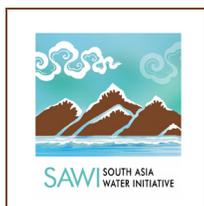




South Asia Water Initiative

Annual Report from the World Bank to Trust Fund Donors

July 2014 – June 2015





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The Hindu Kush Himalaya. NOSHIQ, ICIMOD -- The Maha Kumbh at Allahabad on River Ganges. Genevieve Connors -- The Hindu Kush Himalaya in Afghanistan. Christina Leb -- Buthan. Netopaek | Thinkstock.com

Inside Pages:

Page 14: Punjab Plains, Indus Basin. Laila Kasuri / World Bank -- Indus River. World Bank -- Indus Mountain. World Bank

Page 16: Ganges River. Genevieve Connors / World Bank -- Nepal. Simone D. McCourtie / World Bank -- Bangladesh. Scott Wallace / World Bank

Page 19: Bhutan. Curt Carnemark / World Bank -- Buthan Landscape. Flowminator | Dreamstime.com -- Bangladesh. Scott Wallace / World Bank

Page 22: Bangladesh. Thomas Sennett / World Bank -- Sundarbans Fisherman. Priyanka Chatuverdi / World Bank -- Sundarbans Boat Repair. Priyanka Chatuverdi / World Bank

Page 25: Regional Workshop. World Bank -- Himalayan Mountains. NOSHIQ, ICIMOD -- Regional Workshop. World Bank



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TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS	5
FOREWORD	6
1. Strategic Overview	7
2. Focus Area Summaries	13
Indus Basin Focus Area	14
Ganges Basin Focus Area	16
Brahmaputra Basin Focus Area	19
Sundarbans Landscape Focus Area	22
Regional Cross-Cutting Focus Area	25
3. Appendices	28
Appendix 1 – Summary of Activities by Focus Area	29
Indus Basin Focus Area	29
Ganges Basin Focus Area	29
Brahmaputra Basin Focus Area	31
Sundarbans Landscape Focus Area	32
Regional Cross-Cutting Focus Area	33
Appendix 2 – SAWI Results Framework and FY15 Performance	35
Performance Targets and Achievements for FY15	35
Outcome and Result Indicators	36
Program and Focus Area Indicator Targets	37
Focus Area Results Chains	43
Definitions	51
Appendix 3 – Financial Report FY15	52
Appendix 4 – FY15 Publications	55
Appendix 5 – FY16 Implementation Plan	56
Program Management, Communications & Knowledge Management	58
Indus Basin Focus Area	59
Ganges Basin Focus Area	61
Brahmaputra Basin Focus Area	64
Sundarbans Landscape Focus Area	66
Regional Cross-Cutting Focus Area	69

ACRONYMS AND ABBREVIATIONS

B	Billion
BRB	Brahmaputra River Basin
CoP	Community of Practice
EnGIO	Environment Governed Integrated Organization
FA	Focus Area
FY	Fiscal Year
FY15	Fiscal Year 15 (1 July 2014 – 30 June 2015)
GBM	Ganges-Brahmaputra-Meghna
GDP	Gross Domestic Product
GIS	Geographic Information System
GRB	Ganges River Basin
HEP	Hydro Electric Power
IDA	International Development Association
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resources Management
KRB	Kabul River Basin
km	Kilometer
M	Million
MDTF	Multi Donor Trust Fund
MoU	Memorandum of Understanding
MW	Megawatt
NGO	Non-governmental Organization
NHP	National Hydrology Project
SAWI	South Asia Water Initiative
WWF	World Wildlife Fund

FOREWORD

“Water is the number one global risk of highest impact in the next ten years,” according to the World Economic Forum’s 2015 Global Risk Report. Rising world population, urbanization and economic growth are placing increasing pressure on scarce water resources for food and energy security. Climate change is expected to exacerbate water challenges with increased variability in water availability both within and between years, especially in South Asia, where the likely impacts on the monsoon system are still poorly understood. In South Asia, a large fraction of the available water occurs in transboundary river basins. Increasingly, countries in the region will need to turn to these basins to meet growing demands. While there is a long history of tensions surrounding cooperation in water management in the region, there are currently important signals of political change that are leading to new opportunities for cooperative development and management of water resources.

The South Asia Water Initiative (SAWI) is a trust fund that aims to increase regional cooperation in the management of the major Himalayan river systems to deliver sustainable, fair and inclusive development in addition to climate resilience. The SAWI Trust Fund is managed by the World Bank and financed by the governments of the United Kingdom, Australia and Norway.

This Annual Report summarizes SAWI activities for the 2015 fiscal year. Over the course of the year SAWI has brought together policymakers, technical experts and key stakeholders—within individual countries and across the Region—to stimulate dialogue, inform policy, build capacity, and share new knowledge. The program is increasingly working toward supporting long-term basin development, and investment and regional cooperation in water resources management.

The World Bank appreciates the continued support of the governments of the United Kingdom, Australia and Norway, through their strong partnership in SAWI. The World Bank values the productive coordination among the partners of SAWI in fostering its objectives and program, which are closely aligned with the partners’ strategic vision and programs for the region.

The World Bank looks forward to the continuation of this collaboration to promote water as a catalyst of sustainable economic growth opportunities and regional integration in the coming years in South Asia.

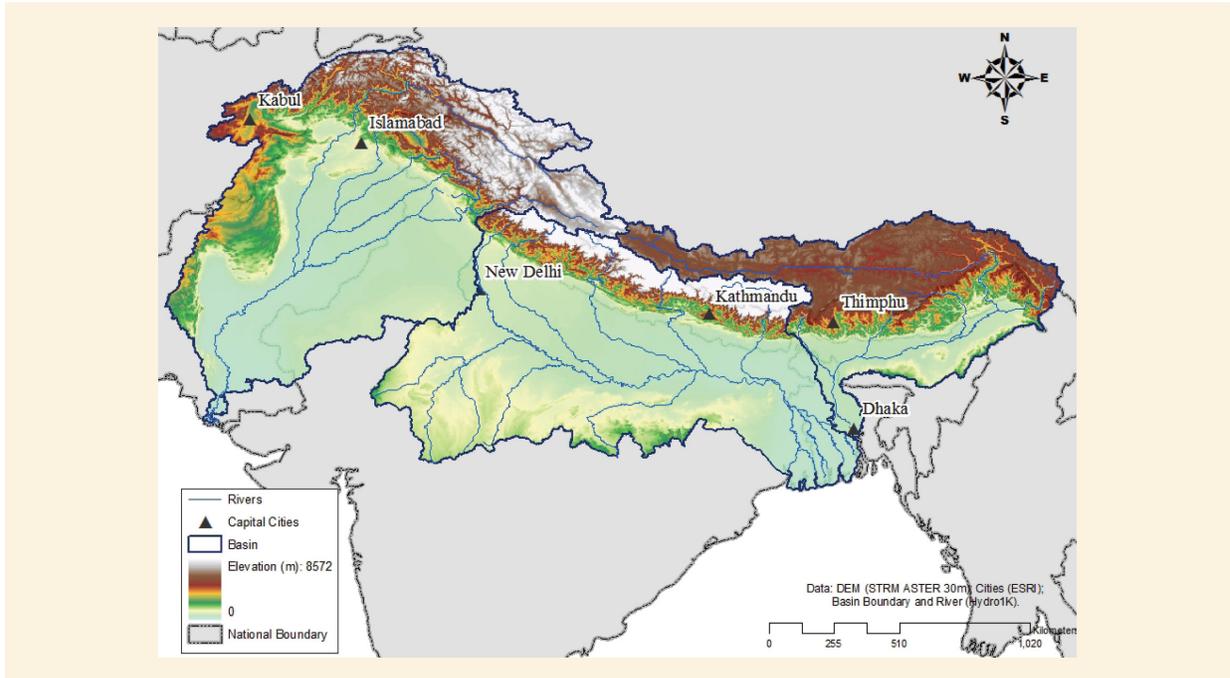
Akihiko Nishio
Director, Strategy and Operations
World Bank - South Asia Region



1. Strategic Overview



Strategic Overview



Established at the end of 2012, the second phase of the South Asia Water Initiative (SAWI) is a trust fund managed by the World Bank on behalf of the governments of the United Kingdom, Australia and Norway. The development objective of the trust fund is to increase regional cooperation in the management of the major Himalayan river systems in South Asia to deliver sustainable, fair and inclusive development and climate resilience. The program thus addresses poverty alleviation, gender and climate change issues in the context of river basin management, and these issues are expanded upon below. The major Himalayan river systems all span multiple countries (Afghanistan, Bangladesh, Bhutan, China, India, Nepal and Pakistan); SAWI supports activities relating to transboundary water cooperation in all of these countries.

The current bilateral trust fund agreements are for a five-year period, and hence the end of the Fiscal Year 2015 (FY15) marks the halfway point in the currently planned life of the program. The outcome indicators used by SAWI to measure achievement of the development objective relate to governance and investments in water resources management. For governance, SAWI aims to *inform* new or existing bilateral or multilateral governance processes. For investments, SAWI aims to: (i) *inform* new investments secured through bilateral or multi-lateral governance processes, and (ii) *improve* the quality of the planning processes leading to new investments; improvements may be through more approaches that are more participatory, better informed technically, and/or quicker. Given the geopolitical challenges of increasing regional water cooperation the targets for these indicators are focused on the final years of the trust fund life. Progress towards achieving the targets for the outcome indicators is described below.

Transboundary Governance

In terms of **governance processes**, SAWI is implementing several influential activities. For the Sundarbans Landscape, SAWI is directly informing implementation of the conservation-focused Sundarbans Memorandum of Understanding (MoU) between India and Bangladesh. Signed in September 2011, this MoU is for an initial period of five years; SAWI is working to ensure both parties agree in September 2016 to extend the life of the agreement.

The Farakka Treaty between India and Bangladesh is a thirty-year agreement for the sharing of the water of the Ganges that was signed in December 1996. SAWI is working extensively on activities to improve the understanding of the hydrology, water resources and ecological health of the Ganges River, and to raise the awareness and acceptance of the importance of data and knowledge sharing to support evidence-based participatory water resources planning and development. SAWI supported work in the Ganges Basin, including through informing the design of a loan to support improved water resources information and planning, is expected to become a leading source of new information and thinking that will guide deliberations by India and Bangladesh on future options for the Farakka Treaty. This could encompass cooperation on a broader range of water-related benefits (including flood management, inland navigation and ecosystem services) in a basin context rather than simply focusing on lean season water sharing arrangements.



Bangladesh. Photo: Scott Wallace / World Bank

Water cooperation between India and Bangladesh is guided by an Indo-Bangladesh Joint Rivers Commission established in 1972. As well as facilitating the discussions leading to the Farakka Treaty, this Commission has facilitated discussions on many joint rivers (including the Teesta) and has established arrangements for sharing of flood flow data. On the Bangladesh side, the commissioners are supported by the Bangladesh Joint Rivers Commission. In addition to the generation of new knowledge relevant to India-Bangladesh cooperation, SAWI is working actively through capacity building initiatives to support both technical and diplomatic capacity in both countries to enhance the quality and balance of water dialogue and negotiations.

SAWI is demonstrating improved approaches to flood forecasting that may offer new opportunities for sub-regional water cooperation between India and Bangladesh as well as the upstream riparian countries (Bhutan, China and Nepal). India and China have an active MoU on sharing of flood data for the Brahmaputra Basin that was renewed for a further five years in May 2013. A separate MoU was signed with China in October 2013 for "Strengthening Cooperation on Trans-border Rivers"; the implementation plan for this MoU (signed June 2014) extended by two weeks the period for which flood data on the Brahmaputra are shared. SAWI work on flood forecasting, and the technical data requirements for improved forecasting, has the potential to inform future revision to these MoUs.

India and Bhutan have for many decades cooperated on a scheme for hydro-met monitoring and flood forecasting on their joint rivers. The network supporting this includes 32 hydro-met stations in Bhutan operated by the Government of Bhutan with funding from the Government of India. In spite of good bilateral cooperation, infrastructure remains inadequate and the technical capacity in Bhutan is low. SAWI is therefore working to inform hydro-met infrastructure in the Brahmaputra with a focus on Bhutan, and is building capacity across the sub-region to improve operational flood forecasting.

In the Indus Basin, SAWI is supporting the governments of Afghanistan and Pakistan as they explore options and opportunities for cooperative development of the water resources of the Chitral/Kunar and Kabul river basins, in particular for hydropower generation. SAWI has also undertaken technical studies to ensure planning processes are based on improved technical knowledge, and is working with both governments to explore appropriate joint governance arrangements and to build the professional and institutional capacity for joint governance.

Facilitating Investments

In terms of **investments secured via bilateral or multilateral processes**, there are emerging opportunities in different parts of the region that SAWI is positioning itself to actively support. In the Sundarbans, SAWI is supporting the design of an integrated landscape-scale hydro-met monitoring network spanning Bangladesh and India. There are strong indications that Afghanistan and Pakistan desire to cooperatively advance hydropower investments in the Kunar Basin. In the eastern sub-region, discussions at multiple levels are exploring opportunities for investments to further develop the Ganges



and Brahmaputra rivers for inland navigation in ways that protect or restore the ecological integrity of the rivers. Such developments would not only greatly support commerce and trade between countries, but would improve people-to-people connectivity and thus facilitate deeper regional integration. Similarly, discussions are progressing at multiple levels on investments to improve power grid connectivity in the eastern sub-region to distribute energy from new hydropower investments, with new power trading agreements that could benefit the four nations of the sub-region. SAWI continues to participate where appropriate in relevant dialogue on these issues (especially in the technical “Track II” space) and facilitates sharing of relevant data and information to inform debate.

Cross-cutting Themes

Across the region as program implementation progresses, a number of key themes are emerging that will further enrich the water centric focus of the SAWI objectives and results framework. The first of these is poverty alleviation. Around 40 percent of the world’s poorest live in South Asia, and of these, around two-thirds live in the Indus, Ganges and Brahmaputra basins – concentrated especially in the Ganges Basin. The basic livelihoods of these people are intimately linked to water and water management,

through water supply and sanitation, irrigation for subsistence agriculture and often direct dependence on ecosystem goods and services including inland fisheries. As pressures on the water resource increases with population growth, urbanization and industrialization, the impacts on the poor are often most obvious and most severe through reduced access to water for basic needs and through reduced water quality with negative health consequences. In addition, the poor people of these river basins are among the world's most at-risk communities from recurrent flooding, which is a major factor in reinforcing poverty in the region. Improving water resources management should deliver firstly on more economically efficient, socially equitable and environmentally sustainable use of water, and secondly on mitigation of flood impacts, that together significantly contribute to poverty alleviation. Improved water management should also deliver increased water use efficiency, improved security of water access for basic needs, improved food and energy security and improved water quality.



Assam Flood. Photo: World Bank

Closely linked to poverty alleviation is gender, because the negative consequences of flooding, poor water management and increased water competition and pollution disproportionately affect women and children. Impacts are felt through time spent fetching water, washing and cleaning, and the dire health consequences of poor quality drinking water and poor sanitation, which are exacerbated by floods. Reducing the impacts on women in particular from flooding and poor water management can deliver significant health benefits, create opportunities for greater access to education for girls, and create greater opportunities for women to contribute economically through diversified employment opportunities. As well as identifying women as prime beneficiaries of improved water management, SAWI seeks to proactively engage women, in all its dialogue and engagement processes, in professional capacity building efforts.

The third emerging theme is climate vulnerability and resilience. South Asia is the region of the world with the largest number of people at risk from climate variability and change – vulnerability and exposure to climate impacts are already high and are expected to increase, including more extreme flooding (including from cyclonic storm surges in Bangladesh exacerbated by sea-level rise) and changing seasonal patterns of river flows driven by glacier melting and earlier onset of monsoon precipitation. On average, around 21 million people in the world are affected by river flooding each year, nearly 5 million in India (mostly in the Ganges and Brahmaputra basins) and 3.5 million in Bangladesh. India has the greatest total economic exposure to flooding (over US\$15 billion) while Bangladesh has the highest proportional economic exposure (approximately 5 percent of GDP). Recent assessments by the World Resources Institute suggest that by 2030, the number of people affected by flooding is projected to more than double across the Indus, Ganges and Brahmaputra basins, largely as a result of climate change. The economic cost is projected to increase three-fold in the Indus Basin and more than eight-fold in the Ganges-Brahmaputra basins, with socio-economic change the dominant cause but climate change a key contributor. Given these vulnerabilities, building climate resilience is emerging as a key development priority in the region. SAWI is increasing its efforts in improving flood forecasting and early warning systems, exploring options for improving the resilience of the Sundarbans Landscape in the face of a changing climate, assessing the consequences of warming on glacier melt processes, developing and piloting risk frameworks to deliver resilient hydropower development and operation under climate change, and beginning to explore opportunities for improved groundwater management as a critical

water resources buffer given the increasing variability and uncertainty of surface water resources. The nexus between these emergent themes (poverty, gender and climate resilience) provides a compelling rationale for increased effort in water resources management including increased efforts in regional cooperation.

Program Performance

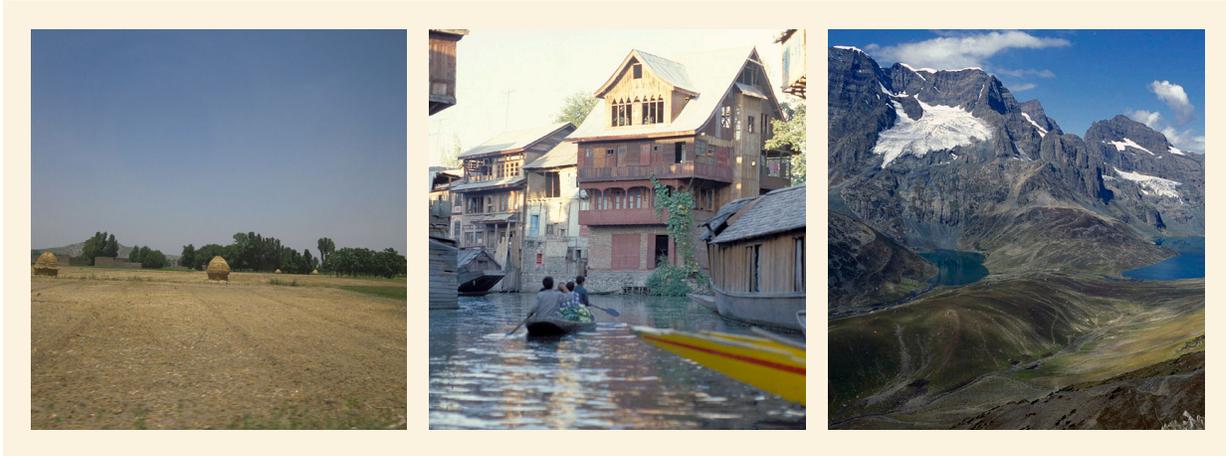
This report summarizes progress in FY15 in achieving the program's intermediate result targets. The program performed well in FY15 with all the program-level targets for all intermediate results indicators for the year achieved or significantly exceeded. This included major efforts on numerous technical and awareness raising workshops, study tours and capacity building events (directly engaging with over 500 professionals across the region) that lay a foundation for greater cross-border dialogue and knowledge sharing as the program matures. By the end of FY15 there were 28 active grants to approved activities. Cumulative allocation of funds to these activities by the end of FY15 was US\$19.3 million (over 60 percent of the entire fund). Total expenditure for FY15, was US\$2.63 million, and total expenditure over the life of the trust fund to-date is US\$4.84 million. Cumulative expenditure to the end of FY15 was 25 percent of the total funding allocated to-date to approved activities and around 15 percent of the entire fund. Projections based on program planning indicate funding allocations to approved activities will reach 85 percent by the end of FY16 and 100 percent by the end of FY17. Cumulative expenditure is expected to reach 40 percent of the total fund by the end of FY16 and 70 percent by the end of FY17.



2. Focus Area Summaries



Indus Basin Focus Area



Given complex water challenges, high glacier dependency and growing per capita water scarcity, the Indus River Basin is one of the most at-risk river basins in Asia. Glacier and snow meltwater currently contribute more than 40 percent of the average annual flow, but climate change is expected to significantly change the hydrological regime of the basin with potentially severe impacts for the basin population. The average annual flow to the Indus delta has been significantly reduced because of irrigation diversions upstream. Greatly improved water management and new investments (for water storage and hydropower generation) are needed to achieve water and energy security for the expanding population in the basin.

Because of the World Bank's role in the 1960 Indus Waters Treaty, and the importance of engaging in a neutral way in the basin, SAWI continues to maintain transparency on World Bank basin engagement. In response to communications from riparian stakeholders, the relative investment in this focus area (FA) has been decreased and the focus moved to areas and issues not falling directly under the purview of the Indus Waters Treaty. Activities focus on strengthening water resources management and coordination among riparian countries to improve water and energy security, especially where client demand is clear. These include: (i) capacity building for cross-border dialogue and facilitation of institutional development for joint hydro-electric power (HEP) development in the Kabul River Basin (KRB) and the Chitral/Kunar sub-basin; (ii) technical assistance to enhance transboundary water resources management capacity at the inter-provincial/state and national levels; and (iii) basin-level dialogue.

Building Trust and Confidence

The uneasy relationship between riparian countries, capacity asymmetry, and the fragility of post-conflict Afghanistan pose challenges for regional cooperation in water resources management. SAWI has supported a four-country basin-level dialogue since 2013 – the Indus Forum. The Indus Forum participants identified climate change as a promising entry point for cooperation and coordinated action, and thus the 3rd Indus Forum (Lahore, March 2015) discussed “Climate Change and Vulnerability of Indus Water Resources”. Participants included senior government officials and non-government experts from Afghanistan, China, India and Pakistan. The Forum established a working group (with at least two participants from each country) to develop a joint research proposal to strengthen the evidence base and

enhance the reliability of basin-level climate adaptation and resilience models in the region. The working group, through virtual discussions and a scientific study tour to China, is finalizing a research proposal that will be presented to national and international donors for co-funding.

Generating and Sharing Knowledge

In FY15, SAWI supported analytical work on joint river management in the KRB and reviewed investment opportunities for water and energy security. As part of this analytical work, regional, basin/landscape and sub-basin level knowledge products were produced and draft studies shared with key stakeholders for comment. Knowledge products include: (i) a synthesis note describing the opportunities and challenges of developing HEP in the KRB; (ii) a report on institutional options for transboundary water and infrastructure projects in the KRB, based on relevant international experience; (iii) a strategic assessment for the KRB of water resources and hydropower production potential under a range of operational and climate change scenarios; (iv) geospatial analysis of the KRB based on remotely sensed data; and (v) a review of existing technical assessments and feasibility studies for the KRB. This work helped build momentum in both Afghanistan and Pakistan for joint HEP development in the KRB.



China Study Tour Group Discussion. Photo: Christina Leb / World Bank

Building Institutional Capacity

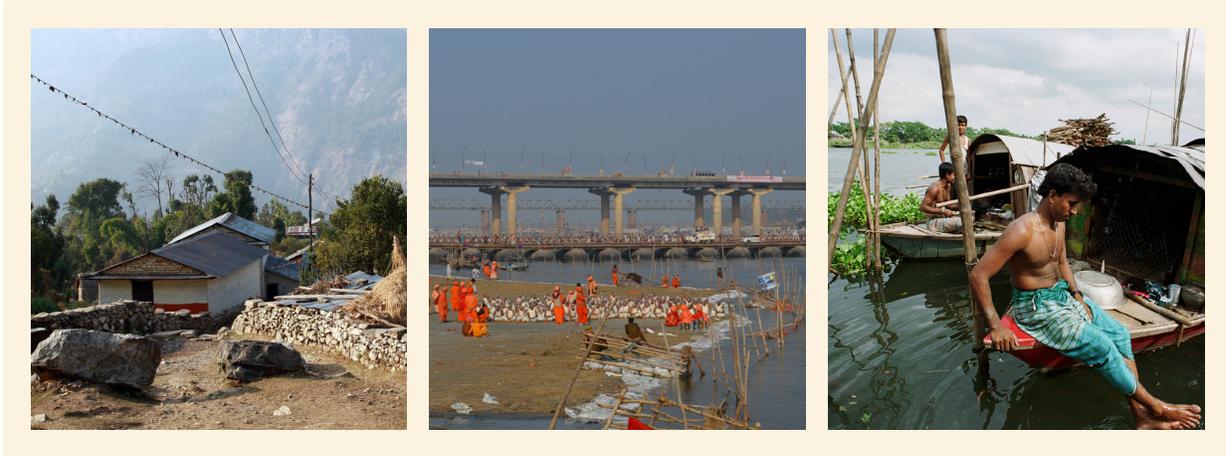
SAWI provided technical assistance and implementation support to projects in both Afghanistan and Pakistan to build water resources management capacity. This informed the preparation of additional financing for two projects involved in the management of shared river basins and transboundary water governance: the Water Sector Capacity Building and Advisory Services Project (WCAP) in Pakistan, and the Irrigation Restoration and Development Project (IRDP) in Afghanistan. WCAP is currently tackling transboundary water resources management at the inter-provincial level, but with the growing interest, KRB opportunities expansion into international transboundary water management is expected. IRDP is supporting inter-ministerial institutional capacity building for transboundary water management. SAWI is providing complementary support for the design and implementation of a training curriculum.

Scoping Interventions and Investments

Analytical work on KRB HEP development potential has identified opportunities for joint or coordinated investments by Afghanistan and Pakistan. The KRB has the potential for several hydropower and multi-purpose projects on both sides of the border, with an aggregate generation capacity of about 3,000 MW. These developments would also help control floods in the Kabul River and improve the utility of the existing Warsak Dam on the Kabul River in Pakistan.



Ganges Basin Focus Area



Countries are unlikely to cooperate for effective transboundary basin management if water resources are not well managed in river basins nationally. In South Asian countries, basin management of water resources is in its infancy. In the Ganges Basin, SAWI is therefore actively supporting adoption of river basin planning within India and in Nepal, and connecting between countries through dialogue processes and capacity building. Strengthening river basin planning in India is especially important for two reasons. Firstly, India has many inter-state river basins that have been the focus of extended water disputes, but increasingly the country is recognizing the need to adopt a more cooperative approach to river basin management. Secondly, India is the dominant country in the Ganges Basin and so it is important for Indian water planners and policy makers to have a sound understanding of the benefits of basin-scale planning and management, without which increased longer-term water cooperation with riparian neighbors in the region is unlikely.

Building Trust and Confidence

In both India and Nepal, there is increasing awareness of the importance of a river basin approach for managing water resources – both surface and groundwater. In India this is driven by multiple pressures – increasing relative scarcity, increasing water pollution and increasing competition for water among different sectors of the economy. While the World Bank has supported hydro-met data collection and river modelling across the peninsular states for the last two decades, there was no effort to tackle these issues in the international river basins. This is now changing fast, with the World Bank actively preparing a major “National Hydrology Project” with a strong focus on the Ganges and Brahmaputra basins. SAWI is providing technical support to the preparation of this program by bringing international best practice in river modelling and hydro-met technologies, and leading the policy dialogue with the central and state water ministries on river basin modelling, planning and management, and open access water information systems. SAWI is also providing support through a major international consultancy to demonstrate – in close collaboration with government – the river basin planning approach based on robust system modelling and analysis and multi-stakeholder consultation. These efforts are leading to greater sharing of hydrologic data and information, and increasing the internal dialogue on water management and cooperation in India among states, and between the central and state governments.

Generating and Sharing Knowledge

In FY15, SAWI established a Ganges Basin modelling “Community of Practice” (CoP) to connect non-government professionals around the world who are engaged in modelling the hydrology or water resources of the Ganges Basin. Members of the CoP include professionals from the UK, US, Australia, India, Bangladesh, Nepal and Sri Lanka. The CoP has been connected virtually through an online platform to facilitate the sharing ideas, data and information. A structured survey of members guided SAWI on how to best support the CoP going forward. Once the SAWI-supported international consultancy on strategic basin planning is fully established, it will be used as a focus for CoP activities. Subsequently, the CoP will be used as a means to engage with government officials (technical and policy) across the countries of the basin to share emerging basin understanding and to explore development and management scenarios. A review of published modelling work on the Ganges was conducted and a bibliography of modelling literature was shared across the CoP. A compilation of current models and modelling work was also prepared to describe the various models in use, their data requirements, licensing and access arrangements, and institutional support.

Building Institutional Capacity

In Nepal, chronic energy shortages that hamper economic growth and the environmental and social risks of an emerging pattern of uncoordinated HEP development are the key drivers for adopting a more strategic approach to hydropower planning. This in turn is leading to a recognition of the need to embrace river basin modelling and analysis to guide river basin planning. The World Bank is supporting the reforms and institutional capacity building required to enable this to happen, with important financial and technical support from SAWI. Since SAWI support in FY15 was largely tied to IDA support, this required prolonged negotiations and hence some delay. Implementation will now commence in FY16. In the interim, an important workshop was held in September 2014 in partnership with the Government of Nepal (GoN) to share international best practice in river basin modelling and planning, and to coordinate donor and NGO activities on this issue.

In India, the key political focus in the Ganges Basin is on Ganga “rejuvenation”. While perhaps originally seen as only a pollution “clean-up” program, it is being increasingly recognized as an integrated water quantity and quality challenge, and more importantly as an economic and social rejuvenation of the basin rather than just an environmental rejuvenation of the river. SAWI is providing active support through policy dialogue with central authorities, through participation in the multiple forums in India on Ganga rejuvenation, and through establishing a major international consultancy to demonstrate the consultative basin planning approach in a collaborative partnership with the central government.



Drain in Uttar Pradesh, India. Photo: The World Bank



National Workshop on Integrated Water Resources Management. Photo: The World Bank

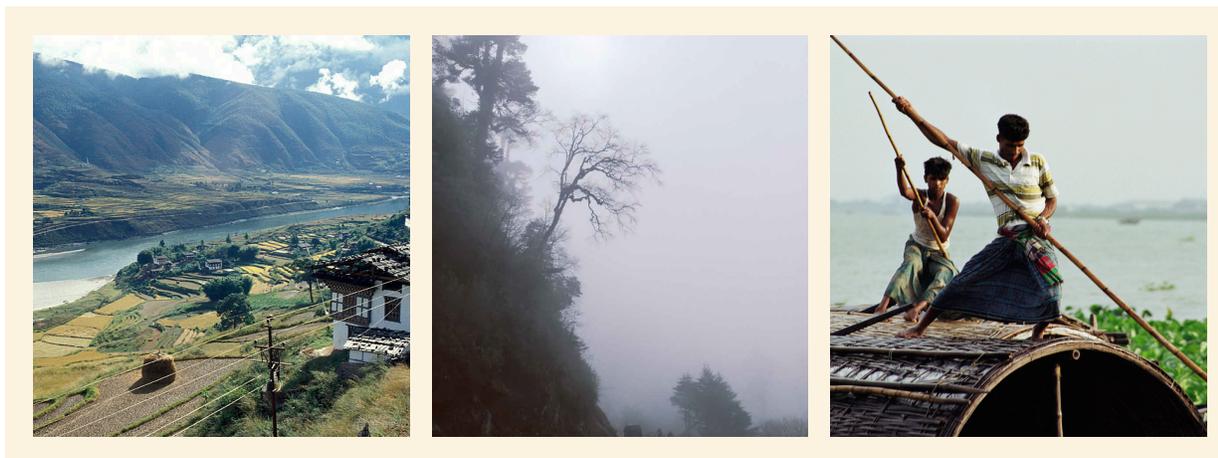
In FY15, SAWI supported major workshops in India to raise awareness of, and build capacity in: (i) modern basin modelling and analytical tools, (ii) technologies and methods for modern hydro-met data collection and management, and (iii) the concepts of and implementation approaches for Integrated Water Resources Management. Each of these workshops attracted over 100 people from across India. The first two workshops drew largely the same audience – primarily technical – while the third was a separate audience of senior planning and policy professionals. In each case, SAWI support enabled the participation of international experts from both technical and policy domains.

Scoping Interventions and Investments

Scoping interventions and investments is important for the Ganges Basin but has not been the primary focus in FY15. Rather, this will follow once modelling platforms and consultative process are well advanced. As indicated above, the work in Nepal will focus strongly on HEP investments, while in India the focus will be on interventions to improve river health, including prioritization of pollution mitigation works and measures and options for environmental flows.



Brahmaputra Basin Focus Area



Cooperative management and development of the Brahmaputra Basin – shared by China, India, Bangladesh and Bhutan – has thus far been lacking, with investment activities planned and undertaken in a piecemeal fashion at the country level. This has resulted in missed opportunities for economic growth and a general inability to tackle joint water-related challenges, including natural hazards (floods and droughts) and environmental threats (e.g., high rates of erosion and sedimentation). The varying capacities of the countries that share the Brahmaputra Basin and a prolonged history of mistrust has prevented cooperation for economic growth and resilience. Cooperation can only be achieved by leveling the playing field, working from the “bottom-up” (local, country, regional), while at the same time fostering “top-down” cooperative processes, including through knowledge sharing and dialogue. FY15 activities under SAWI focused on increasing the understanding of the complex river system, addressing common water-related challenges, such as flooding and erosion, and exploring potential economic opportunities from collaboration, including in hydropower. Knowledge exchange activities, study tours and workshops provided a critical platform for riparian countries to engage, build a shared understanding of the basin’s opportunities and risks, and begin to identify opportunities for basin-wide collaboration.

Building Trust and Confidence

In FY15, SAWI supported several activities that contribute to trust and confidence building in the Brahmaputra Basin. This included support to the “National Hydrology Project” – which includes the Brahmaputra and Ganges basins – described in the Ganges Basin Focus Area Summary. In addition, two major study tours to river basins that confront similar challenges to the Brahmaputra Basin were conducted in FY15. First, a study tour of the Yellow River in China (July 2014) was conducted involving officials from Bangladesh, Bhutan, India and Myanmar. The tour included visits to the Yellow River Water Resources Commission in Zhengzhou City and the Xiaolangdi Multipurpose Dam, as well as meetings with various officials from the Ministry of Water Resources in Beijing. Second, a study tour of the Mississippi River in USA (June 2015) was conducted involving senior officials from Bangladesh, Bhutan, and India. This included visits to the Mississippi River Commission, the US Army Corps of Engineers, the Engineer Research and Development Center, various levee boards along the Lower Mississippi River and the New Orleans District.



These study tours allowed participants to learn from international experience in river basin management, to gain a better understanding of common challenges and to discuss opportunities for collaboration, thereby providing an important first step towards greater cooperation in the Brahmaputra Basin. Following a request from China for a reciprocal visit to India to learn about water management in the Ganges Basin, a senior delegation from Anhui Province visited New Delhi in November 2014 to discuss shared irrigation and water resources management challenges with the World Bank and officials from the Government of India. SAWI is now actively exploring modalities for establishing a more formal basin-level forum (“Brahmaputra Forum”).

Generating and Sharing Knowledge



Field Visit, Classroom Conference to River Confluence. Photo: The World Bank

The Brahmaputra Basin is a highly complex yet very poorly analyzed or understood system. To help fill this void, SAWI is establishing the requisite knowledge base for informed investment planning and decision-making, including through the development of analytical and decision support tools and the strengthening of institutional capacity. While the aim is to build a comprehensive knowledge base that covers the entire basin, SAWI support in FY15 took a ‘bottom up’ approach and focused on areas where knowledge gaps are arguably the largest and where capacity is comparatively the weakest. This included closely linked

activities on river basin modelling in India, Bangladesh, and Bhutan (the latter focusing on hydropower development). In FY15, SAWI also supported knowledge generation and sharing in areas that are of common interest to riparians, including targeted work on erosion management (in India) and hydro-met modernization to improve disaster preparedness and build climate resilience (in Bangladesh). These national engagements have clear cross-border dimensions that require the basin-wide perspective that SAWI support is providing.

Building Institutional Capacity

Cross-country capacity building through the sharing of good practice in integrated water resources management was a central element of the study tours conducted. The Mississippi River study tour included exposure trainings on a range of analytical tools for flood management and sessions on institutional frameworks for basin management. Each of the activities that contribute to knowledge generation and sharing (refer above) include an explicit capacity building component, targeting areas such as modelling and analytical tools for basin planning, management and development. Under the Brahmaputra Focus Area, SAWI support is informing the preparation of a number of World Bank-financed projects that have direct and/or indirect regional linkages, each of which also includes work on institutional strengthening. Of these, the two-day “Classroom Conference to River Confluence” event held in Assam, India (January 2015), was a particular highlight. The event – held in collaboration with the Assam Water Resources Management Institute and the Indian Institute of Management (IIT-Guwahati) – provided a platform for academics and central and state government officials to identify key knowledge, institutional and capacity

gaps that exist in the Brahmaputra Basin and to chart a roadmap to tackle them. The event included extensive field visits and boat trips for consultative sessions with the local communities most critical to and affected by the management of the Brahmaputra Basin. The Classroom Conference culminated with a call to establish a Centre of Excellence in Assam that would address water resources issues across the northeast, including human resources and capacity building needs; this is under consideration by the central and Assam governments in India.

Scoping Interventions and Investments

The scoping of cooperative interventions and investments in the Brahmaputra Basin can only take place once the analytical platform and consultative processes are in place, and establishing these processes was the focus for FY15. Targeted SAWI support was provided at the country level for project preparation including support to the River Management Improvement Program in Bangladesh; the proposed Flood, Sediment and Erosion Management Project in Assam; and proposed hydro-met modernization for Bangladesh. SAWI's technical and financial support is improving project designs by enabling a basin-scale perspective that ensures transboundary impacts and opportunities are correctly identified and addressed.

This dual 'top-down' and 'bottom-up' approach – working concurrently at the basin level and at the country (and below) level – reflects the underlying SAWI philosophy: both regional cooperative processes and country-level support and engagement are equally critical for improving water resources management. This approach is adopted as countries are most likely to cooperate on clearly established and recognized joint concerns.



Community meeting, Brahmaputra Basin. Photo: The World Bank



Sundarbans Landscape Focus Area



In 2011, Bangladesh and India signed non-binding bilateral agreements for the joint management of the Sundarbans. These sit under an umbrella agreement with a framework for collaboration in international waters, information-sharing, disaster management and addressing climate change issues. SAWI support is designed to assist the two countries move from agreement to joint action. This will be achieved by funding: (i) advocacy to generate wider public support, (ii) joint research and dissemination to build capacity and build confidence for early joint actions, (iii) establishment of governance arrangements for joint planning, and (iv) development of shared plans and policies for conservation and sustainable development of the Sundarbans. The key ultimate expected outcome is shared or a coordinated approach to water resources management to underpin and promote sustainable development across the entire Sundarbans Landscape.

Building Trust and Confidence

In FY15, SAWI supported multiple events to build trust and strengthen working relationships between India and Bangladesh for sustainable management of Sundarbans, encompassing both country-specific needs and landscape-level priorities. An international “Risk Management and Adaptation to Climate Change for Sustainable Growth in the Deltaic Region” workshop was held in Kolkata, India (January 2015), in collaboration with the Disaster Management Department, Government of West Bengal, India, WWF (World Wildlife Fund) and EnGIO (Environment Governed Integrated Organization). A transboundary media workshop (aboard the *MV Paramhansa*) was organized for 28 media personnel representing prominent print and electronic media houses in Bangladesh and India (March 2015) to build trust and collaboration among the key media outlets in the two countries. The workshop held an introductory meeting with political delegates from India and Bangladesh.

SAWI organized informal meetings on water resources management in the West Bengal Sundarbans, and facilitated a workshop for ministers, members of parliament and civil society groups from Bangladesh and West Bengal (March 2015). The workshop considered how bilateral management mechanisms could best be established.

SAWI is supporting targeted environmental studies that are helping to build confidence and momentum for a Sundarbans “Joint Platform” for guiding long-term planning and collaborative work. Initial work has included studies on livelihood implications of climate change in the Sundarbans and studies on flora and fauna at risk in a changing climate.

Generating and Sharing Knowledge

Both the international workshop and the transboundary media workshop described above were important knowledge sharing events. The international workshop focused on sharing global scientific knowledge with regional decision makers. It provided over 100 policy makers and experts with an overview of the disaster risks and climate change induced risks to the Sundarbans, shared experiences from other deltas in mitigating natural disasters and sea level rise impacts and in achieving sustainable development and climate resilience. Key workshop recommendations include: (i) mainstream climate change ecosystem based disaster risk reduction approaches into policies and development planning, (ii) enhance scientific and technical work on disaster risk reduction, (iii) ensure the use of traditional, indigenous and local practices to complement scientific knowledge in disaster risk assessment, and (iv) encourage parliamentarians to support disaster risk reduction by developing new or amending relevant legislation.

Participants in the transboundary media workshop discussed and prepared a first draft of a media collaboration plan, planned ways to sustain media coverage on joint management of the Sundarbans and began development of a transboundary Sundarbans media strategy. Field visits exposed participants to fishing communities, forest camps; village-level climate change impacts; integrated livelihood management and ecotourism; and ecosystem dynamics and ecosystem services. An introductory meeting with political delegates from India and Bangladesh was held. Media workshop recommendations address: (i) communication and knowledge management issues, (ii) policy and technical issues and (iii) environmental and social issues. Smaller subsequent media discussions are helping to advance the agreed actions.



Building Institutional Capacity

During FY15, SAWI facilitated discussions with the Government of Bangladesh on the scope of “Delta Plan 2100” (under which the Sundarbans Landscape is important for achieving higher and more resilient economic growth in Bangladesh) and on the broader scope of World Bank engagement in water resources management and development. These discussions contribute to strengthening the central government institutions for water management in Bangladesh.

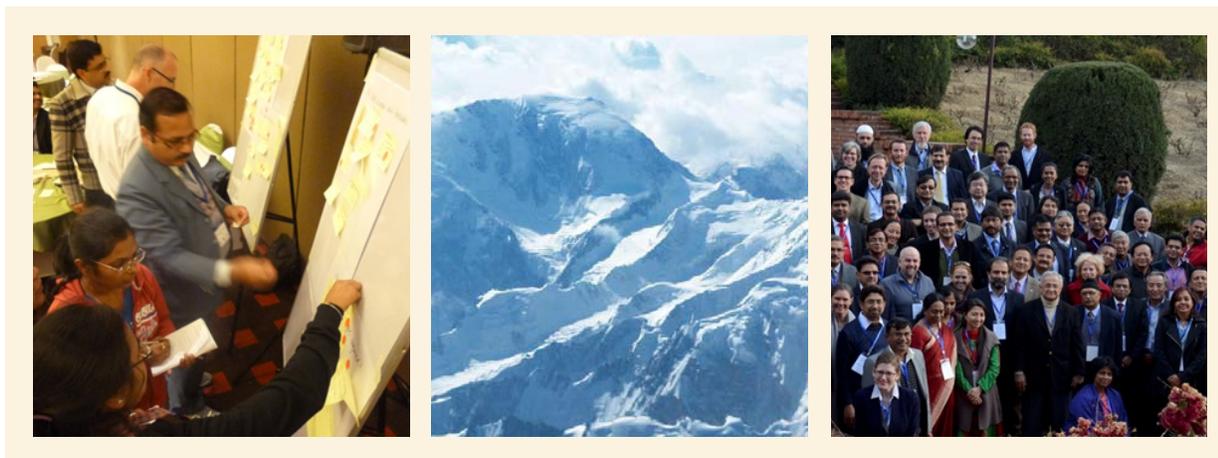
Scoping Interventions and Investments



The Sundarbans Focus Area strategy does not target scoping of interventions and investments in FY15. In FY16, work will commence on the design of an integrated and joint landscape scale hydro-met monitoring network. As well as supporting improved understanding, the cooperation required to design, establish and operate a joint network is expected to strengthen institutional arrangements for joint management of the Sundarbans.



Regional Cross-Cutting Focus Area



Each of SAWI's four geographic Focus Areas is unique, but there are common challenges and opportunities that cut across them. The Regional Cross-Cutting Focus Area fosters cross-fertilization and sharing of experience and knowledge, and both complements and supplements the activities under the basin/landscape Focus Areas.

In FY15, significant progress was made on Regional Cross-Cutting Focus Area activities that contribute to SAWI's overall objective – to increase cooperation in the management and development of the major Himalaya river systems in South Asia through enhanced dialogue, improved knowledge, and strengthened capacity. This included activities that supported: (i) trust and confidence building via Track II processes; (ii) knowledge generation and sharing on issues of regional relevance – climate change and disaster risk management; and (iii) capacity building in water diplomacy, water quality services, and climate risk management. Several activities also contributed to ongoing work in the basin/landscape Focus Areas to scope investments in cooperative transboundary water management and development.

Building Trust and Confidence

An important mechanism for building trust and confidence across the region is dialogue, which is most effective if centered on a particular topic or theme that is of wide interest and avoids potential political tensions. In FY15, the first major regional dialogue event supported by SAWI since December 2012 was held in Nepal (February, 2015) around the neutral and unifying theme of the water-energy-food nexus. The flagship "Water-Energy-Food Nexus Forum" was convened in partnership with the Fulbright Commission, the International Centre for Integrated Mountain Development (ICIMOD), and the Nepal Water Conservation Foundation. It brought together over 100 participants, including representatives from government and NGOs, national and international experts, and recognized specialists on nexus thinking and analysis. The event focused on the transboundary dimensions of managing the water-energy-food nexus complemented by reflections on success factors in past and current Track II processes relating to water in South Asia. Two reports from the forum (proceedings and a Track II dialogue mapping report) were published and plans are underway to build on this successful event to further broaden and enrich the dialogue on transboundary waters.



Generating and Sharing Knowledge

In FY15, several activities that contribute to generating and sharing regionally-relevant knowledge were advanced, with a focus on strengthening resilience to climate change and disaster risk management. Various methods for screening climate change and disaster risks and for integrating resilience measures into basin water investment planning were compiled and evaluated. The most promising methods were trialed at the project level (for the Upper Arun Hydropower Project) and at basin level (for the Kosi River Basin) in Nepal to provide proof of concept and to establish the feasibility of broader future application. The contribution of snow and glacier melt to streamflow, including the potential effects of climate change, was also analyzed for the Kosi River Basin in Nepal. This study included a compilation of the current state of knowledge and relevant data, mapping and hypsometries for glaciated areas, and analysis of glacier-origin flows and the potential climate change impacts.

Two activities to improve disaster risk management neared completion in FY15. The first developed an innovative approach using remote sensing technologies for flood forecasting to overcome significant data limitations in the region. This approach will be trialed in an operational mode in a transboundary sub-basin of the Ganges. The second activity focused on assessing and mapping flood risks at the basin scale, using the greater Ganges Basin as a test case. These activities link closely to the National Hydrology Project in India (under preparation) with a view to exploit opportunities for scaling up.

Building Institutional Capacity

While most activities under the Regional Cross-Cutting Focus Area have a capacity building dimension, three activities in FY15 explicitly target critical capacity development needs in key areas: (i) water diplomacy and transboundary water governance, (ii) water quality services, and (iii) climate risk management. These three areas are discussed below.



Visit to Bali village. Photo: WWF

International and regional experience has shown that varying degrees of capacity can affect country engagement in complex negotiations around transboundary waters. With the aim of “leveling the playing field” for more effective and balanced negotiations, capacity building in water diplomacy and transboundary water governance commenced in FY15. The focus was on: (i) preparatory activities to design short training modules and curriculum for universities and other institutions in the region, (ii) design of a two-year capacity building program for the Bangladesh Joint Rivers Commission and other Bangladesh government officials, and (iii)

technical assistance to the Indian Foreign Services Institute for the development of hydro-diplomacy modules to train diplomats.

In FY15, work progressed on increasing the use of modern technologies and techniques for water quality monitoring, analysis, use and dissemination, which is a recognized need in a region confronting widespread challenges of surface water pollution. This included two days of hands-on training for staff

of the National Mission Clean Ganga in India (November 2014), focusing on data visualization tools to strengthen data analysis capability with the use of high-tech, low-cost open source knowledge products. A report on analysis of real-time water quality monitoring was presented to the Indian Central Pollution Control Board and the National Mission Clean Ganga, which will now be disseminated widely across the region.

Progress was made in enhancing the management of shared climate risks by evaluating international best practices in transboundary risk management and their relevance to South Asia. This work assessed existing protocols, institutional arrangements and modalities for hydro-meteorological risk management and data sharing between South Asia countries, and identified data and information gaps and needs.

Scoping Interventions and Investments

While most work on scoping of interventions and investments falls under the basin/landscape Focus Areas, activities under the Regional Cross-Cutting Focus Area support these efforts. Specifically, in FY15, work provided the knowledge-base to inform investment planning, tackled shared regional challenges (climate change, disaster risk management, and water quality services); strengthened the institutional foundation for improved planning and management of shared water resources; and broadened the dialogue on cooperation in transboundary waters to include issues of common interest to a wider range of stakeholders.



Regional Workshop. Photo: The World Bank



3. Appendices

Appendix I – Summary of Activities by Focus Area

Indus Basin Focus Area

Pillar 1: Long-term Basin Development and Investment Planning

SAWI is providing support in Afghanistan and Pakistan to projects that help strengthen water resources management capacity. SAWI informed the preparation of additional financing for two projects that will enhance capacity for shared river basin management and transboundary water governance in Afghanistan and Pakistan, respectively. Project implementation support in Pakistan identified a new SAWI activity on groundwater management in the Punjab that will commence in FY16.

Pillar 2: Investments and Capacity Building for Water and Energy Security

Integrated Management of the Kunar River Basin: SAWI is supporting World Bank engagement in sustainable, cooperative management and development of water resources within the Kunar River Basin. In FY15, SAWI supported technical and analytical work on joint Kunar River Basin management and helped identify investment opportunities for water and energy security. The following reports were shared with key stakeholders for comment prior to finalization: (i) a synthesis of the opportunities and challenges of developing HEP in the KRB, (ii) a study on institutional design options for transboundary management, (iii) a water balance and climate change analysis, evaluating the water balance impacts and power production potential of future HEP development in the KRB under a range of operational scenarios, (iv) a remote sensing assessment and terrain analysis for the KRB and (v) a review of prior technical assessments and feasibility studies. Overall, the activity contributed to the momentum in both Afghanistan and Pakistan toward joint development of the Kunar River Basin.

Pillar 3: Basin-Level Dialogue

Indus Basin Dialogue: Since 2013 SAWI has supported a four-country dialogue for Indus riparian countries. The Third Indus Forum (Lahore; March 2015) addressed “Climate Change and Vulnerability of Indus Water Resources”. Senior government and non-government participants from the four riparian countries participated and established a working group, with at least two participants from each country to develop a joint research proposal on basin-level adaptation and climate resilience models. The working group, following virtual discussions and a scientific visit to China, is finalizing a proposal for presentation to international, national and bilateral donors.

Ganges Basin Focus Area

Pillar 1: Valuing the Environment and Ecosystem Services

Ganges Strategic Basin Planning: SAWI is providing technical assistance to the Government of India and relevant state governments for strategic water resources planning of the Ganges Basin. The work will consider surface-groundwater interactions, environmental flows and water quality, using best practice modelling and structured consultation with key stakeholders. A procurement process in FY15 led to a US\$3.5 million contract being awarded to Deltares (Netherlands).

In February 2015, in New Delhi, a workshop was convened to discuss environmental flows for the Ganges River. The workshop shared international experience on environmental flows in the context of IWRM and discussed how to approach this challenge in the Ganges Basin. Over 100 participants from central and state governments, NGOs and academia participated, and reached broad consensus on a



staged approach to scoping environmental flow options. A workshop report was produced that includes a roadmap for future action.

Sustainable Water Resources for HEP in Nepal: In October 2014, in Kathmandu, a river basin planning workshop was convened to raise understanding and generate buy-in among key governmental and non-governmental actors on the value of integrated river basin planning. River basin planning is critical to enable a strategic approach to HEP planning and development in Nepal. Hosted jointly with the Government of Nepal, the workshop laid the foundations for the substantive technical work that SAWI will support on river basin planning for HEP development. Key workshop conclusions were: (i) there is a clear rationale for Nepal to pursue integrated basin planning in the context of sustainable energy sector development, (ii) the Government of Nepal needs to strengthen planning capacity, sectoral coordination and ownership, and (iii) coordination among donors needs to be improved to effectively support capacity building for government. The workshop reached consensus on: (i) the need for integrated river basin planning (including consideration of environment values), (ii) terms of reference for consulting services for the IWRM for selected river basins in Nepal and (iii) an agreement to establish a cross-agency committee to coordinate government efforts in environment protection, hydropower development, irrigation development and water supply.

Pillar 2: Moving from Data to Information Services

Water Resources Management in Transboundary Basins: SAWI is supporting preparation of the National Hydrology Project (NHP) in India that will strengthen water resources monitoring, planning and management, especially in the Ganges River Basin (GRB) and Brahmaputra River Basin (BRB). NHP builds on earlier projects in peninsular India to now address the Ganges and Brahmaputra basins and to move from hydro-met data collection to cooperative river basin planning and flood management. SAWI has provided access to international best practice in basin modelling, basin planning and flood management, has highlighted the importance of the river basin approach, and is show-casing examples of successful river basin organizations in diverse settings. Additionally, SAWI provided training in real-time hydro-met for more than 60 professionals; a hydro-met manual was produced.

In February 2015, in New Delhi, a National IWRM Workshop was convened for 100 relevant central and state government officials and other stakeholders. The workshop showcased international experiences in IWRM and river basin organizations including key transboundary examples, discussed and provided guidance on finalizing the National IWRM Guidelines and considered potential IWRM investments. The workshop called for broad stakeholder consultation to inform a participatory approach to IWRM, noted the importance of legislative reform to enable the establishment of effective river basin organizations and noted the benefits for IWRM of formalizing water access rights.

Pillar 3: Basin-Level Dialogue

Ganges Basin Dialogue: SAWI is facilitating technical interactions amongst institutions around the world involved in water resources modelling of the GRB. A Community of Practice (CoP) has been established with interactions to-date limited to virtual interactions and email dialogue. A survey of CoP members was conducted on the preferred scope and modality for the CoP, a compilation of literature relating to hydrologic and water resources modelling in the GRB was undertaken and a baseline audit of recent/current/planned modelling work for the GRB was completed. It is expected that in FY16 the CoP will be linked to the strategic basin planning work in both India and Nepal to provide a forum for technical engagement with government and non-government stakeholders.

Brahmaputra Basin Focus Area

Pillar 1: Knowledge and Capacity Building for Basin Management and Investment Planning

Yellow River IWRM Study Tour: In July 2015, a study tour to the Yellow River in China provided an opportunity for water managers from India, Bangladesh, Bhutan and Myanmar to learn from international experience on basin-level IWRM. Similar to the BRB, the Yellow River is characterized by high sediment loads and frequent floods. The tour visited the Yellow River Water Resources Commission and the Xiaolangdi Multi-purpose Dam and meetings were held with officials from the Ministry of Water Resources in Beijing. Discussion among participants identified areas for BRB collaboration and activity.

Participants recommended formation of a “Brahmaputra Forum” in each riparian country, with representatives coming together to form a basin-level forum to address regional problems that require joint or coordinated responses by two or more riparians. A request from China for a reciprocal visit led to a delegation from Anhui Province, China, visiting New Delhi in November 2014.

Hydro-met Modernization in the Brahmaputra Basin: Technical analysis of existing hydro-met networks for monitoring, forecasting and early warning, has scoped the required hydro-met modernization for the Brahmaputra. A consulting firm has been hired to conduct an economic analysis of hydro-met modernization in Bangladesh, informed by a stakeholder consultation workshop in Dhaka (March 2015), to assess user needs. This workshop and other consultations have helped raise awareness of the importance of hydro-met modernization in Bhutan and Bangladesh.

Pillar 2: Reducing Vulnerability to Floods and Erosion

River Management Improvement in Bangladesh: SAWI preparation support for the River Management Improvement Project (Bangladesh) funded economic assessments, modelling studies and embankment scour analyzes to inform the design of the project. Support also included cumulative impact assessments, plans for embankment asset management systems and a technical note on cost-effective technologies. Experts reviewed delta challenges, and key stakeholders were consulted to inform an integrated river basin plan to manage challenges in the built environment.

Flood and Erosion Management in Northeast India: SAWI support for the proposed Erosion Management Project in Assam, India, emphasized the importance of knowledge generation and stakeholder engagement to identify challenges and opportunities for basin investments and to contribute to longer-term water resource management. This occurred through participation in the 2014 Assam Water Conference, and through convening a consultative conference (January 2015) with key stakeholders and local project beneficiaries. As no formal request for the project has been forthcoming from the Government of India, SAWI will use other mechanisms in FY16 to engage with central and state governments in India (notably NHP) on BRB modelling and analysis to inform a river basin approach to planning and management.

Pillar 3: Basin-level Dialogue

Brahmaputra Basin Dialogue: SAWI is supporting discussions on BRB management through multiple mechanisms. In collaboration with the Assam Water Resources Management Institute and the Indian Institute of Management (IIT)-Guwahati, a two-day “Classroom Conference to River Confluence” event was organized in Assam, India (January 2015). The event included field visits to consult local communities. Attended by academics, central and state government officials, the meeting identified BRB knowledge, institutional and capacity gaps, and provided a roadmap to guide future SAWI engagement in the basin. The meeting stressed the importance of long-term planning for socially-responsible and environmentally-sustainable water resources development and management in the basin, and proposed a Water Resources Centre of Excellence in Assam to maintain a comprehensive basin database, study and monitor river behavior, address human resources and capacity building needs of the stakeholder departments, and work on long-term river development plans.



A study tour to the Mississippi River (June 2015) for 15 senior officials from Bangladesh, India and Bhutan showcased international experience in flood management and river navigation and provided an opportunity for multi-country basin dialogue on BRB management issues. The tour visited the Mississippi River Commission, the US Army Corps of Engineers (including the Engineer Research and Development Center and the New Orleans District) and levee boards along the lower river.

Sundarbans Landscape Focus Area

Pillar 1: Enhancing Bilateral Cooperation

Joint Landscape Planning: A draft narrative that combines existing single-country narratives to provide an integrated view of the Sundarbans Landscape to guide joint planning has been prepared. This will enable stakeholders to better understand common challenges and opportunities for management of the Sundarbans, rather than focusing on political-administrative differences between the two countries. This study will be completed and disseminated in FY16.

Sundarbans Dialogue: SAWI supported multiple events to build trust and strengthen working relationships between India and Bangladesh for sustainable management of Sundarbans encompassing both country-specific needs and landscape-level priorities. An international workshop on “Risk Management and Adaptation to Climate Change for Sustainable Growth in the Deltaic Region” was held in Kolkata, India (January 2015), in collaboration with the Disaster Management Department, Government of West Bengal, India, WWF (World Wildlife Fund) and EnGIO (Environment Governed Integrated Organization). The workshop provided over 100 policy makers and experts with an overview of the disaster risks and climate change induced risks to the Sundarbans, and shared experiences from other deltas in mitigating natural disasters and sea level rise impacts and in achieving sustainable development and resilience. Key workshop recommendations include: (i) mainstream climate change ecosystem based disaster risk reduction approaches into policies and development planning, (ii) enhance scientific and technical work on disaster risk reduction, (iii) ensure the use of traditional, indigenous and local practices to complement scientific knowledge in disaster risk assessment and (iv) encourage parliamentarians to support disaster risk reduction by developing new or amending relevant legislation.

A transboundary media workshop (aboard the *MV Paramhansa*) was organized for 28 media personnel representing prominent print and electronic media houses in Bangladesh and India (March 2015). The workshop: (i) discussed and prepared a first draft of a media collaboration plan, (ii) planned ways to sustain media coverage on joint management of the Sundarbans, and (iii) began development of a transboundary Sundarbans media strategy. Field visits exposed participants to fishing communities, forest camps; village-level climate change impacts; integrated livelihood management and ecotourism; and ecosystem dynamics and ecosystem services. An introductory meeting with political delegates from India and Bangladesh was held. Workshop recommendations address: (i) communication and knowledge management issues, (ii) policy and technical issues, and (iii) environmental and social issues. Smaller subsequent media discussions are helping to advance the agreed actions.

SAWI facilitated discussion with the Government of Bangladesh on the scope of “Delta Plan 2100” (under which the Sundarbans Landscape is important for achieving higher and more resilient economic growth in Bangladesh) and on World Bank engagement in water resources management and development. SAWI organized informal meetings on water resources management in the West Bengal Sundarbans, and facilitated a workshop for ministers, other members of parliament and civil society groups from Bangladesh and West Bengal (March 2015). The workshop considered how bilateral management mechanisms could best be established.

Pillar 2: Technical Cooperation to Support Joint Management

Targeted Environmental Studies: SAWI is supporting targeted environmental studies that help build confidence and momentum for a Sundarbans “Joint Platform” for guiding long-term planning and collaborative work. Initial work has included studies on livelihood implications of climate change in the Sundarbans and studies on flora and fauna at risk in a changing climate. These will be completed in early FY16. In FY15, SAWI also provided analytical inputs on the Sundarbans to NHP (India) and to the proposed Bangladesh hydro-met project.

Regional Cross-Cutting Focus Area

Pillar 1: Knowledge Related Activities

Climate Change Impacts on HEP: Various scientific methods for screening climate change and disaster risks, and for integrating appropriate resilience measures in water, hydropower and dam investments in the South Asia region were assessed during FY15. A decision tree analysis method for climate change risk was trialed for the proposed Upper Arun Hydropower Project and for the entire Kosi River Basin considering multiple potential development. This trial demonstrated how the approach could support national level energy sector planning in Nepal. A synthesis report and a full report were prepared and shared with stakeholders via videoconference (March 2015).

Snow/Glacier Contributions to Streamflow and Climate Change Impacts: In FY15, SAWI developed and applied a method to estimate the contribution of snow and glaciers to river flow in selected basins/sub-basins across the Himalayas, and to assess how these contributions will be affected by climate change. Reports on the analysis for the Kosi River Basin, presented in the context of the existing cryosphere hydrology knowledge for the Kosi River Basin, have been completed.

Transboundary Risk Management and Data Sharing: SAWI is supporting of analytical work to improve regional dialogue and collaboration in South Asia with respect to transboundary risk management and hydro-meteorological data sharing. In FY15, a consulting firm was hired to carry out an analysis to better understand international best practices with respect to transboundary management; existing protocols, institutional arrangements and modalities for hydro-meteorological risk management and data sharing between the South Asia countries; and existing data gaps and types of data sharing that could improve cross border risk management. An inception report has been prepared, and an extensive process of selecting three transboundary river basins for detailed analysis was completed. Regional consultations and a study tour to one of the analyzed basins (with participants from Bangladesh, Bhutan, India, and Nepal) are planned as part of follow up to the activity.

Improving Watershed Management: SAWI is strengthening coordination between the Neeranchal National Watershed Project (NNWP) (India) and other regional programs addressing basin level water resources, watershed management and climate resilience. Activities planned for FY15 were, however, delayed pending cabinet clearance for NNWP.

Pillar 2: Capacity Building Activities

Capacity Building – Transboundary Water Governance: SAWI is building capacity in transboundary water governance and hydro-diplomacy for current and future water leaders across the seven SAWI countries. Courses on transboundary water governance are not regularly taught at South Asian universities and training seminars for government officials occur on an ad hoc basis and usually delivered by experts from outside the region. Preparatory work in FY15 supported the design of short training modules and curriculum in water diplomacy and basin governance for use by participating universities in South Asia. In February 2015, SAWI received a request from the Ministry of Water Resources, Bangladesh, for transboundary water governance training for officials from the Joint Rivers Commission, Bangladesh, as well as government officials. In response, SAWI designed a two-year capacity building program;



implementation commenced in June 2015. SAWI also helped the India Foreign Service Institute take its first steps into hydro-diplomacy teaching, and provided support for one Government of Bhutan official to participate in external hydro-diplomacy training.

Capacity Building – Water Quality Monitoring and Analysis: SAWI is raising awareness and increasing the use of modern technologies in water quality monitoring, and the techniques for water quality analysis, use and dissemination. In FY15, two days of hands-on training was provided for Government of India officers on data visualization using low-cost, high-tech, open source tools. The report on analysis of real-time water quality monitoring, presented to the Central Pollution Control Board (India) and the National Mission Clean Ganga will be disseminated via the SAWI website. Further training and regional distribution of training materials is planned.

Pillar 3: Regional Flood Forecasting

Improving Flood Forecasting in South Asia: SAWI is providing technical assistance to improve basin-scale flood forecasting in the GRB and BRB. In FY15, a basin-scale flood risk assessment for the GRB was prepared and a study on development of flood forecasting for the GRB and BRB commenced using satellite based precipitation, ensemble weather forecasts, and remotely sensed river widths and height. In FY16, this work will be completed and disseminated with a view to operationalizing in Bihar with SAWI support and up-scaling more broadly in India via NHP.

Pillar 4: Dialogue Processes

Regional Dialogue: To advance regional Track II dialogue on water cooperation, SAWI supported the Fulbright Water-Energy-Food Nexus Dialogue Forum, in Kathmandu (February 2015). The event was a partnership between SAWI, the Fulbright Commission (with many regionally-based alumni attending), ICIMOD, and the Nepal Water Conservation Foundation. The Forum focused on the transboundary dimensions of managing the water-energy-food nexus, especially via a river basin approach. The event was designed to broaden regional dialogue beyond water resources, to include the agriculture and energy sectors, and thus assembled over 100 participants; numbers were eventually limited by logistic constraints and the desire to not compromise the dialogue character of the event. The Forum also reflected on past and current Track II processes relating to water in South Asia and identified key success factors. The reports from the workshop (forum proceedings and a Track II dialogue mapping report) will be shared via the SAWI website. The Forum generated energy and enthusiasm, and a call for an ongoing series of such regional events on water-relevant topics.

Appendix 2 – SAWI Results Framework and FY15 Performance

SAWI is providing support in Afghanistan and Pakistan to projects that help strengthen water resources management capacity. SAWI informed the preparation of additional financing for two projects that will enhance capacity for shared river basin management and transboundary water governance in Afghanistan and Pakistan, respectively. Project implementation support in Pakistan identified a new SAWI activity on groundwater management in the Punjab that will commence in FY16. The SAWI results framework describes both intermediate results and the outcomes being sought from the program, and provides indicators for these as well as annual target values for each indicator by Focus Area. In addition, “results chains” are provided that link the portfolio of activities through their expected outputs to the results and outcomes being sought. Finally, definitions of key terms are provided to help interpret the monitoring framework. A summary table of FY15 performance (i.e., the numerator) against agreed target values (i.e., the denominator) is provided below.

Relative to the agreed targets, progress for FY15 was highly satisfactory. Intermediate results met all program-level targets and significantly exceeded the target for indicator 3.1 (Number of professionals trained). For FY16, the forward targets for this indicator will be revised to better reflect the diverse nature of training being delivered, that includes important one-off awareness raising and “exposure” events.

Performance Targets and Achievements for FY15

Results Indicators	I	G	B	S	X	Total
1.1 Number of regional and basin/landscapes dialogue processes facilitated or supported by SAWI	1/1	1/1	1/1	1/1	1/1	5/5
2.1 Number of regional, basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making	1/1	1/1	2/0	1/0	0/0	5/2
3.1 Number of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation	6/5	260/10	60/5	130/5	10/15	466/40
3.2 Number of key water management organizations with policy or technical capacity significantly strengthened by SAWI activities in areas relevant to basin scale planning or regional cooperation	0/0	6/1	0/0	2/0	1/1	8/2
4.1 Number of regional, basin/landscape or sub-basin-level knowledge products produced and shared with key stakeholders, including decision makers	0/1	2/2	1/2	3/1	2/2	8/8
5.1 Number of regional, basin or sub-basin-level feasibility studies or intervention designs informed by SAWI activities	2/0	0/0	1/2	0/0	0/0	3/2

FA Legend: **I**: Indus; **G**: Ganges; **B**: Brahmaputra; **S**: Sundarbans; **X**: Regional Cross-cutting

While the program’s macro-scale water management perspective may be seen as far removed from the immediate concerns of women and disadvantaged groups, efforts are made in program implementation to ensure that concerns and opportunities relating to gender and inclusiveness are addressed. This especially includes consideration in the thematic and participation design of dialogue processes, workshops and trainings. For the Classroom Conference to River Confluence (Brahmaputra FA), consultations were conducted with riverine communities to understand their concerns and needs and to seek their planning recommendations. The workshop on Risk Management and Adaptation to Climate Change for Sustainable Growth in Deltaic Regions (Sundarbans FA) discussed integration of gender aspects in holistic multi-disciplinary analyses to catalyze positive change for development. The transboundary media workshop (Sundarbans FA) discussed the need to emphasize news coverage on migration, especially of women and girls as an impact of climate change. Gender balance on expert panels, team lead roles for women delegates during group discussions, and active participation of women during interactive sessions were all part of deliberate conference design of the Water-Energy-Food Nexus Workshop (Regional FA). Participation of women delegates in dialogue processes was at a ratio of 34/146 and among the 466 professionals trained, 35 were women.

Outcome and Result Indicators

Program Development Objective	Outcome Indicators for PDO
To increase regional cooperation in the management of the Himalayan River systems to deliver sustainable, fair and inclusive development and climate resilience	<p>A1. Governance: <i>Number</i> of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by SAWI activities.</p> <p>B1. Investments: <i>Value</i> of investments secured through bilateral or multilateral governance processes that have been informed by SAWI activities.</p> <p>B2. Investments: <i>Quality</i> of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed.</p>
Intermediate Results	Results Indicators
1. Trust and confidence in regional or basin water management increased by dialogue processes	1.1 <i>Number</i> of regional and basin/landscape dialogues facilitated or supported by SAWI.
2. Stakeholder input to government decision making strengthened by participatory processes that facilitate transboundary knowledge generation and sharing	2.1 <i>Number</i> of regional, basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making.
3. Capacity of water resources organizations strengthened in areas relevant to transboundary cooperation	<p>3.1 <i>Number</i> of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation.</p> <p>3.2 <i>Number</i> of water management organizations with policy or technical capacity significantly strengthened by SAWI activities in areas relevant to basin-scale planning or regional cooperation.</p>
4. Regional, basin or sub-basin-level knowledge increased and accessible to stakeholders including decision makers	4.1 <i>Number</i> of regional, basin/landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers.
5. Regional, basin or sub-basin-level interventions designed to improve livelihoods and ecosystem sustainability	5.1 <i>Number</i> of regional, basin or sub-basin-level feasibility studies or intervention designs informed by SAWI activities.

Program and Focus Area Indicator Targets

Program Level Target Values

Outcome Indicators	Target Values					Data Collection and Reporting
	FY14	FY15	FY16	FY17	FY18	
A1. Number of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by SAWI activities.	0	0	1	3	1	SAWI Program Leader
B1. Investments: Value (US\$B) of investments secured through bilateral or multilateral governance processes that have been informed by SAWI activities.	0	0.1	0.2	0.2	0.5	SAWI Program Leader
B2. Investments: Quality of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed.	Low	Low	Med	Med	High	SAWI Program Leader
Results Indicators						
1.1 Number of regional and basin/landscape dialogues facilitated or supported by SAWI.	3	5	5	5	5	Focus Area Leader
2.1 Number of regional, basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making.	1	2	2	2	1	Focus Area Leader
3.1 Number of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation.	20	40	50	50	20	Focus Area Leader
3.2 Number of key water management organizations with policy or technical capacity significantly strengthened by SAWI activities in areas relevant to basin scale planning or regional cooperation.	0	2	2	4	2	Focus Area Leader
4.1 Number of regional, basin/landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers.	3	8	8	8	10	Focus Area Leader
5.1 Number of regional, basin or sub-basin-level feasibility studies or intervention designs informed by SAWI activities.	0	2	4	4	4	Focus Area Leader

Indus Focus Area Target Values

Outcome Indicators	Target Values				
	FY14	FY15	FY16	FY17	FY18
A1. <i>Number</i> of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by SAWI activities.	0	0	0	1	0
B1. Investments: <i>Value</i> (US\$B) of investments secured through bilateral or multilateral governance processes that have been informed by SAWI activities.	0	0	0	0	0.3
B2. Investments: <i>Quality</i> of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed.	Low	Low	Low	Low	High
Results Indicators					
1.1 <i>Number</i> of regional and basin/landscape dialogues facilitated or supported by SAWI.	2	1	1	1	1
2.1 <i>Number</i> of regional, basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making.	0	1	0	0	0
3.1 <i>Number</i> of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation.	0	5	5	5	0
3.2 <i>Number</i> of key water management organizations with policy or technical capacity significantly strengthened by SAWI activities in areas relevant to basin scale planning or regional cooperation.	0	0	1	1	0
4.1 <i>Number</i> of regional, basin/landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers.	1	1	1	1	1
5.1 <i>Number</i> of regional, basin or sub-basin-level feasibility studies or intervention designs informed by SAWI activities.	0	0	1	0	1

Ganges Focus Area Target Values

Outcome Indicators	Target Values				
	FY14	FY15	FY16	FY17	FY18
A1. Number of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by SAWI activities.	0	0	0	1	0
B1. Investments: Value (US\$B) of investments secured through bilateral or multilateral governance processes that have been informed by SAWI activities.	0	0	0	0.2	0
B2. Investments: Quality of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed.	Low	Low	Low	Med	Med
Results Indicators					
1.1 Number of regional and basin/landscape dialogues facilitated or supported by SAWI.	0	1	1	1	1
2.1 Number of regional, basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making.	0	1	0	1	0
3.1 Number of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation.	0	10	10	10	0
3.2 Number of key water management organizations with policy or technical capacity significantly strengthened by SAWI activities in areas relevant to basin scale planning or regional cooperation.	0	1	0	2	0
4.1 Number of regional, basin/landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers.	0	2	2	2	2
5.1 Number of regional, basin or sub-basin-level feasibility studies or intervention designs informed by SAWI activities.	0	0	1	0	1

Brahmaputra Focus Area Target Values

Outcome Indicators	Target Values				
	FY14	FY15	FY16	FY17	FY18
A1. <i>Number</i> of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by SAWI activities.	0	0	0	1	0
B1. Investments: <i>Value</i> (US\$B) of investments secured through bilateral or multilateral governance processes that have been informed by SAWI activities.	0	0.1	0	0	0.2
B2. Investments: <i>Quality</i> of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed.	Low	Low	Low	Low	Med
Results Indicators					
1.1 <i>Number</i> of regional and basin/landscape dialogues facilitated or supported by SAWI.	0	1	1	1	1
2.1 <i>Number</i> of regional, basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making.	1	0	1	0	1
3.1 <i>Number</i> of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation.	8	5	5	5	0
3.2 <i>Number</i> of key water management organizations with policy or technical capacity significantly strengthened by SAWI activities in areas relevant to basin scale planning or regional cooperation.	0	0	0	1	1
4.1 <i>Number</i> of regional, basin/landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers.	1	2	1	2	1
5.1 <i>Number</i> of regional, basin or sub-basin-level feasibility studies or intervention designs informed by SAWI activities.	0	2	0	2	1

Sundarbans Focus Area Target Values

Outcome Indicators	Target Values				
	FY14	FY15	FY16	FY17	FY18
A1. Number of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by SAWI activities.	0	0	1	0	0
B1. Investments: Value (US\$B) of investments secured through bilateral or multilateral governance processes that have been informed by SAWI activities.	0	0	0.2	0	0
B2. Investments: Quality of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed.	Low	Low	Med	Med	Med
Results Indicators					
1.1 Number of regional and basin/landscape dialogues facilitated or supported by SAWI.	1	1	1	1	1
2.1 Number of regional, basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making.	0	0	1	1	0
3.1 Number of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation.	0	5	5	5	0
3.2 Number of key water management organizations with policy or technical capacity significantly strengthened by SAWI activities in areas relevant to basin scale planning or regional cooperation.	0	0	1	0	1
4.1 Number of regional, basin/landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers.	0	1	2	1	2
5.1 Number of regional, basin or sub-basin-level feasibility studies or intervention designs informed by SAWI activities.	0	0	2	2	2

Regional Cross-cutting Focus Area Target Values

Outcome Indicators	Target Values				
	FY14	FY15	FY16	FY17	FY18
A1. Number of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by SAWI activities.	0	0	0	0	0
B1. Investments: Value (US\$B) of investments secured through bilateral or multilateral governance processes that have been informed by SAWI activities.	0	0	0	0	0
B2. Investments: Quality of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed.	NA	NA	NA	NA	NA
Results Indicators					
1.1 Number of regional and basin/landscape dialogues facilitated or supported by SAWI.	0	1	1	1	1
2.1 Number of regional, basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making.	0	0	0	0	0
3.1 Number of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation.	12	15	25	25	20
3.2 Number of key water management organizations with policy or technical capacity significantly strengthened by SAWI activities in areas relevant to basin scale planning or regional cooperation.	0	1	0	0	0
4.1 Number of regional, basin/landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers.	1	2	2	2	4
5.1 Number of regional, basin or sub-basin-level feasibility studies or intervention designs informed by SAWI activities.	0	0	0	0	0

Focus Area Results Chains

Indus Focus Area

Activities	Output	Results	Results Indicators	Outcome	Outcome Indicators
<p>Pillar 1: Knowledge and capacity for long-term basin development and investment planning</p> <ul style="list-style-type: none"> • Groundwater Management in the Punjab 	<ul style="list-style-type: none"> • Training and awareness raising events • Models and modelling reports including options assessment 	<ul style="list-style-type: none"> • Knowledge and capacity among riparian countries increased 	<p>3.1 <i>Number of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation</i></p> <p>4.1 <i>Number of regional, basin/ landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers</i></p>	<ul style="list-style-type: none"> • New investments planned via cooperative and consultative processes and informed by robust analysis including of climate change impacts • Improved coordination and cooperation among responsible agencies, stakeholders on water management (including between countries) 	<p>B1. <i>Value of investments secured through bilateral or multilateral governance processes that have been informed by Indus FA activities</i></p> <p>B2. <i>Quality of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed</i></p>
<p>Pillar 2: Facilitating investments in Indus Basin management and development</p> <ul style="list-style-type: none"> • Strategic Analysis of HEP Potential of the Kunar Basin • Institutional Options for HEP in the Kunar Basin 	<ul style="list-style-type: none"> • Knowledge products on Kunar/Kabul Basins assessing HEP potential • Workshops/ training: 2-3 joint; 2-4 per country • High-level meeting facilitated • Reports (not public) on institutional options for HEP development 	<ul style="list-style-type: none"> • Regional and basin-level interventions designed to improve basin water management 	<p>1.1 <i>Number of regional and basin/ landscape dialogue meetings facilitated by Indus FA</i></p> <p>5.1 <i>Number of regional, basin or sub-basin-level feasibility studies or intervention designs informed by Indus FA activities</i></p>	<ul style="list-style-type: none"> • A1. <i>Number of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by Indus FA activities</i> 	<p>A1. <i>Number of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by Indus FA activities</i></p>

Indus Focus Area (continuation)

Activities	Output	Results	Results Indicators	Outcome	Outcome Indicators
<p>Pillar 3: Basin Dialogue</p> <ul style="list-style-type: none"> • Indus Dialogue – Indus Basin Forum • Learning Innovative Approaches to Glacier Monitoring to Address Climate Change Challenges 	<ul style="list-style-type: none"> • Indus Forum established and meeting regularly • Complementarity with other dialogue processes identified • Messages/ statements of Track II dialogue processes align in favor of promoting coordinated water resources management • Study on climate change impacts on cryosphere / hydrosphere finalized and disseminated 	<ul style="list-style-type: none"> • Increased dialogue processes among Indus Forum members and stakeholders to improve understanding of benefits of coordinated management and communication cross-border 			

Ganges Focus Area

Activities	Output	Results	Results Indicators	Outcome	Outcome Indicators
<p>Pillar 1: Valuing the Environment and Ecosystem Services</p> <ul style="list-style-type: none"> • Strategic basin planning for the Ganges in India • Sustainable water resources management for HEP development in Nepal • Managing watersheds to reduce sediment in hydropower in Nepal 	<ul style="list-style-type: none"> • Basin and sub-basin water resources models • Basin and sub-basin databases and GIS portal • Reports of analytical work including scenario assessments, documentation of software and models, reports on basin consultation and stakeholder engagement processes 	<ul style="list-style-type: none"> • Knowledge and capacity environmental water uses among officials, researchers and NGOs in all riparian countries increased 	<p>2.1 <i>Number of regional, basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making</i></p> <p>3.1 <i>Number of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation.</i></p> <p>4.1 <i>Number of regional, basin/landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers.</i></p> <p>5.1 <i>Number of regional, basin or sub-basin-level feasibility studies or intervention designs informed by Ganges FA activities.</i></p>	<ul style="list-style-type: none"> • New investments planned via cooperative and consultative processes and informed by robust analysis including of the environment dimensions of water management 	<p>B1. <i>Value of investments secured through bilateral or multilateral governance processes that have been informed by Ganges FA activities</i></p> <p>B2. <i>Quality of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed</i></p> <p>A1. <i>Number of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by Ganges FA activities</i></p>
<p>Pillar 2: Moving from Data to Information Services</p> <ul style="list-style-type: none"> • Support in India for water resources management in transboundary river basins • Flood forecasting in the Baghmata sub-basin 	<ul style="list-style-type: none"> • Trainings, study tours, seminars undertaken • Operational pilot flood forecasting system 	<ul style="list-style-type: none"> • Improved sharing of data and information for basin water management, flood forecasting and early warning 			
<p>Pillar 3: Dialogue, Communications, Knowledge Management and Business Development</p> <ul style="list-style-type: none"> • Ganges basin dialogue 	<ul style="list-style-type: none"> • Ganges basin modelling Community of Practice • Activities and outputs of the Ganga Focus Area actively disseminated to the public 	<ul style="list-style-type: none"> • Ganga basin modelling CoP actively engaged 	<p>1.1 <i>Number of regional and basin/landscape dialogue meetings facilitated by Ganges FA</i></p>	<ul style="list-style-type: none"> • Improved coordination amongst responsible agencies and stakeholders including between countries 	

Brahmaputra Focus Area

Activities	Output	Results	Results Indicators	Outcome	Outcome Indicators
<p>Pillar 1: Knowledge and Capacity Building For Basin Management</p> <ul style="list-style-type: none"> • River Basin Modelling and Analysis; India • River Basin Modelling and Analysis; Bangladesh • Environmental and Social Management for Sustainable Hydropower in Bhutan 	<ul style="list-style-type: none"> • The State of the Brahmaputra River Basin Report • Basin sediment and erosion assessment report • Brahmaputra Basin hydrologic and climate GIS database • Guidance notes for sustainable HEP development 	<ul style="list-style-type: none"> • Improved capacity and knowledge sharing of the overall water resources and management situation in the Brahmaputra River Basin to inform basin management 	<p>3.1 <i>Number of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation</i></p> <p>3.2 <i>Number of water management organizations with technical capacity strengthened by SAWI activities in areas relevant to basin-scale planning or regional cooperation</i></p> <p>4.1 <i>Number of regional, basin/ landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers</i></p>	<ul style="list-style-type: none"> • New investments to reduce flood and erosion vulnerability developed by cooperative and consultative processes and informed by robust analysis • Improved coordination and cooperation among responsible agencies and stakeholders on erosion control and flood management 	<p>B1. <i>Value of investments secured through bilateral or multilateral governance processes that have been informed by Brahmaputra FA activities</i></p> <p>B2. <i>Quality of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed</i></p> <p>A1. <i>Number of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by Brahmaputra FA activities</i></p>
<p>Pillar 2: Reducing Vulnerability to Floods and Erosion</p> <ul style="list-style-type: none"> • Informing the Brahmaputra River Management Improvement Project • Support for Assam Flood, Erosion and Sediment Management Project • Hydro-met Modernization, Disaster Risk Management and Climate Resilience in Bhutan 	<ul style="list-style-type: none"> • Guideline for land accretion in the GBM Delta • Best practice for river bank improvement • Best practice for flood and erosion management • Hydro-met modernization data collection and modelling system 	<ul style="list-style-type: none"> • Improved investment planning and flood management and forecasting capabilities 	<p>5.1 <i>Number of basin or sub-basin level feasibility studies or intervention designs informed by SAWI activities</i></p>		

Brahmaputra Focus Area (continuation)

Activities	Output	Results	Results Indicators	Outcome	Outcome Indicators
Pillar 3: Stakeholder Dialogue <ul style="list-style-type: none"> Brahmaputra Basin Dialogue Brahmaputra IWRM Study Tour 	<ul style="list-style-type: none"> Meetings of Brahmaputra dialogue forum Disseminated Brahmaputra knowledge and results Science-to-Policy River Basin Modelling workshop IWRM Study Tour complete 	<ul style="list-style-type: none"> Increased dialogue processes among Brahmaputra Forum members and stakeholders for better understanding of benefits of coordinated management 	1.1 <i>Number of regional and basin/landscape dialogue meetings facilitated by SAWI</i>	<ul style="list-style-type: none"> Improved coordination among responsible agencies and stakeholders including between countries 	

Sundarbans Focus Area

Activities	Output	Results	Results Indicators	Outcome	Outcome Indicators
Pillar 1: Enhancing bilateral cooperation to support operationalization of the Sundarbans agreements <ul style="list-style-type: none"> Landscape-scale Joint Environmental Planning Sundarbans Dialogue and Joint Platform 	<ul style="list-style-type: none"> “Joint Platform” established and operating regularly “Joint Platform” landscape level dialogues organized A plan for a formal long-term institutional arrangement prepared Communities of practice established Number of High-level exchanges facilitated Number of enhanced media coverage of issues on Sundarbans Proposals on initial confidence building activities finalized and funding source identified 	<ul style="list-style-type: none"> Framework of cooperative arrangements established in the form of a “joint platform” to support operationalization of long term cooperative institutional arrangements Enhanced government and non-government dialogue processes for coordinated water resources management 	1.1 <i>Number of regional and basin/landscape dialogue meetings facilitated by Sundarbans FA</i> 2.1 <i>Number of basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making</i>	<ul style="list-style-type: none"> Improved coordination and cooperation among responsible agencies and stakeholders for joint sustainable management of the Sundarbans New investments planned to reduce vulnerability from extreme weather events and climate change impacts in the Sundarbans developed by cooperative and consultative processes and informed by robust analysis 	A1. <i>Number of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by Sundarbans FA activities</i> B1. <i>Value of investments secured through bilateral or multilateral governance processes that have been informed by Sundarbans FA activities</i> B2. <i>Quality of the planning processes underpinning new investments in terms of: (i) the breadth and strength of stakeholder consultation, (ii) a stronger technical basis for investment designs, and/or (iii) the pace at which investment designs are agreed</i>

Sundarbans Focus Area (continuation)

Activities	Output	Results	Results Indicators	Outcome	Outcome Indicators
<p>Pillar 2: Enhancing technical cooperation to support joint water resources management in the Sundarbans</p> <ul style="list-style-type: none"> • Sundarbans Hydro-met Design • Targeted Environmental Studies 	<ul style="list-style-type: none"> • A plan (with financing options) for improved hydro-met and weather forecasting • Adaptation plans for select vulnerable communities • Fisheries conservation plan • Habitat map for aquatic species important for community livelihood • A plan for establishing joint marine protected area • A plan for managing and adapting to increased salinity intrusion • A plan for providing safe and appropriate environs for the local communities • A program for a “regional coastal process study” • A web knowledge portal developed for public access to data for decision makers and other stakeholders • A water resources asset management plan • A scheme for innovative ecosystem management finalized • Proposals on joint actions finalized and funding source identified 	<ul style="list-style-type: none"> • Improved capacity and knowledge sharing for joint water resources management in the Sundarbans • Improved process of coordinated or joint actions for better planning of new investments that consider climate change, joint estuarine systems, and geomorphological characteristic in the Sundarbans 	<p>3.2 Number of water management organizations with technical capacity strengthened by Sundarbans FA activities in areas relevant to landscape -scale planning or regional cooperation</p> <p>4.1 Number of regional, landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers</p> <p>5.1 Number of regional, landscape or sub-basin-level feasibility studies or intervention designs informed by Sundarbans FA activities</p>		

Regional Cross-cutting Focus Area

Activities	Output	Results	Results Indicators	Outcome	Outcome Indicators
<p>Pillar 1: Increasing trust and confidence through dialogue and knowledge sharing</p> <ul style="list-style-type: none"> • Impacts of Climate Risks on Water, Hydropower and Dams • Snow and Glacier Contributions to River Flow • Climate Change in Water Resources Management • Small Grants Program – Himalayan University Consortium 	<ul style="list-style-type: none"> • Reports, papers and other knowledge products • Synthesis report on HUC research grants program • Tools for climate risk screening for HEP 		4.1 <i>Number of regional, basin/ landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers</i>	<ul style="list-style-type: none"> • Improved bilateral or multilateral governance processes, coordination, and policy decisions supporting regional water cooperation 	A1. <i>Number of existing or new bilateral or multilateral governance processes that support cooperative water management that have been informed by Regional Cross-cutting FA activities</i>
<p>Pillar 2: Capacity building for decision making</p> <ul style="list-style-type: none"> • Water Quality Monitoring, Data Analysis and Information Services • Capacity Building – Transboundary Water Governance • Capacity Building in Basin Planning and IWRM 	<ul style="list-style-type: none"> • University Partnership for Water Diplomacy • Mid-career level officials, water practitioners, students trained in water diplomacy (negotiation, transboundary water governance) and IWRM Report on State of IWRM in South Asia 	<ul style="list-style-type: none"> • Capacity strengthened to facilitate transboundary water cooperation and policy development 	3.1 <i>Number of professionals trained in the aspects of water management, water policy or water diplomacy relevant to basin scale planning and management or regional cooperation</i>		

Regional Cross-cutting Focus Area (continuation)

Activities	Output	Results	Results Indicators	Outcome	Outcome Indicators
<p>Pillar 3: Regional flood forecasting</p> <ul style="list-style-type: none"> Improving Regional Flood Forecasting 	<ul style="list-style-type: none"> Reports on options for improved forecasting methods Interactive web flood atlas for the Ganges basins 		<p>4.1 <i>Number of regional, basin/landscape or sub-basin-level knowledge products produced and shared with key stakeholders including decision makers</i></p>		
<p>Pillar 4: Dialogue processes</p> <ul style="list-style-type: none"> Regional Dialogue 	<ul style="list-style-type: none"> Face-to-face consultations with relevant stakeholders Two regional dialogue meetings with broadened participation Stakeholder analysis International conference on transboundary water topic Knowledge and data sharing Web-based dissemination platform and tools 	<ul style="list-style-type: none"> Increased regional dialogue processes among stakeholders for better understanding of benefits of coordinated management Improved knowledge production and sharing for regional cooperation in water management 	<p>1.1 <i>Number of regional and basin/landscape dialogue meetings facilitated by SAWI.</i></p> <p>2.1 <i>Number of regional, basin/landscape or sub-basin level participatory processes that support transboundary knowledge generation and sharing and stakeholder input to government decision making</i></p>		

Definitions

Governance process: formal or semi-formal ongoing governmental processes (including treaties, policies, agreements, MoUs, etc.) for making or operationalizing water management decisions. Includes processes for water data/information sharing, water planning, operational management and monitoring, as well as for negotiation and/or dispute resolution.

Participatory process: interactive process across multiple sectors (government organizations, non-governmental organizations, representatives, civil society, research community, and media) for giving, getting and exchanging information with relevant stakeholders on regular basis; securing widest possible engagement of relevant stakeholders to inform community, or authority or both.

Knowledge product: published book, report, paper, webpage or website that presents new knowledge relevant to management of the Himalayan River systems.

Feasibility study: documented assessment of the practicality of a proposed plan or method.

Intervention: infrastructure or other investment project (for example, ecosystem restoration work), water or environmental management policy, guideline or plan.

Stakeholders: decision makers, government representatives, affected communities, academia, media, civil society, and opinion leaders with interest or stake in basin/landscape scale water management and/or regional cooperation.

Organization capacity: infrastructure/equipment and human resources (quantity and expertise) that enable an organization to fulfill its responsibilities.



Appendix 3 – Financial Report FY15

The cumulative commitment to approved activities at the end of FY15 total US\$19.3 million which represents the whole amount received in paid-in contributions at that time. Total disbursements in FY15 were US\$2.6 million, and cumulative disbursements since the inception of the trust funds equaled US\$4.8 million with an additional US\$5.6 million in contract commitments. 7 percent of the total paid-in contributions has been allocated according to the terms of the administration agreement for the management and administration of the program. During FY15 implementation, a grant was set up for strategic communications supporting the implementation of the SAWI Communications Strategy, which ensures that new knowledge generated by SAWI is shared widely with interested stakeholders. Details are provided in Table 3.1 below. Financial statements of the trust fund are provided to all development partners via the Donor Center website.

Table 3.1: Summary Financial Information for SAWI Program and Focus Areas since MDTF Inception (in US\$)

Focus Area	Allocated to Approved Activities	Planned Expenditure for FY15	Actual Expenditure for FY15	Actual Cumulative Expenditure since MDTF Inception	Contract Commitments
I	1,423,559	750,000	301,787	835,020	53,740
G	9,747,302	2,600,000	516,462	842,866	3,713,401
B	2,079,507	1,600,000	532,232	834,569	209,399
S	1,750,000	1,000,000	361,791	365,589	776,457
X	2,464,933	1,800,000	587,852	1,010,587	665,306
PM	1,333,604	300,000	139,556	764,771	7,908
COM	500,000	N/A	189,916	189,916	177,799
Total	19,298,905	8,050,000	2,629,596	4,843,319	5,604,010

Legend: **I**: Indus; **G**: Ganges; **B**: Brahmaputra; **S**: Sundarbans; **X**: Regional Cross-cutting; **PM**: Program Management; **COM**: Communications

Table 3.2: Disbursement by Grant^{1,2} and Focus Area (as of June 30, 2015)

Grant	Grant Name	Grant Amount (US\$)	Actual Expenditure for FY15 (US\$)	Actual Cumulative Expenditure Since MDTF Inception (US\$)
Program				
TF014265	Program Administration & Management	1,333,603	139,556	764,770
TF017869	Strategic Communications	500,000	189,916	189,916
Indus Basin Focus Area				
TF014935	Indus FA Engagement ³	271,734	38,879	271,734
TF016430	Integrated Management of the Kunar River Basin	450,000	125,168	329,997
TF015737	Project Development: Glacier Monitoring in the Upper Indus Basin	101,824	6,275	101,824
TF018455	Indus Basin Dialogue	500,000	144,628	144,628
Ganges Basin Focus Area				
TF015480	SAWI Ganges FA Engagement ³	348,611	22,206	348,611
TF018717	Ganges Strategic Basin Planning	4,000,000	201,012	201,012
TF018129	Sustainable Water Resources Development for HEP	1,700,000	102,631	102,631
TF018488	Water Resources Management in Transboundary Basins	500,000	97,375	97,375
TF018509	Ganges Basin Dialogue	500,000	93,235	93,235
Brahmaputra Basin Focus Area				
TF015001	Concept Note Development Brahmaputra FA ³	195,807	0	195,807
TF016429	Brahmaputra River Basin Assessment	450,000	13,839	35,525
TF017526	Brahmaputra IWRM Study Tour	183,699	142,415	183,699
TF018637	Hydro-met Modernization in the Brahmaputra Basin	250,000	68,660	68,660
TF017496	River Management Improvement (Bangladesh)	350,000	201,281	206,929
TF016291	Flood and Erosion Management in NE India	150,000	2,305	40,217
TF018849	Brahmaputra Dialogue	500,000	115,305	115,305

Grant	Grant Name	Grant Amount (US\$)	Actual Expenditure for FY15 (US\$)	Actual Cumulative Expenditure Since MDTF Inception (US\$)
Sundarbans Landscape Focus Area				
TF017032	SAWI Sundarbans FA Engagement ³	450,000	308,391	312,189
TF0A0121	Sundarbans-Targeted Environmental Studies	500,000	53,399	53,399
Regional Cross-Cutting Focus Area				
TF015757	Regional Cross-Cutting FA Engagement ³	252,365	56,587	252,365
TF017907	Climate Change Impacts on HEP	275,000	66,711	66,711
TF018522	Snow/Glacier Contributions to Streamflow and Climate Change Impacts	150,000	46,500	46,500
TF016326	Transboundary Risk Management and Data Sharing	200,000	84,155	98,544
TF018290	Improving Watershed Management	65,000	9,487	9,487
TF016290	Learning Innovative Approaches to Glacier Monitoring to Address Climate Change Challenges	212,567	0	212,567
TF018731	Preparation for Flood Forecasting Services in the Region	500,000	81,143	81,143
TF018768	Capacity Building – Transboundary Water Governance	350,000	66,910	66,910
TF019090	Capacity Building – WQ Monitoring & Analysis	310,000	35,426	35,426
TF018766	Regional Dialogue	150,000	140,054	140,054

¹ Grants approved towards the end of FY15 which have had no disbursement in FY15 are not included.

² All grants in this table were executed by the World Bank.

³ This grant pertains to a previous implementation approach and was closed as it is not relevant to the current implementation approach.

Appendix 4 – FY15 Publications

This list includes publications supported entirely or partially by SAWI resources.

Acreman, M., and R. Hirji. 2015. “Summary Report – Workshop on Environmental Flows for Strategic Planning for the Ganga Basin.” World Bank, Washington, DC.

Harinath, A.S., P. Dogra, T. Paul, K.M. Gaba, and R. Mittal. 2015. “Study on Assessing and Strengthening Monitoring and Institutional Mechanisms for Appropriate Environmental Flows.” Final Report. Austrian Partnership Trust Fund and South Asia Water Initiative. Washington, DC.

Ray, P., Y. Yang, S. Wi, A. Khalil, V. Chatikavanij, and C. Brown. 2015. “Room for Improvement: Hydroclimatic Challenges to Poverty-Reducing Development of the Brahmaputra River Basin.” *Environmental Science & Policy*. 54 (12): 64-80.

Vasily, Laurie, Bill Young, Philippus Wester and Dipak Gyawali. 2015. *Proceedings of the South Asia Regional Fulbright Alumni Workshop on the Water-Energy-Food Nexus 2015* (workshop held in Kathmandu). World Bank, Washington, DC.

World Bank. 2015. “National Workshop on Integrated Water Resources Management Summary Report” (workshop held in New Delhi). World Bank, Washington, DC.

World Bank. 2015. “Transboundary Media Workshop on Challenges and Management of Sundarbans Landscape: Finding a Shared Way Forward on Sundarbans” (workshop held aboard the MV *Paramhansa* ship, locations in Bangladesh and India). World Bank, Washington, DC.

World Bank. 2014. “International Workshop on Risk Management and Adaptation to Climate Change for Sustainable Growth in Deltaic Regions” (workshop held in Kolkata). World Bank, Washington, DC.



Appendix 5 – FY16 Implementation Plan

The South Asia Water Initiative (SAWI) is a five-year (2013–2017) US\$32M multi-donor trust fund that aims to increase regional cooperation in the management of the major Himalayan river systems in South Asia to deliver sustainable, fair and inclusive development and climate resilience. The trust fund program is structured into five Focus Areas: the three major Himalayan river basins of South Asia (Indus, Ganges and Brahmaputra), the Sundarbans Landscape and Regional activities. The program is framed by Focus Area strategies and a program results framework.

SAWI Focus Area strategies identify pillars that describe areas of activity designed to directly or indirectly increase cooperation in water management across countries of the region. The results framework is structured around outcome indicators that measure *improved governance* and the value and quality of *new investments* that have been informed by SAWI activities. The program aims to inform six bilateral or multilateral governance processes (new or improved existing processes) and inform US\$1.5 billion of investment through improved planning processes. The results framework also includes intermediate results indicators that will be used to measure: (i) increases in trust and confidence in regional or basin water management as a result of dialogue processes, (ii) strengthening of stakeholder inputs to government decisions as a result of participatory processes that facilitate transboundary knowledge generation and sharing, (iii) strengthening of the capacity of water resources organizations in areas relevant to transboundary cooperation, (iv) increases in accessible regional, basin or sub-basin-level knowledge, and (v) design of regional, basin or sub-basin-level interventions that improve livelihoods and ecosystem sustainability.

Guided by ongoing consultations with governments, World Bank management, donors and key stakeholders, SAWI activities are designed consistent with the approved program strategies to: (i) increase support to strengthening water management at the national level in the major river basins through technical assistance and support to World Bank investments, (ii) build regional cooperation in capacity building, analytical work and modelling, and (iii) link these efforts through basin and regional dialogue focused on improving governance and identifying joint investments. The activities supported by the program are formally reviewed annually by an internal Steering Committee. The progress for the prior year and the implementation plan for the year ahead are discussed annually with trust fund donors.

The implementation plan for FY16 presents the theory of change for each Focus Area and indicates how the 32 approved activities will deliver on Focus Area and program objectives. The current portfolio of activities has a total value of around US\$26 million with planned FY16 expenditure of US\$8.8 million.

	(US\$)	Total	FY16
SAWI Program Objective: To increase regional cooperation in the management of the major Himalayan river systems in South Asia to deliver, fair and inclusive development and climate resilience		\$1.8M	\$0.5M
Activity 1: Program Management Activity 2: Communications and Knowledge Management			
Indus Basin Focus Area Objective: To improve water resources management and coordination among the riparian countries, Afghanistan, China, India and Pakistan, to enhance water and energy security		\$2.2M	\$0.5M
Pillar 1 – Long-term Basin Development and Investment Planning Activity 1.1: Groundwater Management in the Punjab (New in FY16)			

	(US\$)	Total	FY16
Pillar 2 – Investments and Capacity Building for Water and Energy Security			
Activity 2.1: Strategic Analysis of HEP Potential of the Kunar Basin (Closing in FY16)			
Activity 2.2: Institutional Options for HEP in the Kunar Basin (Deferred from FY15)			
Pillar 3 – Basin-Level Dialogue			
Activity 3.1: Indus Dialogue (Continuing)			
Ganges Basin Focus Area		\$10.7M	\$2.6M
Objective: To improve management and development of water resources in the Ganges Basin to support economic growth and improve resilience to climate variability and change			
Pillar 1 – Valuing the Environment and Ecosystem Services			
Activity 1.1: Strategic Basin Planning for the Ganges in India (Continuing)			
Activity 1.2: Sustainable Water Resources Development for HEP in Nepal; Bank-executed (Deferred from FY15)			
Activity 1.3: Sustainable Water Resources Development for HEP in Nepal B; GoN-executed (Deferred from FY15)			
Activity 1.4: Managing Watershed to Reduce Sediment in Hydropower; Nepal (New in FY16)			
Pillar 2 – Moving from Data to Information Services			
Activity 2.1: Support for Water Resources Management in Transboundary Basins (Continuing)			
Activity 2.2: Flood Forecasting in the Bagmati Sub-basin; Bank-executed (New in FY16)			
Activity 2.3: Flood Forecasting in the Bagmati Sub-basin; Government of Bihar-executed (New in FY16)			
Pillar 3 – Basin-level Dialogue			
Activity 3.1: Ganges Basin Dialogue (Continuing)			
Brahmaputra Basin Focus Area		\$3.3M	\$1.0M
Objective: To improve the shared understanding and management of the Brahmaputra Basin as means to strengthen resilience and economic growth for the riparian countries			
Pillar 1 – Knowledge and Capacity Building for Basin Management and Investment Planning			
Activity 1.1: River Basin Modelling and Analysis in India (Deferred from FY15)			
Activity 1.2: River basin Modelling and Analysis in Bangladesh (Deferred from FY15)			
Activity 1.3: Environmental and Social Management for Sustainable Hydropower in Bhutan (New in FY16)			
Pillar 2 – Reducing Vulnerability to Floods and Erosion			
Activity 2.1: Informing the Brahmaputra River Management Improvement Project (Continuing)			
Activity 2.2: Hydro-met Modernization, Disaster Risk Management and Climate Resilience (Continuing)			
Pillar 3 – Basin-level Dialogue			
Activity 3.1: Brahmaputra Basin Dialogue (Continuing)			
Sundarbans Landscape Focus Area		\$2.7M	\$1.0M
Objective: To operationalize joint management of the Sundarbans for sustainable development that delivers mutual benefits for the two countries			
Pillar 1 – Enhancing Bilateral Cooperation			
Activity 1.1: Landscape-scale Joint Environmental Planning (Continuing)			
Activity 1.2: Sundarbans Dialogue and Joint Platform (Continuing)			
Pillar 2 – Technical Cooperation to Support Joint Management			
Activity 2.1: Sundarbans Hydromet Design (Continuing)			
Activity 2.2: Targeted Environmental Studies (Continuing)			
Regional Cross-Cutting Focus Area		\$6.0M	\$2.2M
Objective: To build knowledge and capacity across the region in support of transboundary basin dialogue and cooperation			
Pillar 1 – Knowledge Related Activities			
Activity 1.1: Impacts of Climate Risks on Water, Hydropower and Dams (Closing in FY16)			
Activity 1.2: Snow and Glacier Contributions to River Flow (Closing in FY16)			
Activity 1.3: Climate Change in Water Resources Management (Deferred from FY15)			
Activity 1.4: Small Grants Program – Himalayan University Consortium; ICIMOD-executed (New in FY16)			

	(US\$)	Total	FY16
Pillar 2 – Capacity Building Activities			
Activity 2.1: Water Quality Monitoring, Data Analysis and Information Services (Continuing)			
Activity 2.2: Capacity Building – Transboundary Water Governance; Bank-executed (Continuing)			
Activity 2.3: Capacity Building – Transboundary Water Governance; international Union for Conservation of Nature (IUCN)-executed (New in FY16)			
Activity 2.4: Capacity Building in Basin Planning and IWRM (Deferred from FY15)			
Pillar 3 – Regional Flood Forecasting			
Activity 3.1: Improving Regional Flood Forecasting (Closing in FY16)			
Pillar 4 – Dialogue Processes			
Activity 4.1: Regional Dialogue (Continuing)			
TOTALS		\$26.7M	\$7.9M

Program Management, Communications & Knowledge Management

Two grants have been established to cover: (i) Program Management and (ii) Communications and Knowledge Management. The former grant is 7 percent of all contributions and is the management “fee” referred to in the Administrative Agreements; this fee is taken from each contribution payment.

Activity 1 – Program Management (Total US\$1.3M, FY16 US\$0.2M)

The program is mapped to the South Asia Regional Vice President’s (SARVP) office that has the ultimate responsibility for program delivery. Trust Fund administration is undertaken by the Development Effectiveness unit in SARVP. On a day-to-day basis the program is managed by a small Secretariat team in the Water Global Practice. The program management grant supports strategic oversight and coordination of the program across all Focus Areas and activities, financial management, annual progress reporting and donor liaison including the annual donor meeting. Donor liaison includes the governance processes as laid out in the administrative agreements, interactions (especially via an annual forum) with the partner organizations funded by DFAT Australia under their South Asia Sustainable Investment Program and the annual review process of the DFID South Asia Water Governance Program.

Activity 2 – Communications and Knowledge Management (Total US\$0.5M, FY16 US\$0.3M)

This activity supports implementation of the SAWI Communications and Engagement Strategy with a long-term goal to create an enabling environment for cooperation at the basin level. This includes advocacy, awareness building, dissemination and engagement with key stakeholders (government officials, NGOs, academia, civil society groups and the media). The activity works upstream to strengthen the positioning of SAWI’s mandate at Track II events, national and international workshops and conferences, and extends support to Focus Area activities towards the delivery of programmatic results. It is supporting a strategic review of options for the SAWI Knowledge Portal to provide a more user-friendly, open-access platform for delivery of a wide range of water-related regional or basin-scale data sets relevant to water resources management, as well as development of customized versions of the World Bank’s recently released “Spatial Agent” app for each river basin. The strategic review of the SAWI Knowledge Portal will be completed in FY16 and recommendations of the strategic review will be subsequently implemented. It is likely that the Knowledge Portal functionality will be implemented separately from the programmatic SAWI website. The activity is also funding a compilation (by Chatham House) of stories of water cooperation success in South Asia that will be completed in FY16.

Indus Basin Focus Area

Objective: To improve water resources management and coordination among the riparian countries, Afghanistan, China, India and Pakistan, to enhance water and energy security.

Focus Area Theory of Change

Given complex water challenges, high glacier dependency and growing per capita scarcity, the Indus is considered the most vulnerable river basin in Asia. The uneasy relationship between riparian countries, different levels of capacity and the presence of a fragile, post-conflict country in the basin pose additional challenges to the promotion of regional cooperation in water resources management. Given the World Bank's role in the 1960 Indus Waters Treaty and the importance of engaging in a neutral way in the basin, SAWI continues to maintain transparency about World Bank engagement in the Indus Basin. In response to communications from key riparian stakeholders, the investment in this Focus Area has been decreased and will focus on geographic spaces and issue areas not falling under the purview of the Indus Waters Treaty.

Focus Area activities will focus on tractable efforts where client demand is clear, including: (i) bilateral dialogue and facilitation of institutional development regarding joint HEP development in the Kabul/Kunar Basin, (ii) identification of the needs for and provision of technical assistance at the national level to enhance transboundary (including inter-provincial boundaries) water resources management capacity, (iii) support to conjunctive surface-groundwater management with a focus on Punjab, and (iv) continued support to the basin dialogue (commenced in 2013) focusing on development of a joint research activities on climate change impact in the Indus Basin. Activity (ii) will focus primarily on Afghanistan and also Pakistan to mitigate for cross-basin differences in country capacity.

Pillar 1 – Long-term Basin Development and Investment Planning

Activity 1.1 – Groundwater Management in the Punjab (Total US\$0.6M, FY16: US\$0.15M)

In Pakistan, water availability per capita has decreased from 1,299 m³ in 1996-97 to only 987m³ in 2010-11. The overall annual water availability in the Indus basin is about 175 BCM (billion cubic meters) with respect to surface and groundwater. Notwithstanding the existence of a vast system for supply of surface water, groundwater abstraction has increased from 10 BCM in 1965 to 70 BCM currently, with more than one million tube-wells in operation. Excessive mining of groundwater has already led to the lowering of the water table over vast parts of the country, groundwater pollution, land subsidence, saltwater intrusion, and loss of wetlands and riparian habitats. Unconfined aquifers in upper and central Punjab in Pakistan bordering neighboring Indian states are contiguous and continuous. Uninformed groundwater exploitation across the border may aggravate the already bleak situation particularly when, on either side of the border, there is no regulatory framework to manage the groundwater resource.

Building on the groundwater balance assessment carried out under the WCAP (P110099), this activity will support activities to address the adverse consequences of groundwater development through: (i) sensitization of policy makers and provincial water management agencies about the importance of conjunctive surface-groundwater management; (ii) technical assistance and capacity building with respect to artificial recharge; (iii) aquifer level salt balance analysis, pollution management and environmental impact analysis on ecological resources like wetlands in the Basin; and (iv) development of a comprehensive action plan to strengthen institutional and legal frameworks.



Pillar 2 – Investments and Capacity Building for Water and Energy Security

Activity 2.1 – Integrated Management of the Kunar River Basin (Total US\$0.5M, FY16 US\$0.1M)

The Kunar province in Afghanistan and the Kyber Pakhtun Khwa (KPK) province in Pakistan represent one of the most volatile conflict-affected areas in the region. Access to adequate and reliable energy is a major constraint to economic growth. The strategic location and potentially transformational nature of HEP projects offer unique opportunities to enhance energy security for both countries, and to foster regional peace and shared prosperity.

This activity will improve knowledge of the Kunar Basin resources to both support Bank teams and senior management, as well as guiding the two governments, as to the feasibility and best approach to develop the Kunar Basin hydro power potential. Four background studies are being undertaken: (i) an integrated Kunar River Basin assessment, (ii) a review of existing pre-feasibility and feasibility studies, (iii) a political economy assessment of the international, national and local context, and (iv) an institutional options paper. These studies are now largely complete and will be finalized in FY16 prior to closure of the activity.

Activity 2.2 – Institutional Options for HEP Development in the Kunar Basin (Total US\$0.6M, FY16 US\$0.2M)

Based on studies conducted under Activity 2.1 above SAWI will support facilitation of dialogue to achieve enhanced coordination between Pakistan and Afghanistan on the development of the hydropower potential in the Kabul/Kunar Basin. Specific project engagements, such as Kunar HEP development, the Naghlu Dam rehabilitation and enhancements to the Kabul water supply, will be used as entry points to facilitate riparian dialogue with a view to increase regional cooperation. The activity will also conduct capacity building workshops in FY16.

Pillar 3 – Basin-level Dialogue

Activity 3.1 – Indus Dialogue (Total US\$0.5M, FY16 US\$0.2M)

This activity will support dialogue in the Indus Basin including the Indus Forum and a Pakistan national dialogue. The Indus Forum brings together senior government and non-government participants from the four Indus riparian countries. The activity will finance meetings and exposure visits of participants of the Indus Forum; it has linked up to other relevant Track II dialogue processes and research groups, such as the Atlantic Council Indo-Pak Dialog and the Upper Indus Basin Initiative and Hi-AWARE project both facilitated by ICIMOD, in order to build confidence and trust amongst riparian countries to create an enabling environment for basin-wide cooperation.

The activity focuses on technical collaboration on issues previously identified by the Forum, including (i) establishment and facilitation of a Technical Working Group for joint work on assessing climate change impact on the basin's cryosphere and hydrology, (ii) facilitation of PMD (Pakistan Meteorological Department) and China support to enhance capacity at the Glacier and Permanent Snow Survey Department of the Ministry of Energy and Water in Afghanistan, and (iii) exploration of opportunities to support PhD/Master students and mid-career professionals from riparian countries to train at universities in the basin. Linking to Activity 1.1, this activity will facilitate a Pakistan national dialogue process in order to implement the recommendations from the 2013 Pakistan Water Summit with key stakeholders to identify specific opportunities for water sector reform and investment.

Ganges Basin Focus Area

Objective: To improve management and development of water resources in the Ganges River Basin in order to support economic growth and to improve resilience to climate variability and change.

Focus Area Theory of Change

Countries in South Asia are unlikely to cooperate for effective basin management if water resources are not well managed nationally. The strategy for the Ganges Focus Area is therefore to actively support improved water resources management in each riparian country and to facilitate connections between countries through technical dialogue and capacity building. As well as improving water management nationally for economic and poverty reduction outcomes, these connected efforts are expected to also build confidence in transboundary engagement and increase trust around knowledge and information exchange. In India, working to improve bidirectional data sharing between the center and the states is seen as a necessary precursor to broader public and international transparency.

In both India and Nepal, SAWI will support river basin planning. In Nepal, this will be carried out via the accelerating development of HEP (with associated work on watershed management for sediment control), and in India, this will initially be around the drive for river clean-up but will also encompass environmental flows for a healthy river, cross-sectoral water allocation and inland navigation. Work under the Ganges Focus Area will also support the design and implementation of the National Hydrology Project in India that will promote improvements in basin modelling and basin planning and more open data access and sharing.

Scoping work on flooding conducted in FY15 under the Regional Focus Area has led to new activities on operationalizing flood forecasting in the Ganges Basin at the sub-basin-level; this work in the Bagmati sub-basin will build technical competence, improve forecasting skill and seek to establish cross-border cooperation in flood management between Bihar and Nepal. Again this work will guide larger scale and longer-term efforts in flood forecasting planned under the National Hydrology Project.

For Bangladesh, as the lower riparian, the major issues remain flooding and access to dry season flows. These issues will primarily be picked up through dialogue facilitated under the Brahmaputra Focus Area, which will be a sub-regional dialogue rather than solely basin-focused. SAWI actively engages in dialogue with key influencers in Bangladesh with a view to strengthening and focusing discussions with the upper riparians around river basin planning, inland navigation and benefit sharing from HEP. Total investment in the Focus Area has increased in response to the high level of government interest in the Basin including for sustainable hydropower development in Nepal and on river clean-up and waterway navigation in India.

While the work under Pillar 1 will contribute significantly to the environmental aspects of water management in India and Nepal, the work is being badged as “river basin planning” given the increasing interest in all countries to adopting a basin approach to water management. The work originally envisaged under Pillar 2 on joint flood forecasting has been recast as a sub-regional (rather than basin) activity, and is now mapped to the Regional Focus Area. The activity below under Pillar 2 is relevant to the Ganges and Brahmaputra basins but as it is wholly within India it has not been mapped to the Regional Focus Area; this activity will link closely with the work on regional data and information systems under the program-wide Communications and Knowledge Management activity.

Pillar 1 – Valuing the Environment and Ecosystem Services

Activity 1.1 – Strategic Basin Planning (Total US\$4.0M, FY16 US\$1.1M)

This activity will engage closely with the Central Water Commission, the National Institute of Hydrology, the National Mission Clean Ganga and the Ganga Knowledge Centre, as well as relevant state



government agencies. The activity will have three sub-activities: (i) basin scale modelling, (ii) surface-groundwater interactions, and (iii) environmental flows. It will interface with current World Bank investments (particularly the National Ganga River Basin Project and the Uttar Pradesh Water Sector Restructuring Project) and planned investments (particularly the National Hydrology Project, and the Improving Navigation Infrastructure on National Waterway Project).

The activity will develop a comprehensive basin model for the Ganga in India that enables objective assessment of the likely effectiveness of different options for improving river health and the impacts these options on the ability to meet consumptive water demands and support inland waterway navigation. The activity will use the World Bank's close relationship with government around existing and proposed investments as the entry point for dialogue and technical support on strategic basin planning. The technical support will focus on river basin modelling, but will be supported by work on surface-groundwater interactions and environmental flows, which are both poorly understood dimensions of water management in the Ganga Basin. The former is critical for understanding the dynamics of low flows and for determining the conjunctive strategies for meeting irrigation demands. The latter is critical to complement work on river "clean-up" in support of river health outcomes.

Following a competitive procurement process in the second half of FY15, a contract for this work has been signed with Deltares (Netherlands) and substantive work will commence early in FY16.

Activity 1.2 – Sustainable Water Resources Development for HEP (BE) (Total US\$1.7M, FY16 US\$0.4M)

This activity is linked to the Power Sector Reform and Sustainable Hydropower Development project. The client is the Water and Energy Commission Secretariat in the Ministry of Irrigation, Nepal. The activity will enhance the Government of Nepal's capacity for facilitating improved water resources management and development by: (i) increasing awareness across the GoN and other stakeholders of river basin planning as a holistic approach to developing environmentally sustainable hydropower in a way that achieves a socially, economically, and environmentally balanced use of basin water resources; (ii) facilitating institutional and regulatory reform in the water resources sector to sustainably promote water resource development as a platform for growth; and (iii) building capacity for environmental and social safeguard management to facilitate technically, socially, and environmentally sustainable and equitable water resource and hydropower development. By strengthening capacity in the GoN and supporting river basin planning and improved water management, the activity will enable the GoN to engage in a more informed and more confident way with downstream riparian countries in the formal transboundary discussions and negotiations that are increasingly taking place. The activity will support river basin modelling and advocate for a consistent, compatible and more complete modelling platform for the entire basin.

Implementation of this activity in FY15 did not commence as the matching recipient-executed grant is additional financing to an IDA credit, the approvals of which were significantly delayed. Once the IDA credit is approved, work will commence. Full implementation is expected to require the proposed two-year extension to the SAWI trust fund.

Activity 1.3 – Sustainable Water Resources Development for HEP (RE) (Total US\$2.8M, FY16 US\$0.5M)

This recipient-executed activity in Nepal is linked to the Power Sector reform and Sustainable Hydropower Development Project. The implementing agency is the Water and Energy Commission Secretariat (WECS) in the Ministry of Irrigation, Nepal. The activity will support WECS in the preparation of river basin plans for the Kosi, Gandaki, Karnaili and West Sapti basins in Nepal. The activity is currently being designed in discussion with WECS.

As indicated above, this grant is supplementary to an IDA credit approval which was delayed in FY15. Following the earthquakes in Nepal in late April 2015, some resign of the activity was undertaken to

embrace longer-term resilience in the HEP sector, as well as short-term assessments of impact on HEP facilities and construction.

Activity 1.4 – Managing Watersheds to Reduce Upstream Sediment for HEP (Total US\$0.2M, FY16 US\$0.2M)

Recognizing the need for upstream sediment management, the Kali Gandaki project includes a US\$0.9M sub-component (Catchment Area Treatment Plan) to manage sediment through investments in the upper catchment which covers an area of 7,618 km². Management of sediment, in turn, requires the identification of vulnerable areas, and targeted erosion control activities at the basin level. The project is currently funding a basin-wide study to identify the key erosion prone areas and activities that are likely to enhance erosion and sedimentation in the future. This grant will complement the ongoing and planned project activities by supporting the identification of a portfolio of investments that can help control erosion in the catchment and minimize its flow into the facility. Specifically the grant will be used to support project implementation by: (i) identifying and prioritizing investments in the upstream catchments to reduce sediment inflow to the Kali Gandaki A Hydropower Plant; (ii) building capacity within Nepal Electricity Authority and other relevant departments to apply tools and processes for improved watershed management; and (iii) facilitating knowledge exchange and dissemination of upstream sediment management approaches to other countries.

Pillar 2 – Moving from Data to Information Services

Activity 2.1 –Water Resources Management in Transboundary Basins (Total US\$0.5M, FY16 US\$0.2M)

The World Bank is preparing a third phase of the successful Hydrology Project in India – to be called the National Hydrology Project. Prior projects were restricted to peninsular India, but the government has now requested support in the states of Ganges and Brahmaputra basins which will be the focus for the third phase, signaling the lessening of the sensitivity on engaging on international basins. The Hydrology Project has a strong heritage of improving the capture, management and use of water data. The new project will focus more on the use of water data in planning and management, including via modelling in support of basin planning and basin water resource assessments, flood management and reservoir operations. In FY15, SAWI support enabled access to international expertise in modelling, hydro-met systems and IWRM. In FY16 support is expected to ensure strong linkages to the SAWI-supported strategic basin planning work and other the analytical work on the Ganges, including through basin modelling workshops and study tours. Increasingly, opportunities will be sought for participation by technical staff from government agencies of other riparian countries and exposure to international best practice in data management and basin modelling.

Activity 2.2 – Bihar Flood Management Information System (FMIS) Flood Forecasting (Total US\$0.5M, FY16 US\$0.2M)

This is a new activity in FY16 and is an outcome of the scoping studies in flood forecasting undertaken in FY15. It is a Bank-executed activity to support the recipient-executed activity 2.3 below to operationalize flood forecasting in the Baghmata-Adhwara Basin in Bihar (see 2.3 below). Bilateral agreements between India and Nepal to share hydro-met data provides an opportunity to pilot 7–10 day flood forecasting services that inform both community preparedness and early flood response by the Bihar Government.

The activity support capacity building including: (i) visits of international experts to provide training in basin scale operational flood forecasting methods and technologies and in effective community outreach; and (ii) workshops with international and national experts on modelling-related topics including the use of free-to-use (open source) modelling software suite of models. Experienced consultants will be contracted to provide continuous technical support for: (i) procuring, managing and operationalizing the flood modelling system; (ii) community outreach mechanisms; (iii) planning capacity building in food



forecasting services; and (iv) institutionalizing improved and sustained modelling skills. Through these activities engagement with Nepal as the upstream riparian will be facilitated with a view to strengthening the upstream-downstream collaboration in flood management across the border.

Activity 2.3 – Strengthening FMIS Capacity in Bihar Basin (Total US\$0.5M, FY16 US\$0.2M)

This is a recipient-executed activity in FY16 and is an outcome of the scoping studies in flood forecasting undertaken in FY15. The objective of the activity is to strengthen the Government of Bihar’s institutional capacity and tools/models in operational flood forecast and inundation modelling and to improve community outreach for flood risk management in the Bagmati-Ahwarra basin (within the Ganges Basin). This will include support to: (i) institutionalize the meteorological framework for ensemble short- and medium-range precipitation forecasts and high frequency rainfall estimates for operational (day-to-day) model runs; (ii) extend the existing flood forecast model to cover the whole basin from Hayaghat to Dumri, confluence with Kosi River Basin; (iii) set up open source distributed flood forecasting models to compare and improve modelling capacities of FMIS, Bihar; and (iv) to develop effective community alerts and communications for improved flood risk management.

Pillar 3 – Basin-Level Dialogue

Activity 3.1 – Ganges Dialogue (Total US\$0.5M, FY16 US\$0.15M)

This activity will support national and basin-wide dialogue linked to the country-level technical Ganges activities. There will be a strong emphasis on river basin planning and on cooperative opportunities in hydropower and inland navigation. Dialogue through the World Bank’s Regional Champions Group on river basin planning, will be initially led from Bangladesh and then engage with Nepal, in order to increase their confidence and ability to engage in dialogue with India in a more informed way. Opportunities will be actively sought to informally engage at technical and policy levels in all countries on these and other relevant issues. The nascent Ganges Basin Modelling Community of Practice will become more active in FY16 linking to the substantive work in support of basin planning in both India and Nepal.

Brahmaputra Basin Focus Area

Objective: To improve the shared understanding and management of the Brahmaputra River Basin as a means to strengthen resilience and support economic growth for the riparian countries.

Focus Area Theory of Change

Activities under the Brahmaputra Basin FA will be focused on addressing water-related challenges, such as flooding and river bank erosion, and assessing economic opportunities, including those from hydropower and navigation. Knowledge exchange activities, study tours and workshops and assessments conducted to support these issues will not only demonstrate the potential economic benefits from cooperative water management, but will provide a platform for riparian countries to come together and build the case for regional cooperation.

Pillar 1 will develop a shared knowledge base for the entire basin to support investment planning and decision-making. This will include relevant assessments and modelling, decision support tools to assist policy makers in making informed, analysis-driven decisions and capacity building activities within relevant agencies to operationalize these tools and make strategic, informed decisions. The knowledge base will support basin-wide river management, investment planning at a national and/or basin level, adaptive management in deltaic regions, flood and sediment management and exploring cross-sector opportunities such as hydropower and navigation.

Pillar 2 will focus on developing resilience of populations and reducing their vulnerability to water and climate-related risks. The Brahmaputra Basin is prone to natural disasters, including floods, erosion, channel migration, and earthquakes. These natural disasters have impoverishing impacts, as well as economic loss via infrastructure damage, loss of life and loss of fertile agricultural land. The pillar will adopt an adaptive management framework and strengthen the riparian countries' capacity to respond and adapt to changes in the basin. Activities will include: (i) improvements in existing infrastructure and instruments, including early warning systems, flood embankments and other hydraulic infrastructure; (ii) improving the understanding of river morphology and erosion trends vis-a-vis development of a basin-wide and/or nation-wide sediment accounting model; and (iii) capacity building, training and knowledge exchange activities, particularly focused on flood and erosion management.

Pillar 3 will provide a platform for riparian countries to discuss challenges and also identify opportunities for collaboration through study tours, workshops and conferences. The overarching aim is to improve co-operation through increasing opportunities to engage and discuss common challenges.

Pillar 1 – Knowledge and Capacity Building for Basin Management and Investment Planning

Activity 1.1 – River Basin Modelling and Analysis, India (Total US\$1.2M, FY16 US\$0.2M)

The original intent for the Brahmaputra was for a single activity on modelling and analysis spanning all riparians. This proved too difficult to implement given the sensitive politics of water in the region, and so with the approval of management, the activity has been redesigned in two parts – one in India and one in Bangladesh, with links between the two planned through dialogue and learning events.

The activity in India will undertake a strategic assessment of the Brahmaputra Basin within India, analyze development issues at a basin level and identify possible investment scenarios. The activity will undertake a strategic basin assessment in order to gain a better understanding of the dynamics of the river basin from a system-wide perspective. The activity will develop a robust basin-wide knowledge base and model suite for water resources assessment and strategic planning for the entire Brahmaputra Basin in India. The model will consider surface and ground water interaction, climate change impacts on water availability and use, flood and erosion issues as well as an assessment for other sectors like agriculture, hydropower and navigation would also be addressed. The activity will also support a multi-stakeholder consultation process to guide and share the work and capacity building in central and state agencies through training, and ensuring wide access to the models and analyses and supporting documentation. Operationally, this activity is likely to be linked to the programmatic window of activates.

Activity 1.2 – River Basin Modelling and Analysis, Bangladesh (Total US\$0.8M, FY16 US\$0.3M)

The activity on Bangladesh will build on the State of the Basin Assessment, commenced in FY14 to identify potential interventions or capacity-building areas that support the SAWI program objectives, and assist in further investment planning. Specific initiatives supported under this activity include: (i) development of basin-wide information database, (ii) development of a decision support platform for the Brahmaputra Basin in Bangladesh, (iii) workshops and knowledge exchange activities to enhance technical and institutional capacity, and (iv) support to short, medium, and long-term investment planning in the Ganges-Brahmaputra-Meghna (GBM) delta in Bangladesh. The work will explore a range of issues including the climate change impacts; options analysis for investment planning; impacts from development scenarios including hydropower development and interventions to improve irrigation productivity; and finally, recommendations for improving basin-wide water management. The activity will be a key part of a larger analytical study that aims to provide multi-sectoral solutions to delta management in Bangladesh. The activity will help give effect to the MoU signed by the governments of Bangladesh and the Netherlands, together with the World Bank, to advance Adaptive Delta Management in Bangladesh in the context of basin-wide planning and management.



Activity 1.3 – Environmental and Social (E&S) Impact of Hydropower in Bhutan (Total US\$0.2M, FY16: US\$0.2M)

This activity is in response to a request from the Royal Government of Bhutan, and aims to improve the environmental and social planning and management of hydropower in Bhutan. The activity will help to develop guidelines for basin planning and cumulative impact assessments. The activities under this project include a review of the current state of hydropower development through analysis and assessments, suggestions for improvements in the areas of E&S and its implementation and further recommendations for future hydropower development. The project will improve management of the Brahmaputra River Basin through more sustainable development of hydropower, especially from an environmental and social perspective, in the tributaries originating in Bhutan.

Pillar 2 – Reducing Vulnerability to Floods and Erosion

Activity 2.1 – River Management Improvement (Bangladesh) (Total US\$0.35M, FY16 US\$0.1M)

The River Management Improvement Project (US\$650M) will support on-ground investments and operations dealing with flood mitigation infrastructure to reduce the impacts of erosion and to channel migration in Bangladesh. The investment plans proposed under the program are expected to shape the future Brahmaputra Basin in Bangladesh. The SAWI activity will support broader consultation to inform the investment planning and to ensure international lessons learned as well as basin-wide aspects are taken into consideration. It will complement the separately financed project preparation work to enable a basin-scale perspective to guide the project design and to ensure transboundary impacts and opportunities are identified.

Activity 2.2 – Hydro-met Modernization in the Brahmaputra Basin (Total US\$0.25, FY16 US\$0.15M)

This activity is strengthening institutions, facilitating knowledge exchange and enhancing cooperation with respect to management of hydro-meteorological risks within South Asian countries. The activity is undertaking analytic work and technical assistance to strengthen the capacity of key institutions in the Brahmaputra River Basin countries to respond to cross-border water related hazards and climate risks. The work has developed a roadmap for South Asia countries to: (i) modernize hydro-meteorological monitoring, (ii) improve the accuracy and lead time for weather and flood forecasting, and (iii) enhance community based early warning systems. The activity will be completed in FY16.

Pillar 3 – Basin-Level Dialogue

Activity 3.1 – Brahmaputra Dialogue (Total US\$0.5M, FY16 US\$0.1M)

This activity will increase regional co-operation by providing a platform to discuss shared water challenges and opportunities. Dialogue, study tours and knowledge exchange events around focused issues will be undertaken to promote interaction among the Brahmaputra riparian countries. The aim is to create a neutral platform to share challenges and opportunities within the basin, which will lead to increased co-operation. Under this pillar, key stakeholders (including donor agencies, government, private sector and civil society) in the basin will also be identified more thoroughly and will be engaged in the dialogue process.

Sundarbans Landscape Focus Area

Objective: To operationalize joint management of the Sundarbans Landscape for sustainable development and to deliver mutual benefits for the two countries: Bangladesh and India.

Focus Area Theory of Change

The key challenges of the Sundarbans (i.e., extreme poverty, frequent natural disasters and erosion of ecosystem services) would be better managed if Bangladesh and India developed and implemented a

joint conservation and development policy, or at least collaborated on plans and programs. To-date, formal dialogue and collaboration between the two countries has been inadequate. While non-binding bilateral agreements were signed in late 2011 outlining a framework for collaboration in international waters, information-sharing, disaster management and addressing climate change-induced issues, these are yet to be implemented. SAWI directly supports implementation of the agreements, and support country-level actions based on an integrated basin perspective.

This will include developing a stronger analytical basis to help governments move towards integrated planning and management. Bilateral dialogue, research and information exchange will support the analytical work and will build technical capacity, enhancing cooperation. A landscape-level planning and management framework and support for institutions are required for collaborative management. Technical analyses will be complemented by: (i) advocacy work to generate public support for cooperation, (ii) establishment of governance arrangements for joint planning, and (iii) substantive joint actions (e.g., shared plans and policies) for conservation and sustainable development.

Given that broad agreement for collaboration exists, activities under the Sundarbans Focus Area will be demand-driven. The initial suite of activities was informed by stakeholder consultation. The aim is to establish a more formal mechanism for collaboration (so-called “Joint Platform”), which would guide future activity choices; in addition, all joint studies and joint planning and investments will be guided by multi-stakeholder dialogue processes.

Pillar 1 – Enhancing Bilateral Cooperation

Activity 1.1 – Landscape-scale Joint Environmental Planning (Total US\$0.5M, FY16 US\$0.2M)

All prior studies are based on only partial (single country) descriptions of the Sundarbans. This activity will develop a geomorphic Sundarbans narrative that combines existing single-country narratives so that stakeholders are able to appreciate the common challenges and common opportunities, without focusing on the differences of political-administrative organization. Sequentially thereafter, the activity will promote existing and new joint actions between Bangladesh and India. Enabling joint actions to continue beyond the life of SAWI support will promote sustainability of the Sundarbans initiative. The activity will undertake analytical work to identify, promote and judge the feasibility of existing and potential joint actions by institutions in Bangladesh and India, and will develop joint strategies and work plans, as well as providing initial incremental operating costs, for a few selected high-priority and feasible joint actions. Further detailed analyses could be taken up if requested by the governments.

In FY16, work will include: (i) drafting of combined Sundarbans narrative, multi-stakeholder discussions on the draft narrative, and agreement on the common features that will need to be incorporated to deliver the final landscape narrative to be delivered in the next FY; (ii) identification of enhancements of three to five of the potential joint actions, such as on the India-Bangladesh Inland Waterways Protocol Routes (where the analyses will suggest mechanisms for how institutions can collaborate and build better long-term cooperation apparatuses and instruments for implementation of the joint actions); and (iii) support to the Delta Plan initiative in Bangladesh.

Activity 1.2 – Sundarbans Dialogue (Total US\$1.0, FY16 US\$0.35M)

This activity will enhance trust and working relationships between the two countries at the landscape level in order to further the objectives of sustainable management of the Sundarbans based on country-specific needs and landscape-level priorities. The aim is to create ownership among the non-government and the government agencies alike and to facilitate the operationalization of the Bangladesh-India “in-principle agreements” on the Sundarbans. Formation of the Joint Platform will take time, and will require the support of thematic institutional networks, joint media campaigns, as well as increased collaboration among experts, academia and media. This activity will therefore support dialogue events,



workshops, roundtables, and study tours to facilitate the exchange around ideas, viewpoints, knowledge and development plans.

In FY16, the activity will support (i) preparation of a proposal for the establishment of a “Joint Platform” (joint working platform with formal participation of the respective governments) for guiding long-term planning and implementation of future collaborative work; (ii) multi-stakeholder dialogues, including at least two bilateral meetings, one international workshop, two workshops in Kolkata and Khulna, one dialogue event among print and electronic media of both countries, and at least ten local roundtables; (iii) preparation of a joint media collaboration plan; (iv) preparation of local adaptation and infrastructure plans for at least five small urban areas; and (v) a draft vision document for long-term cooperation and collaboration between Bangladesh and India. In these above sub-activities, the aim is to increase awareness among stakeholders and citizens, including aiming to influence individual and community behavior with respect to conservation of biodiversity and water resources. Existing web-based knowledge portals will be supported where appropriate. In preparation and implementation of each of the above, the two respective governments will be engaged, so that these activities could lead in the future to formal joint actions.

Pillar 2 – Technical Cooperation to Support Joint Management

Activity 2.1 – Sundarbans Hydro-met Design (Total US\$0.4M; FY16 US\$0.15M)

This activity will help the two countries establish appropriate information (collection, collation and dissemination) systems in order to prepare and implement development and conservation plans for the Sundarbans including increased resilience. While several initiatives are required, the first stage will address landscape-level geomorphological and hydrological regimes, and will design a hydro-met system of climate profilers, tide gauges, wave rider buoys and water quality monitoring. It will develop a strategy for establishment and operation of hydro-met and local weather forecasting systems, and will analyze the interconnected estuarine system, specifically addressing the issues of bathymetry, salinity intrusion and conservation needs of the freshwater resources.

In FY16, the work plan includes: (i) preparation of the draft plan for establishing harmonious coastal and near-shore hydro-met systems considering the geomorphological characteristics in the Sundarbans Landscape, stakeholder discussions to agree on the plan; (ii) providing inputs to the proposed India National Hydrology project and the proposed Bangladesh Hydro-met project; and (iii) initiating a study of progression of salinity intrusion from estuaries and rivers to groundwater and consequently to soil surface, the resultant economic cost, with an aim to recommend potential mitigation or management measures that could be adopted in the Sundarbans Landscape.

Activity 2.2 – Targeted Environmental Studies (Total US\$0.8M, FY16 US\$0.3M)

This activity will support initial confidence building tasks to build momentum for the Sundarbans Joint Platform. Various technical studies are envisaged, not as stand-alone studies, but closely linked to dialogue processes and capacity building. Initial studies will respond to demand from a wide group of stakeholders. The scope of similar activities in the later years will be determined as per demands from the Joint Platform and thematic institutional networks once these are operational. In FY16, the work plan will include: (i) delivery of three analytical reports on implications of climate change on the livelihoods of the poor and lists of targeted interventions to cope with the poverty traps climate change may create to assist formulation of livelihood improvement plans and projects; and (ii) preparation of two geo-coded databases, and three analytical reports on flora and fauna at risk in a changing climate to enhance the knowledge base for formulating forestry and biodiversity management plans, investments, and/or interventions.

Regional Cross-Cutting Focus Area

Objective: To build knowledge and capacity across the region in support of transboundary basin dialogue and cooperation.

Focus Area Theory of Change

The Regional Focus Area targets: (i) improving the quality and accessibility of regional water resources data sets and building water resources knowledge, (ii) undertaking capacity building for shared water resources management and cooperation, and (iii) supporting broad-based regional dialogue focused on the SAWI basins to enhance cooperation and management of transboundary water resources.

While this Focus Area will pursue knowledge activities, important aspects of what was originally envisaged under Pillar 1 (e.g., program website and mapping portal) are being implemented under a “Global Programs” code, and have been described earlier in this implementation plan. Pillar 3 below was not in the approved Focus Area strategy as the flood forecasting work was originally proposed for the Ganges Basin. This has been recast as a sub-regional activity that would ideally support work in Bangladesh, Bhutan, India and Nepal. Pillar 4 below is the original Pillar 3; the strategic intent is unchanged but the approach to implementation has changed given formal advice from the Government of India advising they will not engage in the Abu Dhabi Dialogue (ADD), and given the views of ADD members that participation from the other countries was of little value if India officials will not participate.

Pillar 1 – Knowledge Related Activities

Activity 1.1 – Impacts of Climate Risks on Water, Hydropower and Dams (Total US\$0.28M, FY16 US\$0.18M)

This activity provides support to three sub-activities of a programmatic approach: (i) a study to develop assessment tools to rapidly assess the impacts of climate change on sediment yield and how to manage sediment in existing and proposed water resource infrastructure, including hydropower and water supply projects with the objective of maximizing infrastructure sustainability has been completed and a decision meeting is planned for September 2015; (ii) preparation of technical guidance notes to stakeholders and making recommendation on how to ensure that proper sediment management techniques (including development of RESCON2 model) are implemented in projects has been completed and a decision meeting is planned for September 2015; and (iii) development of a regional sediment database and mapping that can be used in the planning of reservoir sediment management for existing and future projects. The activity is well advanced and will be completed in FY16.

Activity 1.2 – Snow/Glacier Contributions to Streamflow & Climate Change Impacts (Total US\$0.15M, FY16 US\$0.1M)

This activity is the fourth sub-activity of the programmatic approach referred to under Activity 1.1 and is developing quantitative estimates of the contributions of monsoon, snow, ice, and glaciers to the river flows in selected river basins of South Asia and assessing how these change under climate change scenarios. The work is largely complete and will be finalized and disseminated in FY16.

Activity 1.3 – Climate Change in Water Resources Management (Total US\$0.6M, FY16 US\$0.6M)

This activity was approved in FY15 but was not implemented. It has now been moved the Water Global Practice to be implemented in two phases – this Bank-executed activity, is phase 1 and will be completed in FY16. A follow-on recipient-executed phase 2 is anticipated for FY17.

The objective is to build knowledge, tools and capacity across the region to assist governments in adapting to the emerging climate change challenges in the water sector. Envisaged support includes development of effective policy frameworks and practical planning, development and management actions that



highlight and address the need for adaptation. In FY16, two parallel reviews will be conducted: (i) of the existing water and climate policy, legal and planning frameworks in each SAWI country; and (ii) of the current knowledge and information on climate change issues, impacts and modelling work. This will include recent and ongoing climate change analytical work, initiatives and projects to develop a comprehensive understanding of climate change impacts and risks on water resources, their implications for current and future water resources planning, design and operations. The activity will also develop terms of reference for an anticipated 12-18 month phase 2 activity to develop an adaptation framework for water resources planning, development and management in South Asia. This would be prepared in partnership with agencies, governments, civil society, research institutions and the private sector.

Activity 1.4 – Small Grants Program – Himalayan University Consortium (Total US\$1.0M, FY16 US\$0.3M)

The objective of this activity is to expand institutional research collaboration, initiate new knowledge generation, and disseminate new knowledge on the different dimensions and complex dynamics of water resources in the Hindu Kush Himalaya (HKH). The grant objective will be achieved through establishing and implementing a research grants program to enable research institutions in the Himalayan University Consortium (HUC) membership (which comprises 27 universities from the HKH region as full members) to jointly undertake HKH water resources problem-based research projects. The program will aim to strengthen research collaboration and networking among the HUC membership and establish the HUC as a vibrant and active South-South forum of knowledge generation and sharing, mountain curricula development, and capacity building among regional members, who will be able to leverage HUC participation and resultant benefits to provide water and mountain-related policy and technical advice to their respective governments.

Pillar 2 – Capacity Building Activities

Activity 2.1 – Capacity Building: Water Quality Monitoring and Analysis (Total US\$0.3M, FY16 US\$0.2M)

A major capacity building activity was approved in FY15. Implementation has occurred via a number of discrete activities with separate grants. This activity is working to create awareness and increase the use of modern technologies in water quality monitoring, and techniques for water quality data analysis, use and dissemination. The activity is supporting the use of water information systems by providing training on the use of modern tools for data analysis and visualization, development of knowledge resources to enable countries to consider real time water quality monitoring in the South Asian context, provision of technical assistance to government agencies for the design and implementation of real time water quality monitoring networks, and supporting study tours by government officials to facilitate regional knowledge sharing on real world application of modern technologies and tools for real time water quality monitoring, analysis and dissemination of information. Work in FY16 will build on the solid foundation laid in FY15, using the same consultants.

Activity 2.2 – Capacity Building – Transboundary Water Governance (Total US\$0.35 M, FY16 US\$0.1M)

The region sees a low level of transboundary cooperation at the basin level. Experience in other regions demonstrates that the lack of cooperation happens often not from political unwillingness, but rather from a lack of capacity, and therefore hesitance, to engage with potentially more skilled neighboring countries in the complex negotiations and coordination process on transboundary waters resources management. This activity will: (i) support activities responding to official SAWI client requests for topical, structured and ad-hoc trainings on various aspects of transboundary waters governance and hydro-diplomacy; (ii) prepare a structured curriculum for institutionalizing training in these subject areas; and (iii) facilitate and support water officials and technical staff from the SAWI countries to receive training at renowned institutions inside and outside the region. The sub-activity will support the participation costs of training participants and instructors. The structured and ad-hoc trainings may include seminars, workshops and study tours on transboundary governance and hydro-diplomacy topics such as: effective negotiation; identifying and

communicating the benefits of cooperation; international water law; establishing transboundary waters agreements; water governance in the face of climate change; stakeholder engagement; and hydro-diplomacy. Study tours will expose officials, technical staff and students to international best practices and innovative approaches to transboundary waters governance and hydro-diplomacy, which can be adopted for effective implementation in the South Asia context.

Activity 2.3 – Capacity Building – Transboundary Water Governance (RE) (Total US\$0.5M, FY16 US\$0.2M)

This grant will support the design of short training modules and curriculum in water diplomacy and basin governance – for uptake by participating universities and other institutions for long-term teaching of the topics. Firstly, a project advisory group will be constituted, consisting of representatives from India, Bangladesh, Pakistan, Nepal, Bhutan, IUCN, the World Bank and academic institutions, to oversee curriculum development. The short training modules will then be authored and finalized for pilot testing. Focus institutions will be identified in India and Bangladesh to run the modules. The modules will then be piloted through the focus institutions and piloted at a regional workshop with participation from other countries in the region. The modules will finally be fine-tuned based on inputs received during the national and regional level workshops and through consultations with experts and institutions stationed in South Asia. At the closing of the grant, the modules/curriculum will be ready for rollout and institutionalization across the region (into government training agencies and academic programs in universities).

Activity 2.4 – Capacity Building – Basin Planning and IWRM (Total US\$1.0M, FY15 US\$0.5M)

In spite of increasing awareness in South Asia of the concepts of integrated water resources management and the importance of a basin-scale approach to development of water resources both within and across countries, there has to-date, been limited practical progress on implementation. A significant barrier to implementation is a lack of professional and institutional capacity. This activity was separated from other activities under Pillar 2 in FY16. It will complement the above activities by supporting study tours, knowledge sharing and training sessions, developing multi-media hydrological training modules for wider use in the region, and developing good practice notes and technical guidance materials for priority areas of IWRM including: (i) groundwater management and modelling, (ii) hydrological information systems and monitoring, (iii) environmental flow assessments, and (iv) flood forecasting and management.

Pillar 3 – Regional Flood Forecasting

Activity 3.1 – Improving Flood Forecasting in South Asia (Total US\$0.50M, FY15 US\$0.35M)

This activity, which commenced in FY15, is contributing to flood forecasting across the greater Ganges-Brahmaputra system and undertaking significant analytical work on a basin-scale flood risk assessment for the GRB. Both sub-activities are progressing well and are scheduled for completion in FY16.

The work is using advances in remote sensing technologies through Google Earth imagery showing the location of the satellite radar altimeter. It is an innovative approach to overcome in situ river stage data limitations and can provide estimates of river water heights during flood period to compute inundation depths and extents, offering many advantages over the traditional gauge station stage height information used in the country. This innovation is planned to operationalize satellite altimetry in the Ganges and Brahmaputra basins to measure upstream river stage to forecast the onset of flood waves downstream ahead of flood time.

The Flood Risk atlas will assist decision makers, policy planners, researchers and risk managers. It will provide quantitative and scientific outputs to inform decision makers engaged in flood risk management practices and policies, disaster risk reduction and risk transfer mechanism. It will portray the spatial characteristics of flood risks in Ganges - the extent of the hazard, the exposure and its vulnerability to the



hazard, and the probable losses for various return period scenarios. Demonstration and dissemination of these activities is planned for FY16 for scaling up under the World Bank-financed National Hydrology project.

Pillar 4 – Dialogue Processes

Activity 4.1 – Regional Dialogue (Total US\$0.5M, FY16 US\$0.15M)

Regional scale dialogue will be supported a diverse range of engagements in order to engage a broader set of stakeholders while maintaining engagement with past dialogue participants. Given strong government sensitivities, the Abu Dhabi Dialogue brand has been dropped. Regional dialogue events will be convened on common water management challenges, emphasizing the basin approach. SAWI will continue to work with the World Bank-facilitated Champions Group on regional integration to connect dialogue on water management and basin planning to related issues of climate change, energy security and inland navigation. Building on the successful Food-Energy-Water Nexus dialogue event of FY15, a regional event focused on nexus issues in groundwater management is being scoped for FY16.



Unaudited Trust Fund Financial Report

(Expressed in US Dollars)	07/01/2014 to 06/30/2015	12/05/2012 (Date of Inception) to 06/30/2015
Receipts (Note 1)		
Cash Contributions	7,747,668	19,051,499
Investment Income (Note 2)	48,794	82,527
Transfers within Hierarchy	2,859,711	2,859,711
Contributions via Transfers	(2,859,711)	(2,859,711)
Other Receipts	4,389	4,389
Total Receipts	7,800,852	19,138,416
Disbursements (Note 3)		
Project Disbursements		
Direct Costs Disbursed by WBG		
Staff costs (including benefits)	(677,558)	(1,278,585)
Consultant fees	(1,201,634)	(1,698,461)
Travel expenses	(416,024)	(830,142)
Airfare rebate	0	2,011
Media workshop	(174,279)	(236,558)
Contractual services	(38,740)	(53,468)
Other direct costs	(5,666)	(7,208)
Total Direct Costs Disbursed by WBG	(2,513,904)	(4,102,412)
Total Project Disbursements	(2,513,904)	(4,102,412)
Non-Project Disbursements	(219,998)	(1,071,289)
Administrative fees and expenses (Note 4)	(219,998)	(1,071,289)
Total Non-Project Disbursements		
Total Disbursements	(2,733,902)	(5,173,702)
Excess of receipts over disbursements / (Disbursements over-receipts)	5,066,949	13,964,714

Fund Balance		
Beginning of period	8,897,764	0
End of period	13,964,714	13,964,714
Fund balance consist of		
Shared in pool cash and investments		13,964,714
Undisbursed Commitments as of X (Note 5)		13,057,198

Status	Beneficiary	YPU/Div	TF Hierarchy	TTL Name
Active	South Asia	SARVP	Trustee Account	Ms. Nicolette L Bowyer-Walker

Contribution Details by Donor

Donor	Currency	07/01/2014 to 06/30/2015	12/05/2012 (Date of Inception) to 06/30/2015
Department of Foreign Affairs and Trade	AUD	0	8,000,000
Department of Foreign Affairs and Trade	USD	3,725,568	3,725,568
Norway – Ministry of Foreign Affairs	NOK	0	18,000,000
United Kingdom – Department for International Development (DFID)	GBP	0	11,500,000

Contribution Paid-in Details by Donor

Donor	Currency	07/01/2014 to 06/30/2015	12/05/2012 (Date of Inception) to 06/30/2015	12/05/2012 (Date of Inception) to 06/30/2015 in USD Equivalent
Department of Foreign Affairs and Trade (formerly known as AUSAID)	AUD	3,000,000	8,000,000	7,233,999
Department of Foreign Affairs and Trade	USD	3,725,568	3,725,568	3,725,568
Norway – Ministry of Foreign Affairs	NOK	0	6,000,000	971,581
United Kingdom – Department for International Development (DFID)	GBP	1,000,000	4,500,000	7,120,350