Bank analysis of 121 water projects where women in decision-making positions improved project quality & sustainability

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			Proposed Interventions		
Category	Impediment to Reform	Lesson Learned by Consultant		GoU Activities	External Support
Legal	No coordinated Water Code effort – multiplicity of confusing & contradictory laws	Same recommendations get recycled from 1 project to the next	I1.0	WSRSU- Parliament subcommittee study & propose legislation using ADB WUA Guidebooks & TA recommend's	Fund support after example of EU-TACIS on Land Code
	Farmers have not had secure land rights / investment collateral		I1.1	Jan 2008 land is available for sale first to leasees; fund long term soil / water conservation projects by cost share	Train & offer credit to S&ME agribusiness investors; new landed class will demand greater gov't accountability
Economic – Finance	Lack of local expertise in agricultural & resource economics	GoU has retained few young scholars who have trained abroad	E1.0	Create win-win opportunities by providing free housing & higher salary incentives	Increase ADB-joint Japan Scholarship Fund; Add mentored internships; Leverage ZEF U Bonn - Khorezm mentoring
			E1.1	Trained extension economist placed with pilot Ag Service Center / PAWD & support pilot WUA farmers; academic review of cost recovery studies	Support ag economics extension training
	No incentives for water conservation		E1.2	Grant each new WUA formed & registered w/ Min Justice w/ funds for repairing turnout gate & measuring device, plus computer / printer & refurbished backhoe	Loan support to WUAs which pay for water based on measurement & passing costs proportionately to farmers by crop type & area
Institutional	Engineer-dominated MAWR reluctant / unable to reorient itself to a service / regulating organization	Empowered & farmer-sensitive organizational outsider required to lead reform effort – this may be a matter of national security	I1.0	Seek competent reform leadership who can unite staff around service vision (military background w/ Participatory training?)	Ensure that PIU targets / lobbies Parliament & CabMin with Project success stories
	Agricultural reform must be a long term commitment regardless of present politics	Training is one of the most cost effective investments	I1.1	Invest in HR on-the-job training for mid-career managers 45 yrs old & younger	Support a full time int'l management / training consultant in WSRSU

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Category	Impediment to Reform	Lesson Learned by Consultant	Proposed Interventions		
				GoU Activities	External Support
	Ag education policy directed by MAWR, not Ministry of Higher Ed	Int'l water projects of past 15 years have bypassed contributions to higher education	I1.2	TIIM to develop curricula for MSc in WUA Management / summer practical mentored internships w/ pilot WUAs	Support RFP for curriculum development in partnership with Western water university
	WUAs not experienced w/ elected governing board & paid Gen Mgr		I1.3	WSRSU delays refinement of model WUA charter until more experience from pilot WUAs	
Technical	MAWR rehabilitates 10,000 Ha / yr of irrigation & drainage infrastructure but 5 x that is lost to water logging & salinity elsewhere	Government staff are reluctant to tell bad news to the boss. Let the private, NGO & education sector share that burden after the Water Lobby has been developing	T1.0	Consider land abandonment / industrial investment policies with attendant resettlement	Support good technical – economic studies / models
	Electricity costs for pumping are escalating, threatening feasibility of irrigating some lands		T1.1		
	Drainage system infrastructure rehabilitation costs are staggering		T1.2		TA for training & approp. technology: salinity field kits & meter, mobile drills, GPS monitoring after SANIRRI – TACIS experience
	Unclear responsibility for reclamation of inter-farm collector drains & monitoring of GW / salinity / leaching programs		T1.3	Involve PAWD agronomists, engineers & economists in demonstration trials	Further support ICARDA/ IWMI/ICBA bioremediation /marketing on Galaba Dist & California experience

TABLE 5. SUMMARY OF EXPECTED OUTCOMES

Category	No.	GoU Activity	External Support	Expected Outcome
Loan Mgmt	M1.0		1 TA / Loan Project Consultant	Continuity of consultant inputs; TA & Project coordinated
	M1.1	TA EA Project Director under PMO	Major donors sectoral coordination	Dialogue w/ EA policy makers; GoU more accountable for reforms that it commits to
Policy	P1.0	WS Reform Support Unit established	Funded by major donors for 5 yrs	Focal point for reform process established; national policy & law maker dialogue / coordination improves
	P1.1	Monthly roundtable, pilot tours, study tour abroad, short term training abroad in water law	ADB observes progress in MAWR dedication to reform before granting study tour. Short term MSc abroad training supported in any case	Local expertise in reform is tapped; eyes are opened to "what if" possibilities against context of local experience; public debate on natural resources management enhanced as an emerging water stakeholder's lobby finds its voice
	P1.2	WSRSU Trainers trained		Investment multiplied; leadership capacity in MAWR enhanced
	P1.3	Basin discussion forums with provincial / district authorities		WUA diplomacy skills increased, respect gained, bargaining position enhanced; resources flow from supportive authorities
	P1.4	BIO-Federated WUA contracts / training	WUAs federate as NGOs	Bottom up linkages & water lobby enhanced; water services improve
	P1.5	MAWR not to expect WUA community to provide ancillary ag functions	Private for-profit sector provides services	WUAs remain focused on main task; private service sector stimulated
	P1.6	MAWR removes gender bias in staff development	ADB promotes reform in gender bias reduction	Quality & sustainability of water projects improves as women take leadership roles
Legal	L1.0	WSRSU- Parliament subcommittee studies all water legislation & comments	EU TACIS land code support led to land reform	Water code support leads to water reform; confusion & conflicts over rights are reduced; rule of law improves
	L1.1	land market develops in 2008	S&ME credit investment in farming & agribusiness	Employment generated; land & water management improves due to ownership

Key: **turquoise & rose** – most strategic; **yellow**: likely; **green**: most impactful

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Category	No.	GoU Activity	External Support	Expected Outcome
Economic – Finance	E1.0	Support young talented staff recruiting w/ free housing & higher salaries	Fund agricultural economist MScs & mentored internships; leverage Germany's pilot water / env research in Khorezm	Foundation in market economics skills in agricultural sector is built; economic sustainability is enhanced w/ commitment to future educators
	E1.1	Farmers access ag economists for planning help; academic review of cost recovery studies	Support ag economics extension training	Farm budgeting the basis for profitability decisions; broader participation in cost recovery economics
	E1.2	Grant WUA technical base incl. water measure. when Min Justice NGO reg. completed	Loan support for water measurement at WUA turnout	Water conservation; basis for BIO-WUA water service charge; WUA management skill increases
Institutional	I1.0	MAWR outsider required to lead organizational re-orientation	PIU Public Awareness targets level I (Parliament & CabMin) w/ Project success stories	Reoriented MAWR
	I1.1	HR training for mid-career managers	Full time int'l management / training consultant in WSRSU	Future benefits begin with today's training investments
	I1.2	Local MSc in WUA Management w/ summer practical mentored internships in pilot WUAs	TIIM – Western water university partnership supported	Higher water education engaged as partner in reform process; WUA Manager career track initiated
	I1.3	WSRSU seeks more input on model charter from other previous pilot WUAs		More experience gained before model charter is further refined
Technical	T1.0	Make difficult choices about high electrical pumping costs	Support good technical –economic studies / models	Investment policy alternatives among difficult choices explored by progressive government
	T1.1	Systems approach to deterioration of irrigation & drainage infrastructure		
	T1.2	Assign HGRE to PAWD	TA for training & appropriate technology: on land reclamation monitoring	Land reclamation monitoring renewed at inter-canal & farm level
	T1.3	Develop PAWD extension capabilities in bioremediation trials on abandoned waterlogged & salinized lands	Support bioremediation research as alternative to infrastructure rehabilitation; stimulate market development for licorice / glycerin	Farmers return to abandoned lands; social / economic pressures in regional cities reduced; food security improved
Key: turquoise & rose – most strategic; yellow: likely; green: most impactful				