2014 | SECOND QUARTER

ICID NEWS

Managing Water for Sustainable Agriculture

MESSAGE FROM THE PRESIDENT

Dear Members and Friends,

Time flies so fast. We have only 3 months to go from now to the 22nd Congress and 65th IEC meeting of ICID in Gwangju, Republic of Korea.

ICID network covers more than 100 countries with diversified irrigation and drainage systems. We have large and modern irrigation system in many countries, and we also have small and aged irrigation system in developing countries. With social and economic development we endure the experience of irrigation development from small system to medium and large system, from single irrigation service to multiple use purposes. Water scarcity and competition for water has increased worldwide attention. Gradually, integrated water management is introduced with participation of all stakeholders.

In recent years, we have discussed whether small holder irrigated farmers have a future or not? It is certain that small holder irrigated farmers could get enough food for themselves from their irrigation land, but it is also true that they could not get adequate economic return from their small irrigated land. Although, small holder farmers are still popular in many developing countries, and continue to be so, but with urbanization more and more people are leaving rural areas and migrating towards urban areas. I certain countries, this provides a good opportunity for farmers' still living in rural areas to upscale their farms. In emerging countries this process is speeding up. There will be a huge need to improve irrigation services for farmer cultivating large farms. How to bridge the gap between this need and existing poor irrigation infrastructures and service will be a big challenge to irrigation system management organizations. This change process needs to be considered during the planning of irrigation system modernization.

With social and economic development irrigation system also endure the change of water uses, from single irrigation purpose to multiple purposes, not only including irrigation, but also water supply for: domestic needs; industry; small hydropower; and environment etc. Therefore, it is important to consider and include all water users as beneficiaries and share costs while planning modernization of irrigation systems. This is important to increase irrigation systems profitability, equality, dependability, and sustainability.

Groundwater is the major water source for irrigation, usually for small irrigation systems, hence, irrigation management is also easy. However, in many areas farmers are suffering from over utilization of groundwater and they have to invest to dig deep wells and buy high lift water pumps. If they use surface water for irrigation, irrigation system is usually large and complex, and specialized irrigation management team is needed. For medium and large irrigation systems, conjunctive use of surface water and groundwater is important measure to enhance water source and achieve sustainability.

To increase the water use efficiency and water productivity we have to consider the reuse of water in the irrigation system. Collection and reuse of return flow or tail water is an effective way to increase water use efficiency and productivity. Water losses at the small scale is the source at larger scale, such as water percolation on farm is the source for groundwater recharge. Therefore, for the assessment of water use efficiency and productivity, we need to consider the scaling up effect of irrigation system. Hence, we need to balance the measures taken at farm level, irrigation system level, and basin level, in order to increase water use efficiency, water productivity and sustainability while minimizing the input to achieve this purpose.

Revitalizing irrigation is very necessary to achieve food security and rural development under global changes, including climate change, population increase and urbanization, etc. Revitalization of irrigation system includes modernization of existing irrigation system and development of new irrigation system. In many countries modernization of irrigation system will be a highlighted area for investment. During the First World Irrigation Forum (WIF1) last year in Mardin, Turkey many related issues and topics were discussed.

The theme of the 22nd ICID Congress is "Securing Water for Food and Rural Community under Climate Change". We have about 200 papers/posters to discuss how to take integrated actions to cope with the climate changes. It is expected that we will further explore and enrich the ideas and outcomes from the WIF1 and contribute to secure water for food and rural development in sustainable manner.

ICID's mandate is dedicated to enhancing the worldwide supply of food and fibre for all people by improving water and land management and the productivity of irrigated and drained lands through appropriate management of water, environment and application of irrigation, drainage and flood management techniques. Now ICID's domain is getting bigger and bigger, which includes our National Committees, direct members, international organizations, research institutions and individual experts. The ICID event is also our annual opportunity to meet and share knowledge and information to achieve food security.

I invite all of you to attend the 22nd ICID Congress scheduled to be held from 14-20 September 2014 at Gwangju, Republic of Korea. We will have a great event with good memorries of Korea.

I wish you a pleasant summer and look forward to seeing you soon.

Best regards to all of you,

Yours truly,

Gao Zhanyi

Gao Zhanyi
President of ICID

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Inside

Irrigation Development in Iraq

Republic of Iraq located in the Mesopotamian alluvial plain, the northwestern end of the Zagros mountain range, and the eastern part of the Syrian Desert. Iraq borders Turkey to the north, Iran to the east, Kuwait to the southeast, Saudi Arabia to the south, Jordan to the southwest, and Syria to the west. Iraq has a narrow section of coastline on the northern Persian Gulf. Two major rivers, the Tigris and Euphrates, run through the center of Iraq, flowing from northwest to southeast. These rivers provide Iraq with agriculturally capable land and contrast with the steppe and desert landscape that covers most of Western Asia. The region between the Tigris and Euphrates rivers is often referred to as the cradle of civilization.

Introduction

The first specialist irrigation office was established in 1918, to regulate irrigation, construction of dams and irrigation schemes, flood management and river training works, and management of water at field level etc. The irrigation system in Iraq is one of the most complex water distribution systems in the world and now the Ministry of Water Resources has assumed the responsibility for integrated management of water resources in Iraq that strives to ensure the rational distribution of available water to meet the current and future requirements for irrigation, drinking and domestic needs, industry, and environmental and ecological needs in addition to hydropower and flood control.

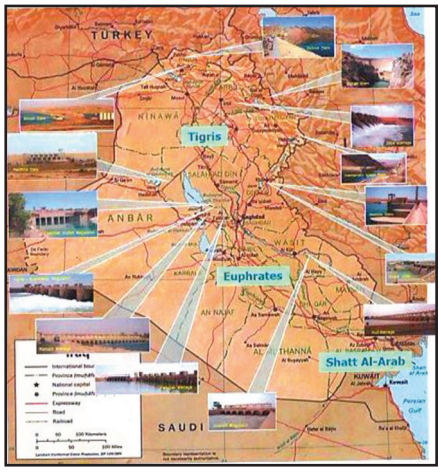
Water Resources in Iraq

Iraq is one of the Middle East countries overlooking the Arabian Gulf. Its land area of 43.83 million hectares is divided into four regions: plains 30%, undulating land 10%, mountains 21%, and deserts 34%. It shares border with 6 countries.

The climate of Iraq is dry at medial and in southern areas and semiarid in northern area and this effect significantly on its water resources Because of, scarcity of rain and high evaporation rates, the agriculture depends on surface water resources.

The surface water resources in Iraq are limited and are in precarious quantities because of many factors:

- Increase the number of residents,
- Effects of climate changes,
- Water policies of upstream countries, and Withdrawals of water their irrigation projects especially, dams and reservoir.



Tigris and Euphrates and their tributaries and Shatt al-Arab account for about 93% of the total water resources in Iraq. Most of the feeding river basins are located in downstream countries of Tigris and Euphrates outside Iraq's borders. The water inflows of Tigris river from (2000-2011) reached (33) billion m³ for every year, and in Euphrates river during the same period reached (15) billion m³ for every year.

The groundwater is estimated as 7.4% of the total water resources in Iraq and the renewable groundwater has been assessed as 4 billion m³ yearly. The ground water recharge has been reducing significantly over the last thirty years because of scarcity of rain and non-sustainable use. In order to meet the water needs of all the sectors water storages consisting of 9 large dams, 22 small dams and 18 weirs as per the requirements have been constructed in the government sector and through the Ministry of Water Resources which has assumed the responsibility of creating and managing storage and distribution of the raw water for different sectors.

The population of Iraq is 34 million and the per capita water availability is 1400 m³/person/year and all the surface water resources are utilized, regardless of bad quality of water because of the high levels of salinity. Taking into consideration the quality of water the per capita availability of is less than this much.

Irrigation and Drainage in Iraq

The dams, diversion weirs and water supply projects cover more than 3.25 million hectares land area in all Iraq which consumes nearly 90 % of water resources.

The land area suitable for farming in Iraq is estimated to be 11 million hectares of which about 6 million hectares has been utilized in agriculture and the rest remains unexploited for agriculture because of the inadequate water and non-use of modern irrigation methods. About 3 million hectares is irrigated from Tigris and Euphrates rivers, and about 2 million hectares is under rain fed cultivation most of these lands are located in the north of Iraq.

The area utilized from drainage system in Iraq is about (1.5) million hectares. The aim of the drainage system is to reclaim and prevent high salinity in the areas located in the middle and south in Iraq caused due to adoption of unscientific irrigation processes in cultivation of palm groves and different kinds of seeds, vegetables and trees.

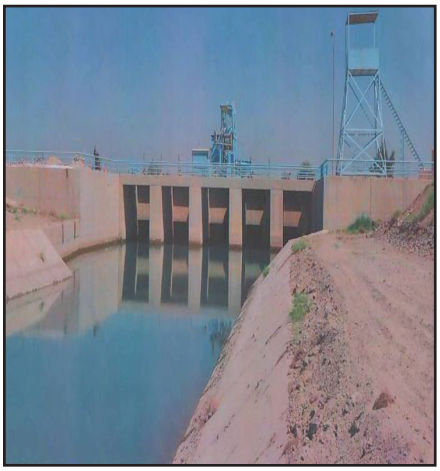
Use of Modern Technology

In order to reduce water losses, Iraqi Ministry of Water Resources is seeking to use advanced technologies to adopt Integrated Water Management through a number of projects as follows.

Implement Remote Control System in Holy–Al-Najef Governorate.

It is one of the pioneering projects that are being executed in six governorates in the first phase. It's preparing for executing another six pioneering projects within the second phase. It is hoped to use modern irrigation techniques in all Iraqi Governorates.

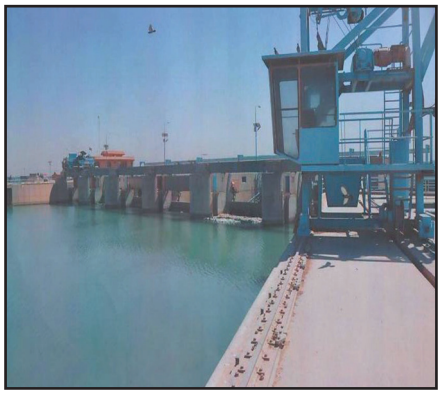
The aim of the project is to distribute water shares between farmers equally. It serves an area about 2500 Donums. The work included replacement of old mechanical gates with the ones manufactured from Aluminum which is operated by using Solar Energy (Alternative Energy).



Installing and Operating Hydrological Stations

Under this project, the government has installed hydrological stations to monitor dams, reservoirs and sites on Tigris and Euphrates Rivers and on Iraqi marshes. The aim of this project is to provide data base on available water storage and discharges every season with a view to prevent water losses and wastage which reduce water storage. These stations have great importance for operating and controlling water resources in Iraq. The work of stations includes measuring water levels. Some of them have sensors for measuring water quality parameters (sediments load, salinity and acid level and Dissolved Oxygen) in every 15 minutes. The readings are transmitted to the stations by satellites and transferred for decision makers' for arriving at appropriate procedures in distribution of water of main rivers and streams.

In addition, Al-Raad research station carries out studies on various aspects of irrigation management in Iraq in different areas. The



station, established in 1965, is located west of Baghdad and carries out studies and research works in the following:

- Studying crop water requirements,
- Applying different irrigation systems and its efficiency,
- Develop rice irrigation methods to increase water use efficiency and reduce losses,
- Effecting saline lands on crop productivity,
- Studying saline soil and how that effects plants and suitable washing requirements,
- Use saline water in agriculture with different technical methods, and
- Studying weather elements.

About Iraq National Committee on Irrigation and Drainage (IRQCID)

Iraq joined ICID in 1950, as a public voluntary organization bringing together various stakeholders in Iraq irrigation and drainage sector to further the objects of IRQCID sponsored by the Government of Iraq.

IRQCID has given one Vice President in the past, namely, A.Al-Rawi (1978-1980), and Eng. Kadhim Mohsin Ahmed was elected as Vice President for the period (2013-2016). The National Committee members consists Eng.Mohammed Thary Jasam, Eng. Mohammed Ameen Faris, Dr. Hussen Laibee Zamel.

Integrated Water Resource Management (IWRM) Approaches for Sustainable Food Production

ICID News 2013 (Fourth Quarter) has provided summary of the key outcomes of the Strategy Sub-themes "Policy, science and society interactions", and ICID News 2014 (First Quarter) "Challenges and Developments in Financing Irrigation and Drainage Sector" as part of First World Irrigation Forum (WIF1) held at Mardin, Turkey from 29 September to 5 October 2013 to our readers. In this edition, a brief outcome of the 'Integrated Water Resource Approaches for Sustainable Food Production' is provided to our readers.

Agricultural production needs to be expanded in order to feed a growing and increasingly rich and urban population. Environmental concerns related to over exploitation and poor management of water resources are growing. Loss of vital ecosystems services in some areas may threaten the sustainability of the land and water resource base on which agriculture depends.

Principles of IWRM are succinctly described as the desired maximization of the 3 E's: Economics, Equity and Environment. Because these three objectives are not always achievable simultaneously, water management needs to involve trade-offs more often than usual for maximization. Greater pressure on water resources and, hence, stronger interconnectivity between sectors sharing these resources, calls for new, integrated approaches to agricultural water management. It is necessary to explore the links between water, food, energy, and climate.

Irrigation and drainage potentially provide important ecosystems services. Though its

primary goal is food production, other provisioning services are also included like the provision of fish and wood (from trees along canals and water bodies within and outside the command area). Climate change policies also indirectly affect water allocation and use. For example, because of high energy prices, concerns over GHG emissions and geo-political considerations, several countries set bio fuel targets as part of their energy/climate policy. Bio energy is expected to increase the demand of agricultural produce, in order to increase the supply of transport fuels (i.e. bio-fuels).

Water overarches the complex land, food and energy nexus as it is essential to sustain life and to meet the multiple demands of society's endeavours. To help understand the nexus better, it is important to keep certain facts in mind. Though agriculture uses only 11% of the world's land surface, it is currently the largest user of water, accounting for about 70% of total


Norris Dam, USA

withdrawal on the global scale mainly through irrigation. The food production and supply chain also accounts for about 30% of the total global energy demand. Estimates suggest that by 2050, global food production will need to be increased by as much as 60 per cent. Achieving such a dramatic increase is a steep challenge, especially in view of low productivity in the poorest countries productivity can be as low as one-fifth of the potential.

However, experience from the past shows that economic growth does not automatically ensures food security. According to some assessments, 870 million people are undernourished, many of them because of a lack of access to food. Hunger can persist in the midst of adequate national and global food supplies. In this light, increasing food production is not sufficient on its own to achieve food security and eradicate hunger. Efforts to promote food production must be complemented by policies that enhance households' access to food.

Since 1960, the extent of land under irrigation has doubled. As estimated, there are currently 300 million hectares of irrigated land worldwide. The direct and indirect power requirement of irrigation necessitates higher electricity consumption. But the demands does not stop there. The indirect energy demand is substantial for operating farm machinery, for manufacturing fertilizers, and so on. The bottom line is that agriculture is heavily dependent on the energy sector.

Policies to ration farm power supply can be a way to encourage farmers to use water more sparingly. Modernization of existing canal irrigation systems may also encourage farmers to reduce their groundwater use.

But agriculture is not only about energy consumption, it can also help to generate energy, through bio fuels. From a developing country perspective, bio fuels have the potential to provide a clean alternative energy source to fossil fuels. However, the optimism regarding bio-fuels has to be balanced against increasing concerns over their economic viability and actual implications for socio-economic development, food security and environmental sustainability. The potential impact of bio-energy production on water resources is of major concern, especially where bio fuel crops are to be grown on irrigated land. The water requirements for bio fuels produced from irrigated crops can in fact be much greater than those for fossil fuels.

According to a recent report as much as half of all the food produced in the world – equivalent to two billion tonnes – ends up rotting in landfills as waste every year. Avoiding food wastage and implementing other efficiency measures now can free up water, energy and land resources that will be critically needed to meet future food demands.

Irrigation technologies have an important role to play in moving towards food security for the growing global population. We will need to make more common use of knowledge-based precision irrigation along with deficit irrigation and wastewater reuse. In combination, these three techniques form a solid platform for sustainable intensification of agriculture. Keeping in mind that crops often take up only half of the irrigation water applied to them, priority should be given to better designing of mechanical irrigation systems for greater water efficiency. Efficient measures can be applied at all stages along the agri-food chain, for example at the farm. Water and energy management can meet in securing socio-economic development. If water, energy and food security are to be simultaneously achieved, decision-makers must consider the impacts of their actions beyond their own sector or sectors and ensuring close linkage between water, food, energy and land.

OUTCOMES

1. Water, food, energy and climate are not only linked but interdependent on each other. Water management, if undertaken in isolation would leave important developments outside water sector - food and energy production in particular.
2. Agriculture is found to be the largest contributor to non-CO_2 GHG emissions and it is suggested that its mitigation is possible through improved water management.
3. Ecosystems services which are directly not visible such as ground water recharge, reduction in soil erosion, biodiversity support, flood retention and carbon sequestration - but do contribute towards environment, need to be identified.
4. Green economy is well dependent on food-water-energy nexus but it cannot be easily achieved just by optimizing energy, water and food use.
5. Supply Chains - water supply chain, energy supply chain, and food supply chain have to be used for better understanding of the interdependency of food, water and energy in order to map out the flow of resources and goods with the objectives to improve the physical and/or economic environment of the chain.
6. In order to cope with climate change it should be recognized that the impact is highly variable and not universal.
7. There is need to integrate the government departments for EIA assessment so as to make work countable and to reduce administrative confusion.
8. Establishing effective governance structures and clear policies to facilitate the integrated management of energy, water, and agriculture systems is an essential requirement.
9. As conflicts about sharing of water among the countries located in international river basins, as also between users in different sectors have become global issues, it is suggested that water security should be put on agenda of UN Security Council.

ICID's Strategy for the 7th World Water Forum

Strengthening horizontal and vertical linkages to other sectors/stakeholders

VPH Shinsuke Ota
Chairman, Task Force to Guide ICID Inputs to the 7th World Water Forum (TF-WWF7)

"Horizontal expansion" and "vertical expansion" are terms often used to illustrate policy direction for irrigation development. Horizontal expansion aims to increase production by installing new irrigation systems to rainfed farmlands or newly reclaimed lands. Vertical expansion, focuses on yield increase through better water management coupled with introduction of new varieties, fertilizers and pesticides. The TF-WWF7, would like to apply these notions to ICID's contribution to addressing world water issues.

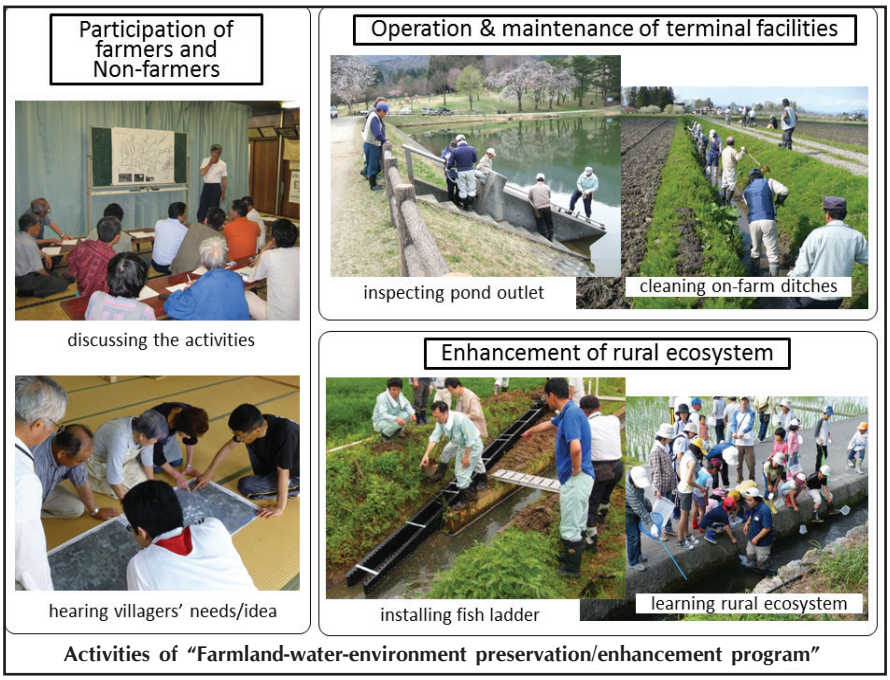
While looking into the vertical relations within irrigation sector, it is obvious that no irrigation and drainage policy will take root in the field and that no project will be implemented without farmers' recognition, cooperation, and political support. In order to engage from farmer to politician, ICID organized the first World Irrigation Forum (WIF1) at Mardin, Turkey, in 2013, under the initiative of President Gao. Farmers' leaders and irrigation practitioners from various countries came to the Forum, and their remarks were indeed an eye opener.

In Japan, Land Improvement Districts (LIDs) are in charge of operation and maintenance (O&M) of irrigation and drainage facilities. Should the need arise, the LID leaders strive to convey the current situation of the facilities and urgent requirement of fundamental improvement to the relevant authorities. Irrigation sections in local governments, along with the Ministry of Agriculture, Forestry and Fisheries (MAFF), also routinely keep an eye on the condition of water management and facilities, and visit the relevant LIDs to hear their problems. LID leaders also seek the support of politicians who are prepared to listen to the leaders' voices and to take necessary actions, in close collaboration with engineers. Sharing information and needs in the field is key to the success. Here, irrigation and drainage engineers act as effective interpreters and proposers, for both farmers and politicians. VPH Ota looks forward to the participation of more politicians and farmers at 7th World Water Forum and the Second World Irrigation Forum (WWF2), to be held in 2016 in Chiang Mai, Thailand.

On the other hand, by horizontally linking with other sectors/stakeholders, one can avoid unnecessary conflicts for the benefit of each other. It seems to be a trend to organize international conferences focusing on generating new streams to trigger chain reaction for better coordination. In March 2014, the Asia Pacific Regional Symposium for World Water Day on The Water-Energy Nexus in Asia was held in Tokyo. In October 2014, the Water and Energy International Conference will be held in Lyon with a theme on "International symposium: Water & Energy interactions: Strategic challenges to territorial development and their impacts on food and health". ICID should actively take part in these important meetings and send a strong message to show the willingness to cooperate with other sectors, because water issues cannot be solved by irrigation sector. This is especially true when we think about attainment of MDG/SDG*.

The steering committee that prepared IWRM** Guidelines for UNESCO, tried to incorporate the importance of mutual understanding among sectors/stakeholders into the guidelines, by clearly mentioning sectoral perspectives. The guidelines are composed of the main volume "The Guidelines for IWRM Coordination" and a set of volumes for each sector, including a special volume for "Invitation to IWRM for Irrigation Practitioners." In the main volume, interests of the agricultural sector are described as: "Water, together with land, is only an instrument for agricultural production. The production outputs are food and ultimately revenues for the farmers. For farmers, water is a means of ensuring their living on their land." Thus the agricultural sector's concerns can be understood alongside other perspectives. Equally important are our efforts to understand other sectors/stakeholders perspectives.

An example from Japan regarding bidirectional (both vertical and horizontal) expansion policy applied to the terminal irrigation/drainage facilities management in Japan: "Farmland-water-environment preservation / enhancement program", is worth sharing. This program was introduced in 2007, based upon the recognition of MAFF that highlighted the decreasing number of paddy producing farmers, who share the burden of the terminal facilities, would adversely affect their proper O&M. The core concept lies in mobilizing non-farmers to the O&M activities – not only for the sake of agriculture, but for their better village environment. At present, more than 18,000 activity groups have been set up by farmers and non-farmers covering 46% of paddy fields area in Japan, and these groups are actively engaged in



Activities of "Farmland-water-environment preservation/enhancement program"

* Millennium Development Goals/Sustainable Development Goals

** Integrated Water Resources Management

various activities including conserving eco-system and enhancing village environment, making use of farmland and farm ditches as their common social capital. Thus, the program proved to be effective in averting the negative impact of the decreasing number of farmers to the O&M of the terminal facilities. Key to the success of the policy: drawing non-farmers' attention to their concerns, and thus giving respective activity groups a free hand to consider their own objectives and decide what to do.

The irrigation sector remains the biggest water user, sharing 70% of the total water use in the world. Therefore, irrigation sector should take responsibility for better water use and management. Within the sector, irrigation/drainage engineers should strive for better water use by frequent interactions with farmers, irrigation practitioners, politicians, and others. Efforts should also be made to understand the problem and share the problems with other sectors to gain the understanding and cooperation. Contributions from national committees, work bodies and other partners are invited to improve both vertical and horizontal development of ICID activities.

For more information, please contact VPH S. Ota <shinsuke-ota@r5.dion.ne.jp>

Karnataka Community Based Tank Management Project

This article is an extract from The World Bank in India news published in Volume 12/No.5, March 2014 issue. The Summary report contains Implementation Completion Report (ICR) of the recently concluded The World Bank project. The full text of the ICR is available at http://www.worldbank.org/reference/

Context

Karnataka has the second largest arid zone in India and relatively small proportion of irrigated area. Thus a large proportion of the population is dependent on highly variable rainfalls and arid zone water harvesting systems. There were over 20,000 small tanks, measuring between a few to several hundred hectares, mainly to provide irrigation to command areas, but also for multiple uses for livestock, water recharge, and household uses. However, institutions in the state did not have sufficient resources and systems to support tank rehabilitation, operation and maintenance.

Project Development Objectives

The overall objective was to improve rural livelihoods and reduce poverty through community based approaches for improving and managing selected tank systems. The focus was on improving tank systems to help increase water storage, water use efficiency, and agricultural productivity in areas where there is a large percentage of rural poverty in the state.

Project Beneficiaries

A total of 3,925 tanks were rehabilitated, and the estimated number of households served by the project tank systems was around 1.5 million.

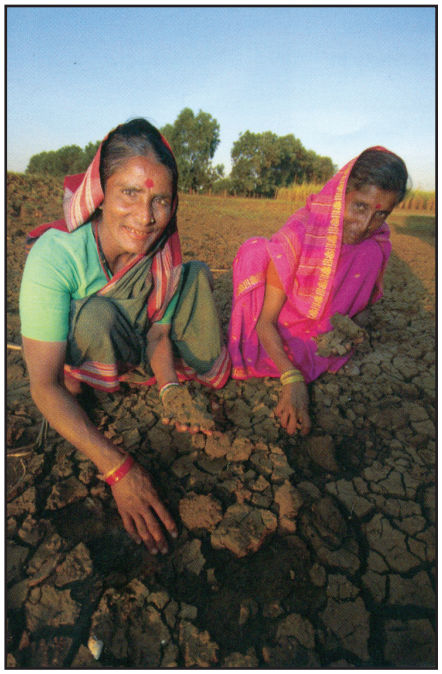
Achievements

(1) Self managed and sustainable tank users groups (TUGs) were established. By 2012, the project helped establish 3,126 TUGs covering 3,710 tanks (out of formal target of 3,925 tanks). Most TUGs managed funds, satisfactorily implemented tank rehabilitation and other activities - and most importantly were responsive to their members.

(2) Inclusion of marginalized groups. The project Management Information System showed 1.16 million TUG members (on average around 300 per tank) covering a wide range of farmers and other users. These included small, marginal and landless farmers, livestock keepers. Almost half of the members were women, 30 percent were from scheduled caste or tribe. Communities also picked the most marginalized to benefit from income generation activities, fisheries and resettlement support.

(3) Tank rehabilitation and resulting agricultural improvement. Tank rehabilitation led to improved water capture and use. Together with improved water management and agricultural practices, this led to a range of agricultural benefits, leading to improved livelihoods in a command area under the 3,710 project tanks for over 150,000 hectares. A project study showed a 20 percent increase in irrigated area, 44 percent increase in water volume, raised groundwater levels, and 23.percent improved water use efficiency. Farmers clearly benefited from the tank rehabilitation works, with total production increasing by 47 percent on average. Net income for farmers increased by 76 percent, compared to 42 percent for non-project tank farmers. (IAS 2012).

(4) Income increases from fisheries and other income generating activities. The project directly supported income generating activities, particularly for the landless and agriculture laborers. A large proportion of the allocated income generation activity support funds were channeled through women's self- help groups comprising about 99,453 beneficiaries. The IAS 2012 indicated that incomes of members improved by 56 percent. In addition, TUGs supported resettlement of 7,803 poor encroachers from farming tank bed areas and helped them in new livelihoods, often doubling their incomes. In 1,403 tanks about 7,800 landless (75 percent)



and marginal farmers (25 percent) were provided incremental income opportunities from the fisheries activities generating additional income averaging Rs. 5,179 per fisher household.

A number of unplanned outcomes also happened during the project period. The TUG federations emerged. Other projects and programs have adopted the basic community tank management model. In addition, the project also undertook specific rehabilitation works which involved restoration of ancient historical or religious related tank structures, and also repaired bunds in such a way as to provide road access for otherwise isolated communities (sometimes reducing travel time by over half a day).

Lessons Learnt

- The participatory process works very well and delivers results on the ground - and fosters further innovation.
- Well performing NGOs are the key to success of the approach. The NGOs play a key role in the success of a community based approach.
- New models and institutional mechanisms need considerable time and attention to start up and scale up. It requires greater realism and analysis of institutional issues and the gradual build-up of capacities based on experience. Significant institutional changes often require significant time of 8-10 years.
- It is important to allow for the project to cover several seasons, allowing for the occurrence of dry periods in order to understand how management can cover multi-year variability especially with resources such as water.
- Start simple and with tanks systems which are likely to be successful. The project had two underlying aims, to test a new approach to tank development and to provide support to disadvantaged areas, or communities. Having developed and tested the model, it could then have been expanded to more challenging localities and communities.
- There needs to be an institutional support system to continue testing and refinements in the model.
- Integrating tank management with agriculture is critical. This requires practical and sustained linking and coordination mechanisms between TUG farmers, participatory farmer groups, with support agencies, be they state departments, universities or other agencies.
- Good water management - linked to crop planning - is central to service delivery and thus in turn to fee collection. If the TUG is not providing a decent level of (water management) service, it is unlikely that water users will contribute to the costs of maintaining the service.

12th ICID International Drainage Workshop

23-26 June 2014, Pushkin, St. Petersburg, Russia

Summary Report

Drainage of agricultural lands is a critical issue in humid as well as irrigated lands around the world particularly the reclaimed lands of Europe. Drainage keeps these lands productive while keeping the interventions most ecofriendly. Very appropriately "Drainage on Waterlogged Agricultural Areas" was the topic chosen for the 12th ICID International Drainage Workshop hosted by Russian Committee for Irrigation and Drainage (RuCID) from 23-26 June, 2014 in the beautiful surroundings of Pushkin, a suburb of the historical city of Saint Petersburg. More than hundred drainage experts from 23 countries participated in the deliberations at the workshop among them, very importantly, some 20 young professionals. As an initiative to support the irrigation sector with young professions contribution, RuCID has sponsored 10 young professions to attend the workshop. The workshop was inaugurated by Deputy Minister of

Agriculture of the Russian Federation Mr. Semenvich Pavel Vladimirovich and President Dr. Gao Zhanyi. Mr. Alexsey Yakolnev, Acting Governor of St. Petersburg also welcomed the participants.

Drainage has played a key role in reclamation of land from sea, lakes and river deltas. The discussions at the workshop encompassed the topics of drainage designs and analysis methods, advanced equipment

and technologies for drainage construction, integrated approach to drainage control and environmental protection and its legal and socio-economic aspects. The historical surroundings of St. Petersburg, founded on the reclaimed lands of the Baltics, Neva River and the nearby marshlands provided live examples of the art and science of land reclamations practiced in this part of the world for over 300 years.

Today, around 3.5 million ha of agriculture land in Russian Federation is reclaimed. Large scale land reclamation works on water excess lands in Russia were taken up mainly during the period 1970-80 in order to increase the productivity of lands to pursue intensive agriculture. The reclaimed lands provided with drainage have undergone deterioration due to lack of maintenance of the drainage systems from 1990 onwards. Amelioration of reclaimed lands by improving its drainage conditions forms a crucial component of the measures to improve land fertility in order to fulfill the objective of Food Security Doctrine of Russian Federation, 2010. Federal target program "Development of agricultural land reclamation Russia for 2014 -2020 years" has been approved by the resolution of the Government of the Russian Federation from 2013.

As part of the practical demostration, the first technical tour organized on 23rd June was to Prinevskoe farm measuring 2500 ha, managed by a joint-stock company owned by some 390 farmers. The farm ranks among the top five farms in the region with an annual turnover of 1 billion Rubles. The farm has undertaken amelioration of the drainage system, partly funded by the federal funds and thirty percent from company resources. The farm is managed professionally and uses the latest technologies such as "unmanned aerial vehicle for land and crop monitoring" and "automated mobile field agro-meteorological units".

Later in the day the participants visited St. Petersburg Flood Barrier completed in 2011 to protect the city from regular high tides from the Baltic Sea and increasing sea levels due to climate change. The 25.4 km barrier consists of 11 embankment dams, six sluices and two navigation channels each with floodgates. Each of the pair of floating steel gates to shut the main navigation channel measures 122 m long by 23.5 m high by 4.7 m wide. The two gates are like two large submarines which are driven out into the channel, water is pumped in and they land on the sea bed closing the navigation channel, whenever the sea tides are above a critical level. The second channel is closed by a steel barrier that rises from a concrete slot at sill level and is 118 m long, 12 m high and 9 m wide. It can pierce through 600 mm of ice.

The technical tour after the workshop on 26th was to Velikiy Novgorod, the historic capital city of Russia. The importance given to drainage activities in the region can be gauged from the fact that the Deputy Governor of Nogrodoskiya himself addressed the experts followed by a presentation that gave an interesting exposure to the historic works of land reclamation started by Nikolay Ivanovi, a pioneer in the field of land reclamation in the beginning of 19th Century. It may be mentioned that out of the 610,000 ha of agricultural land in Novgordo region about 180,600 is the reclaimed agricultural land. The Russian Federation has taken up the amelioration works through a decree with the objective to complete these works by 2020. One such work undertaken in the region was visited. The participants also enjoyed the trip to Kremlin in the historical city of Novgordo.

The concluding session chaired by Prof. Nickolay Nicholovich Dubenok, Head of the Russian Agriculture Research and Chairman of National Commission of Irrigation and Drainage, was attended by Secretary General Avinash C. Tyagi among others. The workshop adopted a statement which recognized the need to modernize and ameliorate the aging drainage systems by using not only the technical innovations but also addressing the social engineering aspects through provision of advisory services and the need to organize special purpose inter-regional service providers. The participants also expressed the need for providing training to the drainage experts from developing countries and exchange of experiences with developed country experts.

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