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**PROGRAM NAME: SUSTAINABLE, JUST AND  
PRODUCTIVE WATER RESOURCES DEVELOPMENT IN  
WESTERN NEPAL (DIGO JAL BIKAS)**

**Annual Report - MAIN REPORT**  
Reporting Period – 1 April, 2016 to 31 March, 2017

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# ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AEC/KU	Aquatic Ecology Center, Kathmandu University
AOC	Area of Change
AWP	Annual Work Plan
CIMMYT	International Maize and Wheat Improvement Center
DDC	District Development Committee
DEM	Digital Elevation Model
DHM	Department of Hydrology and Meteorology
DJB	Digo Jal Bikas
DoI	Department of Irrigation
DOLIDAR	Department of Local Infrastructure Development and Agriculture Roads
DSCO	District Soil Conservation Office
DWIDP	Department of Water-Induced Disaster Prevention
EF	Environmental Flows
ES	Ecosystem Services
FEDWASUM	Federation of Drinking Water and Sanitation User Group
FGD	Focal Group Discussion
GAMS	General Algebraic Modeling System
GDA	Global Development Alliance
GESI	Gender Equity and Social Inclusion
GoN	Government of Nepal
INGO	International Non-Governmental Organization
IWMI	International Water Management Institute
KAP	Knowledge, Attitude and Practice
M&E	Monitoring and Evaluation
Mol	Ministry of Irrigation
MOSTE	Ministry of Science, Technology and Environment

NGO	Non-Governmental Organization
NWCF	Nepal Water Conservation Foundation
PANI	Program for Natural Aquatic Resources Improvement
RVWRMP	Rural Village Water Resources Management Project
SDGs	Sustainable Development Goals
USAID	United States Agency for International Development
VDC	Village Development Committee
WECS	Water and Energy Commission Secretariat
WP	Work Package

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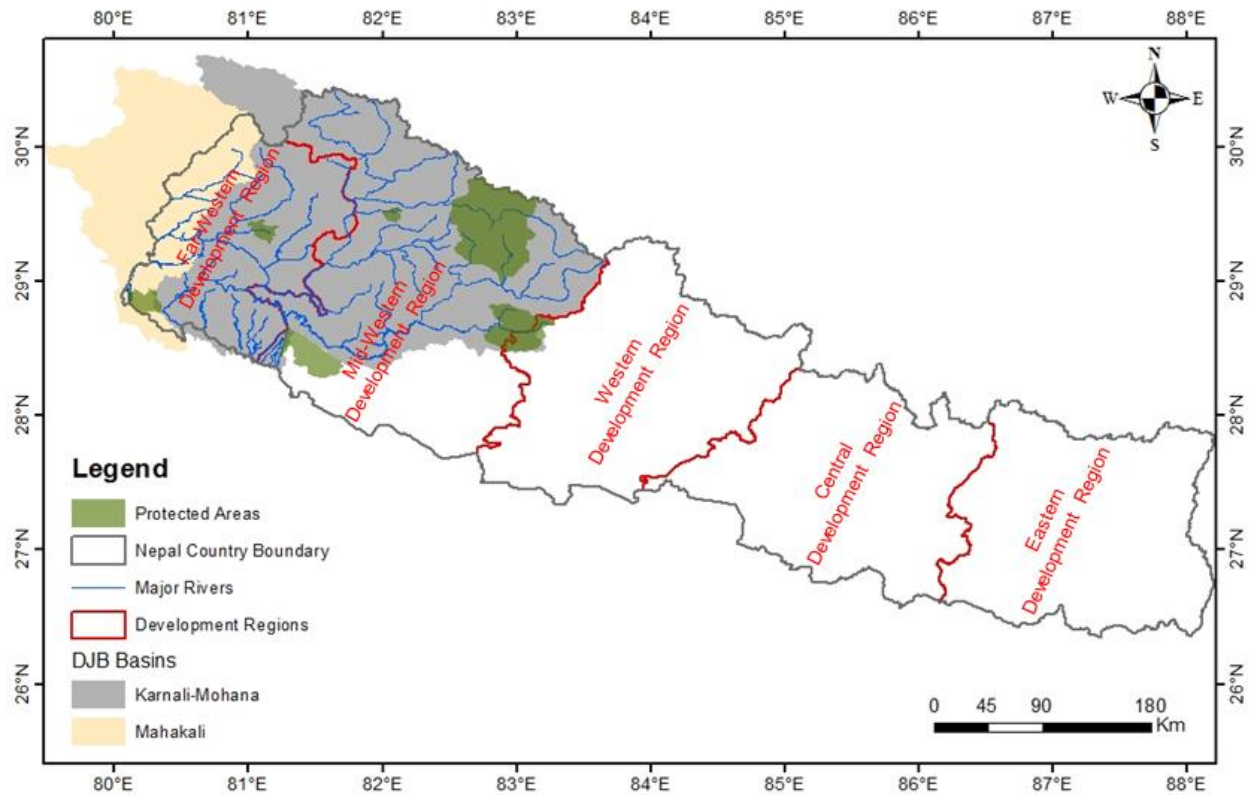


## I. PROGRAM OVERVIEW/SUMMARY

<b>Program Name:</b>	Sustainable, just and productive water resources development in Western Nepal (“Digo Jal Bikas”)
<b>Activity Start Date and End Date:</b>	1 April 2016 – 31 March 2019
<b>Name of Prime Implementing Partner:</b>	International Water Management Institute (IWMI)
<b>[Contract/Agreement] Number:</b>	AID -367-IO-16-00002
<b>Name of Subcontractors/Sub-awardees:</b>	Duke University Kathmandu University Nepal Water Conservation Foundation (NWCF)
<b>Major Counterpart Organizations</b>	Department of Irrigation(Dol) Water and Energy Commission Secretariat (WECS) National Planning Commission (NPC)
<b>Geographic Coverage (landscape, province(s) and countries)</b>	Karnali, Mahakali and Mohana Sub-basins
<b>Reporting Period:</b>	1 April 2016 – 31 March 2017

The overall goal of the “Sustainable, just and productive water resources development in Western Nepal” (hereafter, Digo Jal Bikas or DJB) project, led by the International Water Management Institute (IWMI), is to promote sustainable water resources development in Western Nepal through balancing economic growth, social justice and healthy, resilient ecosystems. The project contributes directly to IR2.3 of the USAID Nepal Country Development Cooperation Strategy (2014-18), focusing on means to increasing the resilience of targeted natural resources and consequently improving the livelihoods on which they depend.

The geographic focus of this project will be the watershed basins and sub-basins within the Mid-western and Far-western Development Regions of Nepal, with a particular focus on the Karnali River Basin, including the Mohana sub-basin in the Terai, and the Mahakali River Basin (See Fig.1).



**Figure 1.** The study region - Karnali and Mahakali river basins. The Mohana sub-basin is part of the Karnali River Basin.

Three objectives are proposed to achieve this goal:

1. The construction of a sound knowledge base on the current state and use of ecosystems and their services and the impact of climate change as well as other drivers of future change in west Nepal to identify key information and knowledge gaps. This includes a comprehensive database on the study area’s natural characteristics including the river and lake network and their connectivity, groundwater aquifers, wetlands, biodiversity and protected areas, their ecosystem services, as well as all water-related physical infrastructure and modifications. This objective will help establish key knowledge and information gaps and provide datasets that will be useable for future and diverse analyses and planning purposes.



2. The development and application of tools, models and approaches (including opportunities and risks) for sustainable water resources development under current state and future scenarios at the basin and local community scale. In particular, tools will be developed to identify the water flows necessary to maintain the integrity of ecosystems and their services. This information will then be used for hydro-economical modelling at basin scale to explore water allocation under future scenarios, including climate scenarios, of different water resources development options and the resulting trade-offs. At sub-basin, watershed and local community scale approaches for improved water management and water governance will be explored.
  
3. Support the development of integrated policy and management guidelines on options and technologies for sustainable water infrastructure development for government and local communities. These guidelines will be designed to promote best practice in water-related infrastructure development (e.g. hydropower, irrigation, managed aquifer recharge, water storage) at different scales, which supports local communities and protects the resilience of ecosystems and their services. The aforementioned knowledge base, tools, models and approaches will underpin these guidelines, which will be developed with input from government and community stakeholders, as well as donors and investors. The policy and practice guidelines will be formulated in collaboration with the PANI program.

To address the project objectives, and guided by the above research questions, six core Work Packages (WP) and two supporting WPs have been developed (Table 1)

**Table 1. Work packages (WPs).**

<b>Core work packages</b>	
WP1	Basin characterization
WP2	Environmental flow assessment and tool development
WP3	Basin-scale development scenarios
WP4	Watershed/village water governance and management
WP5	Gender
WP6	Integrated policy and practice guidelines
<b>Supporting work packages</b>	
WP7	Knowledge management and dissemination
WP8	Project management

The following stakeholders are envisioned as important groups to engage with during this project. They represent both next and end users of the project's products, tools and knowledge.

- Public and private sector agencies and multilateral investors who evaluate, design and implement water resources development projects and investment programs
- National and district level water and energy management agencies, e.g. Ministry/Department of irrigation, Ministry/Department of agriculture, dam/barrage operation agencies, Ministry of Energy, Ministry of Forests and Soil Conservation, Water and Energy Commission Secretariat and the Department of Soil Conservation and Watershed Management Ministry of Science Technology and Environment (MOSTE), Ministry of Federal Affairs and Local Development and Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR), Department of Water Induced Disasters and Prevention (DWIDP), District Development Committees (DDCs) and Village Development Committees (VDCs).
- Conservation groups that want to establish environmentally sustainable water resources planning and management.
- Women and men in farmer and fisher communities that will be affected by climate change and water management decisions in the basin.

## 1.1 Summary of Results for Selected Performance Indicators

A Knowledge, Attitude and Practice (KAP) survey was carried out between December 2016 and April 2017 with key government, non-governmental, research and private sector partners who DJB is targeting for the uptake of its products and services. The survey provides a baseline of values across a range of behavioral outcomes (C-I) in the table below. The aim will be to have one more round of the survey to ascertain changes in knowledge, attitude, practice and capacity in year 3. The baseline survey is being completed and the outcome baseline data will be populated in May 2017.

Discussions with the Central Bureau of Statistics (CBS) of Nepal are ongoing regarding the use of the experimental economic accounting approach to assess, inter alia, changes in ecosystem health, and on the measurement of Sustainable Development Goal (SDG) -6.5 that pertains to integrated water resource management implementation. These indicators will be populated once the data becomes available.

Code	Selected indicators	How baseline will be established and data sources	Indicative Target over project lifetime
A1	Changes in Ecosystems Health	UN-SC SESA Experimental Environmental-Economic Accounting drawing on National statistics (Nepal Central Bureau of Statistics) baseline from Compendium of Environmental Statistics (2015).	Positive change in ecosystems health the measure of effective IWR development
A2	Basin Plans developed by the Government of Nepal address the balance of growth, social justice and healthy, resilient ecosystems	IWMI addresses and reviews content of basin development plans	Evidence of integration of growth, social justice and healthy, resilient ecosystems
B	Status of Integrated Water Resource Management (IWRM) Implementation	<i>SDG Indicator</i> . Bi-Annual questionnaires measuring quantitative and qualitative dimensions.  GoN adopts SDGs and reports annually as obligated under UN convention / agreements.  Baseline to be established in 2017	No unitary target.  Evidence of improvement in IWRM implementation through detailed analysis and report from 2017 baseline, 2019 and 2021
C	Changes in ecosystems knowledge and practice by key stakeholders	Knowledge, Attitude, Practice (KAP) Survey – to be adapted to the context and target groups. Will draw on Areas of Change (AoC) analysis. Baselines to be set in 2017	Targets to be determined through KAP/AoC process including milestones towards improvements in KAP.
D	EFs integrated into water resource planning and development		
E	Governments and other key stakeholders demonstrate knowledge of model strengths and limitations and capacity to apply and interpret models to assess trade-offs at local and basin levels		

G	Number of stakeholders with increased capacity to adapt to the impacts of climate change as a result of USG assistance.		
H	Evidence of gender and equity targeting in key policies, plans and implementation strategies		
I	Number of institutions with improved capacity to address climate change (and more broadly, IWRM) issues as a result of USG assistance		
F	Relevance and effectiveness of pilots to local needs	Baselines of treatment and control / comparison groups for pilots in 2016/17	Definition of success / targets based on degrees of expected change in utilization of technologies / success of the institutional pilot

Progress indicators at the output level have been defined and outlined in the project’s logical framework (see Annex -A). The status of these indicators is reported in the next section of this report.

## 2. ACTIVITY IMPLEMENTATION PROGRESS

### 2.1 Implementation Status

#### Work Package 1. Basin Characterization

Intermediate Result: A sound knowledge base on the current state and use of ecosystems and their services in western Nepal evidentially used by relevant parties

Output	1.1	<b>Basin level database on freshwater ecosystems in W. Nepal, including climate forecasts and water flows, and water availability</b>
Indicator	1.1.1	Database developed and functional
Annual Progress	1.1.1	<p>The following spatial and temporal data has been collected and processed:</p> <ul style="list-style-type: none"> <li>-Digital Elevation Model (DEM)</li> <li>-Soil map, land use/cover map</li> <li>-River discharge network</li> <li>-Climate data</li> <li>-Location and info. of present and future hydropower and irrigation projects</li> <li>-Location and info. of present national parks and protected areas</li> <li>-Administrative boundaries</li> <li>-Basin and sub-basin boundaries</li> </ul> <p>A shared drive has been established and all the data are shared internally through the shared drive designed particularly for this project. A web-based water data portal is in development and once complete, the data from the shared drive will be transferred to the web based data portal.</p> <p>The Soil Water Assessment Tool (SWAT) has been set up for the study basins. The first model runs show good results. The calibration and validation of the model is in progress.</p>
Implementation challenges		There was delay in starting the planned activities due to lack of personnel. Two hydrologists were recruited and commenced activities from November 2016 and Jan. 2017. The activities have picked up since the recruitment of new staff and the activities are now on track.
Stakeholder involvement in delivery		Discussions and interactions with DoI and DHM officials were carried out to collect hydro-meteorological data as well as the location of future irrigation and hydropower projects

*\*Indicator 1.2.2 - Number and type of users of database – will become active once the database has been established and is online*

Output	1.2	<b>Report on comprehensive assessment of the water governance decision-making structure and processes</b>
Indicator	1.2.1	Report comprised of systematic policy clusters and institutional analysis
Annual Progress	1.2.1	<ul style="list-style-type: none"> <li>- Policies and legal documents pertaining to land-water-energy-environment are collected</li> <li>- Policies and legal documents reviewed and analyzed</li> <li>- First round of key stakeholder interviews at national level was conducted in February 2017 -</li> </ul> <p>Draft report of systematic policy clusters and institutional analysis is in preparation</p> <ul style="list-style-type: none"> <li>- Draft paper in preparation (Title: The Politics of River Basin Planning and State Transformation Processes in Nepal) to be submitted to a peer reviewed journal by April 30, 2017</li> </ul>
Implementation challenges		We have not encountered any challenges at this stage. Potential opportunities include closer collaboration with WECS on the overall formulation process of national water resources policy and plans and with ADB on the Basin plans
Stakeholder involvement in delivery		Key policy actors and relevant stakeholders have been approached while collecting the policy documents and institutional background papers. The key informant interviews and in-depth, semi-structured interviews with other relevant actors were conducted in February 2017, after finalization of the first round of preliminary policy review and institutional analysis.

Output	1.2	<b>Report on comprehensive assessment of the water governance decision-making structure and processes</b>
Indicator	1.2.2	Identification of potential entry points for policy and institutional change.
Annual Progress	1.2.1	<ul style="list-style-type: none"> <li>-Key government institutions (e.g. WECS, DoI, among others) and ongoing policy processes (national water resources policy formulation) identified</li> <li>-Key inputs provided to WECS with regard to the draft national water resources policy and in relation to the ongoing of policy consultation processes</li> </ul>
Implementation challenges		We have not encountered any challenges at this stage. Potential opportunities include closer collaboration with WECS on the overall formulation process of national water resources policy and plans and with ADB on the Basin plans.
Stakeholder involvement in delivery		Stakeholders' perceptions and development aspirations were captured during our key stakeholders interviews in February 2017.

Output	1.3	<b>Report with policy recommendations for improved basin governance based on political economy analysis, governance and institutional reviews focusing on the intersection of land-water-energy-environment, and incorporating gender issues</b>
Indicator	1.3.1	Report prepared / Inclusiveness of policy recommendations
Annual Progress	1.3.1	Not available at this stage. Activity under 1.3 will start only after activities under 1.2 (e.g. key informant analysis, stakeholders' interviews, focus group discussions) is completed (Feb-May 2017). Activity under 1.3 will include identification of key agents for change but this will be done only when the perception studies start in March-May 2017.
Implementation challenges		Not applicable at this stage.
Stakeholder involvement in delivery		Key policy actors and relevant stakeholders have been approached while collecting the policy documents and institutional background papers, but the key informant interviews and in-depth, semi-structured interviews with other relevant actors will be conducted in first-half of 2017, after the first round of preliminary policy review and institutional analysis have been finalized.

*\*Indicator 1.3.2 – Effectiveness of policy recommendations – will be reviewed once the report has been prepared (1.3.1)*

<b>Additional indicators gathered for annual report</b>	
Linkages	<p>Preliminary findings from policy and institutional analysis need to be linked to modeling work under WP1, as well as case study analysis under WP4, and gender mainstreaming overall.</p> <p>The basin hydrology model will be used to develop the hydro-economic model and the Ecosystem Services (ES) model</p>
Changes and Lessons	<p>Depending on the outcome of the upcoming local election, we might want to revisit our overall policy and institutional analysis.</p> <p>As much of the secondary data on livelihoods and Ecosystem services is sparse, NWCF has been contracted (March 2017) to carry out Focus Group Discussions (FGDs) to help in the design of a basin wide household survey on livelihoods and ecosystem services. The FGDs will take place in May and the larger household survey in July and August, 2017.</p>
Gender	Covered above under linkages.
Sustainability	No information at this stage.

Environmental Compliance	No information at this stage.
Policy and Governance Support	We are working closely with various government agencies to identify their policy and governance needs and provide additional support if applicable.
Local Capacity Development	<p>We sought opportunities to involve master's students in policy review and institutional analysis as part of capacity building but found it a bit difficult to find the suitable candidates.</p> <p>Two peer reviewed papers related to basin hydrology and national policies will be published in 2017.</p> <p>A project inception workshop was carried out October 2016 where the project was introduced and the methods and some preliminary assumptions and results were presented to relevant stakeholders.</p>
Public Private Partnerships or Global Development Alliance (GDA) partnerships and impacts	Information on some planned hydropower projects from the private sector developers has been collected.
Science, Technology and Innovation issues and impacts	The basin hydrology models will be used in the development of the national basin plans.

## Work Package 2. Environmental Flow Assessment and Tool Development

Intermediate Result: Environmental flow (EF) allocations are an integral part of river management, informing future water resource planning and development

Output	<b>2.1</b>	<b>Desktop tool to calculate environmental flows (EF) and biotic index tool in Nepal</b>
Indicator	2.1.1	Desktop tool functional and evidence of use
Annual Progress	2.1.1	<p>-Literature review of global application of EF assessments was carried out. A draft review paper on EF (Title: <i>A Global Perspective on the Science and Practice of Environmental Flows: From Theory to Implementation</i>) is nearing completion. It will be completed in May after receiving a further input and feedback from co-authors and then it will be submitted to a peer reviewed journal.</p> <p>-The plan for combining ecological information and the IWMI EF calculator based on hydrology has been developed.</p> <p>-Fieldwork to collect data on macroinvertebrates at sites under various levels of disturbance is underway. Until today, ecological sampling was conducted for two seasons: Post monsoon and Base flow. Post monsoon sampling was conducted from 20 November to 3 December 2016 while Base flow sampling was carried out from 17 February to 11 March 2017. For the</p>



	<p>post-monsoon season, 33 sites (12 Natural, 17 abstracted and 4 dam) were selected from the Mahakali Basin, Karnali Basin and Mohana Basins. Over 300 benthic macroinvertebrates samples were collected based on flow diversity and habitat diversity in the sampled river stretch. Additionally, physio-chemical parameters and river habitat were assessed. All the samples are determined and preserved in the Aquatic Ecology Centre, Kathmandu University. For base flow season, sample sites were extended largely to reduce the gap seen between post-monsoon study river catchments in the Karnali River basin. A total of 50 sites were selected for macroinvertebrate samples collection, physio-chemical parameters and habitat assessments from the above mentioned basins. The reference sites were selected from headwater rivers. Among the sampling sites, 24 are natural, 22 are abstracted and 4 are dam sites. Samples are under determination in the Aquatic Ecology Center, KU. Linking of the hydrological and biological data will be carried out once the fieldwork is complete.</p>
<p>Implement- ation challenges</p>	<p>-Challenges might occur while transforming 5 classes obtained from organic pollution based bio assessment protocol into 6 different classes for water abstraction levels as defined in the EF calculator.</p> <p>-Challenges might also occur in finding all 6 EF classes in the project areas. Therefore, it is recommended that additional sites should be selected from other river basins of the same eco-regions for which additional year sampling campaigns might have to be planned.</p> <p>THREATS: Working with biological samples is challenging, due to different activities that have to be conducted simultaneously, OPPORTUNITIES: Large number of samples from wider study areas allow to analyze the data in both broad and specific objectives and will provide overall aquatic biodiversity for the region.</p> <p>-3 field technician have been employed for field visits. Similarly, due to a huge amount of benthic macroinvertebrate samples in the lab, processing of samples might take very long and may hinder the work progress and timely deliverables with employment of only one intern. At least two more interns might necessary to be employed for minimum of 3 months in lab.</p>
<p>Stakeholder involvement in delivery</p>	<p>Data collections, lab processing of the samples and analyses are underway. Outputs are not ready at current stage so direct involvement of stakeholder has not been done or least till date.</p> <p>A knowledge sharing workshop on EFs is being planned for August 2017.</p>

*\*Indicator 2.1.2 – Biotic tool functional and evidence of use will become active once activity starts in this area.*

<p>Output</p>	<p><b>2.2 Recommendations for incorporating environmental water allocations into national water resources planning and on institutional arrangements for implementation</b></p>
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Indicator	2.2.1	Report with relevant recommendations
Indicator	2.2.2	Quality of recommendations
Annual Progress		Activities on biological/environmental data are underway. Until today, field visits and samplings were conducted for post monsoon and baseflow seasons for the year 2016/17. Altogether about 800 samples have been collected. More samples will be collected in the year 2017/early 2018.
Implementation challenges		Since, data generation and field visits are underway, it is too early to outline the challenges/risks at the current stage.
Stakeholder involvement in delivery		A knowledge sharing workshop on EFs is being planned for August, 2017.

Output	<b>2.3</b>	<b>Capacity built on environmental water management for key national stakeholders in Nepal, including curriculum development with a targeted university</b>
Indicator	2.3.1	Number of stakeholders with increased capacity to adapt to the impacts of climate change as a result of USG assistance. (USAID GCC Indicator 4.8.2-26)
Indicator	2.3.2	Quality of capacity built
Annual Progress		Field visit and data collection are underway. Bachelor and Master level students were involved in data collection. One Bachelors level intern has been employed to carry out lab. analysis. Two more interns to carry out lab analysis will be hired in May, 2017. Presentations on E-Flows have been made in national fora and conferences
Implementation challenges		Much of the focus has been on field work and development of the E-flows calculator. More emphasis will be put on capacity building on year two. A national E-flows workshop is being planned for August, 2017.
Stakeholder involvement in delivery		Bachelor level students are involved in sampling and analysis.

<b>Additional indicators gathered for annual report</b>	
Linkages	The outcomes will be linked/used for modeling work under WP1. The anticipated outcomes could be of use for mapping of basin scenarios under WP3 and formulation of guidelines for sustainable water management under WP6.

Changes and Lessons	Some sampling sites were dry during the baseflow sampling season (Feb-early March 2017). Additional sampling sites have been added in the second sampling period.
Gender	A section on the relevance of gender on EF assessment has been added to the review paper.
Sustainability	The main purpose of the EFs assessment is to collect data that will quantify water flow requirements in the river to maintain the rivers at ecologically acceptable levels.
Environmental Compliance	Will be relevant in further stages
Policy and Governance Support	Will be relevant in the current stage
Local Capacity Development	-Undergraduate students are involved in ecological sample/data collection which has enhanced field knowledge and familiarized them on aquatic biodiversity
Public Private Partnerships or Global Development Alliance (GDA) partnerships and impacts	Not relevant at the current stage
Science, Technology and Innovation issues and impacts	The EF calculator, which is being developed, presents opportunity for innovation. The calculator will be developed once data collection and analysis has been completed.

### Work Package 3. Basin scale development scenarios

Intermediate Result: Increased and improved knowledge of tradeoffs in water resource development opportunities resulting from the application of hydro-economic models

Output	3.1	<b>Database and user interface for Government and Partners in the form of a water information system</b>
Indicator	3.1.1	Database and user interface is developed
Annual Progress	3.1.1	The Progress toward this milestone: The internal document and data-sharing platform, including calendar and discussion board, were set up and updated to provide a common work space for DJB researchers. The basic structure of an online data interface is in place. The initial baseline database development moved forward, led by WP1. Updates to data template format to match model code (see output 3.3 description) were completed as well as collaboration with other work packages to develop sub-basins and node locations for analysis.

		Next steps: Populating the Water Information System web interface and the hydro-economic model data template with secondary data and primary data collected by project.
Implement- ation challenges		Progress on this output moving forward will depend on data availability, as well as feedback from the stakeholders on priorities. This will inform updates and edits to the hydro-economic model. Additionally, focus group interactions (planned with other work packages to take place in upcoming periods) with stakeholders will help to inform development of our outputs.
Stakeholder involvement in delivery		As current outputs are not in final version, direct stakeholder involvement has mainly been limited to data collection and information gathering. Stakeholder interests expressed during the project launch workshop and pilot fieldwork have informed work to date and will continue to factor into WP3 planning.

Output	<b>3.1</b>	<b>Database and user interface for Government and Partners in the form of a water information system</b>
Indicator	3.1.2	<b>Relevance and quality of interface</b>
Annual Progress	3.1.1	Progress toward this milestone: The internal document and data-sharing platform provides a structure for common work for DJB researchers, thus demonstrating its relevance. The baseline database is relevant for collecting data for the hydro-economic model (see output 3.3 description). Next steps: As these tools are used more fully, their relevance and quality will be more apparent.
Implement- ation challenges		The relevance of the internal document and data-sharing platform depends on its use among DJB researchers. Additionally, the relevance of the baseline data template depends on the ability to acquire data necessary to populate it. With regard to both concerns, we believe progress so far indicates this output will be relevant and necessary for the project moving forward.
Stakeholder involvement in delivery		As current outputs are not in the final version, direct stakeholder involvement has been limited to data and information gathering. Stakeholder interests expressed during project launch workshop and pilot fieldwork have informed work to date and will continue to factor into WP3 planning.

Output	<b>3.2</b>	<b>Hydrology and infrastructure scenario analyses for predicting economic impacts (including distributional) on sectors and households</b>
Indicator	3.2.1	Scenario analysis report prepared
Annual Progress	3.2.2	Progress toward this milestone: completed review of peer reviewed literature relating to basin characteristics and development paths; contributed to interactions with stakeholders

		including 2 visits to the field with other work packages, meetings with USAID and PANI, meetings with ministry officials, the project launch workshop, and input for focus groups and pilot field work (indirect, through work of other work packages) Next steps: planned stakeholder meetings (July/August 2017) and compilation of existing basin development plans
Implementation challenges		Direct stakeholder interactions have been limited to date due to locational constraints. In the next period, WP3 members will be spending time in Nepal to address this challenge. This will also help to facilitate collaboration on stakeholder interactions between work packages.
Stakeholder involvement in delivery		Will need continued input from key stakeholders to inform scenario development. The stakeholder meeting in July/August 2017 will be an opportunity to set up a 'development panel', a subset of the stakeholders with knowledge and a mandate for development planning in the basins, across sectors.

*\*Indicator 3.2.2 – Quality and veracity of scenarios – will only be assessed once the scenarios have been outlined*

Output	<b>3.3</b>	<b>Description of development pathway opportunities, and resulting trade-offs to key stakeholders</b>
Indicator	3.3.1	Options paper prepared
Annual Progress	3.3.1	Progress toward this milestone: Initial version of the core hydro-economic model completed, including all five modules (water, agriculture, energy, municipal/industrial, ecosystem services). The draft working paper outlining the framework of the hydro-economic model has been updated to match the completed GAMS code. Next steps: Continued revisions of model, particularly after initial runs with data collected (see output 3.1).
Implementation challenges		Progress on data collection (see output 3.1) will inform necessary adjustments to the hydro-economic model.
Stakeholder involvement in delivery		Direct stakeholder involvement in this output to date has been limited. Stakeholder input is key in the development scenarios. Although stakeholders are not directly involved in modeling, they will be involved to provide feedback on the model results and adjust scenarios if necessary,.

*\*Indicator 3.3.2 – Quality and veracity of options – will only be assessed once the options have been outlined*

**Additional indicators gathered for annual report**

Linkages	WP3 has assisted and benefited from data collection activities of WP1, participated in the inception workshop and two basin tours to meet with stakeholders along with other work packages, provided feedback and been involved in planning for the field work that took place in January/February 2017. WP3 has been working with other work packages to develop sub-basins and node placement for analysis.
Changes and Lessons	Potential administrative boundary changes must be considered in development of sub-basins and node locations for analysis
Gender	Gender component included in pilot field work; will continue to include in larger basin-survey. Scenarios will include gender disaggregated demographic information, allowing differential impacts to be considered.
Sustainability	The hydro-economic model design incorporates development scenarios intended to promote sustainable development pathways.
Environmental Compliance	The environmental module of the hydro-economic model incorporates environmental services and other environmental components into the optimization problem.
Policy and Governance Support	Communications with relevant government offices have provided data necessary for the hydro-economic model. Such communications will continue to shape the design of the development pathways in the hydro-economic model.
Local Capacity Development	Not applicable at current stage. Will be incorporated through survey and focus group work.
Public Private Partnerships or Global Development Alliance (GDA) partnerships and impacts	Not applicable at current stage.
Science, Technology and Innovation issues and impacts	The hydro-economic model presents opportunity for innovation. This model will be tested and verified once data collection has been completed.

#### **Work Package 4. Watershed / village water governance and management**

Intermediate Result: Local communities in the project study area adopt practical technologies and land/water management approaches that improve water productivity, protect ecosystems and achieve more equitable water governance, which enable them to cope with and adapt to future climatic and socioeconomic pressures.

Output	<b>4.1</b>	<b>Assessment of sustainable water use under current and future conditions at local scale</b>
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Indicator	4.1.1	Report on the biophysical, social and cultural challenges to water access within the study sites
Annual Progress	4.1.1	-Three pilot intervention sites finalized: one in Kailali district and two in Doti district - site selection report is complete -Water resources mapping of the 3 selected pilot intervention sites has been completed. A draft report has been produced and is in further revision -A detailed baseline survey of pilot intervention sites has been completed. Data cleaning and analysis is on-going
Implementation challenges		During field work people showed high expectations about the potential benefits from the project interventions. We were able to manage this challenge by explaining the scope of the intervention to them clearly- that the interventions will be based on resource mapping and will cover only small part of the village and few households. We made clear that the primary focus of the interventions will be marginal and smallholders.  There was delay in certain activities. One research officer has been hired and started in November, 2016. Activities are now on track.
Stakeholder involvement in delivery		Initial meetings were held with district and VDC officials of intervention sites, and they were informed about the nature of potential interventions. A national NGO is engaged in baseline survey. Project team had interactions with INGOs, and district agencies involved in similar type of activities such as DSCO, CIMMYT, RVWRMP and USAID-funded PANI for possible synergies.

*\*Indicator 4.1.2 – Relevance and quality of report findings – will only be assessed once the report has been prepared*

Output	4.2	<b>Recommendations for relevant local and national government agencies to enhance coordinated water resource management planning at the district and village level</b>
Indicator	4.2.1	Report with relevant recommendations
Annual Progress		(1) Three pilot intervention sites finalized: one in Kailali district and two in Doti district - site selection report [need some revision]; Around 10 interviews were conducted with district level agencies, on-going water program (Finnish funded RVWRMP) in Kailali and in Kathmandu (e.g. FEDWASUN).
Implementation challenges		No specific implementation challenges to report. There are risks in the future related to the state formation in Nepal as the district will not be a relevant administrative and political unit.
Stakeholder involvement in delivery		Main stakeholders were met at the district and village level, we collected their views through individual and group interviews.

Output	4.3	<b>Feasibility analyses of local level pilots: new efficient pumping technologies; farmer cooperatives who jointly invest in irrigation equipment; drip and sprinkler systems to reduce water use per season</b>
Indicator	4.3.1	Effectiveness of pilots
Annual Progress		<ul style="list-style-type: none"> <li>- Three pilot intervention sites are finalized: one in Kailali district and two in Doti district - site selection report</li> <li>- A draft report on land tenure and water access</li> <li>- A detailed baseline survey of pilot intervention sites planned, the field work completed, data cleaning and analysis is on-going.</li> <li>-Details of interventions to be finalized after the completion of baseline survey report.</li> </ul>
Implementation challenges		During field work people showed higher expectations about the potential benefits from the project interventions. We were able to manage this challenge by explaining them clearly about the scope of interventions - that the interventions will be based on resource mapping and will cover only small part of the village and few households. We made clear that the primary focus of the interventions will be marginal and smallholders.
Stakeholder involvement in delivery		Initial meetings were held with district and VDC officials of intervention sites, and they were informed about the nature of potential interventions. A national NGO is engaged in baseline survey. Project team had interactions with INGOs and district agencies involved in similar type of activities such as DSCO, CIMMYT, RVWRMP and USAID-funded PANI for possible synergies.

<b>Additional indicators gathered for annual report</b>	
Linkages	The information collected at the local level will be incorporated in the hydro-economic model that is being developed. The aggregated impact of pilot interventions will be assessed.
Changes and Lessons	No major changes observed yet, but the local election and the result may have some effect on planning and implementation of pilot interventions.
Gender	The list of respondents for group discussions in the case study sites are disaggregated by gender - we conducted separate discussions with men and women. The survey in the pilot sites also has several gender disaggregated variables related to asset ownership, decision-making and group membership. Baseline report will provide gender disaggregated findings. In addition, gender mainstreaming and social inclusion will be a key focus while finalizing the interventions.



Sustainability	Interventions not started yet, and the relevant details emerge only after the interventions are rolled out in the pilot sites.
Environmental Compliance	No issues so far.
Policy and Governance Support	We have been communicating with relevant government (e.g. VDC and DDC) and non-governmental agencies, which will provide inputs to finalize the intervention in pilot sites.
Local Capacity Development	Local field assistant will be involved in facilitating the project interventions in pilot sites.
Public Private Partnerships or Global Development Alliance (GDA) partnerships and impacts	Not applicable yet
Science, Technology and Innovation issues and impacts	Since the interventions have not started yet, no issues so far.

### Work Package 5. Gender

Intermediate Result: Greater awareness and capacity of key stakeholders in the water sector to consider and address unequal capabilities to benefit from and influence water resources planning and management across gender, caste, class and ethnicity at local and basin levels.

Output	<b>5.1</b>	<b>An analytical framework to analyze and integrate gender across scales in the water sector</b>
Indicator	5.1.1	Analytical framework produced
Annual Progress	5.1.1	A senior research officer was recruited and started in December 2016. The WP leader has also reviewed the literature on gender mainstreaming initiatives in the irrigation sector and in the hydropower sector in general. A report on the analytical framework has been finalized.
Implementation challenges		It was a challenge to identify suitable candidates for the national researcher position on gender and ultimately had to transform the position into a senior research officer position.
Stakeholder involvement in delivery		No stakeholder was involved for this particular output as it was based on a review of methods and theories, however we will update the framework based on our fieldwork findings, and interviews with farmers, government agencies, INGOs, experts etc.

*\*Indicator 5.1.2 – Relevance and quality of framework – will only be assessed once the framework has been prepared*

Output	5.2	<b>Other WP consider inequalities by gender, caste, ethnicity and class in roles, responsibilities, impacts and trade-offs for women and men in water access and water resource planning and development processes</b>
Indicator	5.2.1	Number of project outputs with clear gender analysis
Annual Progress		<p>The expectations for Year 1 were that we contribute to one WP1 output. WP5 has contributed to 4 outputs of 4 WPs, namely:</p> <ul style="list-style-type: none"> <li>-Conducted gender review of selected policies and joint interviews with WP1 research team of the main stakeholders in the water/energy sectors</li> <li>- Proposed inputs in the paper on EF prepared by WP2</li> <li>-Collected data in every pilot side through sex-disaggregated FGDs and contributed inputs on gender in the survey instrument used by WP4 for the pilot sites and basin-wide surveys, including the valuation instrument developed by Duke University</li> <li>-Contributed inputs on gender for the KAP survey and identified relevant stakeholders for the gender work package in the water/energy sector.</li> </ul>
Implementation challenges		The main challenge so far has been to integrate gender considerations meaningfully in the project - it requires an in-depth understanding of each WP and to collect data beyond gender for the analysis, e.g. understand the broader political economy for WP1, EF for WP2, it will require conducting in-depth fieldwork on livelihood strategies, institutions and access to water for WP4 etc. The risk is to have to limit ourselves to a superficial analysis for each component. In particular covering all three field sites - which are large and diverse communities, relatively spread out will require considerable human resources.
Stakeholder involvement in delivery		We have met 20 stakeholders for our interviews from WP1, from government agencies in the water/energy sector, INGOs, civil society organizations and experts.

Output	5.3	<b>Gender-specific recommendations for sustainable water resource development planning in Nepal under current and future conditions.</b>
Indicator	5.3.1	Quality / relevance of recommendations
Annual Progress		Not available at this stage. Activity under 5.3 will begin later in the project cycle

<b>Additional Indicators gathered for annual report</b>		
Linkages		We have been working closely with WP1, WP2, WP4 and WP7 as specified above under output 5.2

Changes and Lessons	No significant changes in the operating environment have affected WP5 so far.
Gender	Not applicable
Sustainability	The linkages with the biophysical components of the research project are probably the most difficult to establish - it is easier to establish bridges with WP1 and WP4 - but we have nevertheless taken proactive steps towards strong links between gender and environmental sustainability by our inputs to the environmental valuation survey - to ensure that the latter adequately captures the view of women - and to the EF paper.
Environmental Compliance	Not relevant to this WP.
Policy and Governance Support	A dozen of key policy documents in the water/agriculture/energy/environment/gender equality sector were reviewed to assess how they frame and address gender issues.
Local Capacity Development	No activities to report on this for WP5 for year 1 - we are planning activities for year 2 and 3.
Public Private Partnerships or Global Development Alliance (GDA) partnerships and impacts	The WP5 members are members of the USAID GESI group and attend regular quarterly meetings
Science, Technology and Innovation issues and impacts	There have been few publications addressing the links between EF and gender - it is an opportunity to develop relatively novel research here.

### Work Package 6. Integrated Policy and Practice Guidelines

Intermediate Result: Improve the knowledge base to develop integrated policy and management guidelines

Work on this result will begin in 2017.

### Work Package 7. Knowledge management and dissemination

Output	7	KAP Survey, Inception workshop, project flyer, project website development
Indicator	7.1	Completion of identified outputs highlighted above
Annual Progress	71.	Successfully completed the inception workshop and internal project meeting in October 2016

-Website was launched at the inception workshop making all stakeholders aware of the platform

-Project flyer was developed and printed which is being shared by the team to dialogue with stakeholders in various platforms

-Participated and presented in several national conferences and one international conference

-The progress toward this milestone: KAP survey –

The KAP survey covering 32 respondents was initiated in early February 2017 to assess and monitor the key research users' needs at the beginning of the project. The aim of this survey is to cover a range of stakeholders (government-local level institutions, state agencies, private sector, donors, research organizations and INGOs) perspectives on water management related components that cover the project requirements. The survey is aimed at gaining an understanding of the requirements in the region based on available knowledge, access to resources and gaps identified. It is also to understand the perceptions of stakeholders, attitudes and practices that are implemented by them in the region to initiate development outcomes. What role do stakeholders play and how can best they contribute to the planning processes?

The survey also aims at generating information around policy and institutional gaps. The analysis will help WP leaders to develop their outputs accordingly based on the desired information needed for the region. The KAP survey findings will support the outputs that will be generated based on the requirements in the region so that at the end of the project, it is utilized by the end users for planning purposes. The KAP survey will also help us monitor the progress of changes during the course of a two-year project timeframe. The team aims at achieving the following-

- Generating data to assess the changes in ecosystems knowledge and practice by key stakeholders
- How best EF can be integrated into water resource planning and development
- How governments and other key stakeholders demonstrate knowledge of model strengths, limitations and capacity to apply and interpret models to assess trade-offs at local and basin levels

The survey will draw on Areas of Change (AoC) analysis baselines to be set in 2017. This will help us to go back to a few stakeholders to measure what changed occurred, based on the information generated previously through the KAP.

	<p>Key activities completed under KAP Survey-</p> <ol style="list-style-type: none"> <li>1. Questionnaires prepared in consultation with all project work package leaders</li> <li>2. A list of crucial stakeholders was mapped and identified in consultation with the project team</li> <li>3. The survey was piloted tested with a small group within IWMI to test the responses</li> <li>4. A survey monkey was distributed in the month of April to generate information from the list of identified key stakeholders.</li> <li>5. Survey monkey responses have been generated and analysis is being incorporated into the annual report</li> <li>6. A few direct face-to-face interviews have been conducted with government officials to generate their perspectives.</li> </ol>
Implementation challenges	<ul style="list-style-type: none"> <li>-Availability of important government officials for conducting interviews for the KAP Survey</li> <li>-Collection of survey responses needed constant follow ups to be made</li> <li>-We could only generate slightly more than 50% of the survey responses since there was a low response from the private sector</li> <li>-Timing of the survey clashed with public holidays which was a constraint in collecting responses</li> </ul>
Stakeholder involvement in delivery	All categories of stakeholders were consulted – Government ministries (state, local and national), International NGOs, Private sector, National research organizations and universities

Additional indicators gathered for annual report	
Linkages	Collaboration with other work packages in developing knowledge and communications material
Changes and Lessons	Not applicable
Gender	Gender components were included into the KAP survey to ensure the questions were focused around assessing gender equity and perceptions from all stakeholders
Sustainability	Not applicable
Environmental Compliance	Not applicable
Policy and Governance Support	The main purpose of the outputs from this work package are relevant for policy and governance support. The KAP survey will monitor the effectiveness

Local Capacity Development	The KAP survey will monitor the effectiveness
Public Private Partnerships or Global Development Alliance (GDA) partnerships and impacts	Not yet applicable
Science, Technology and Innovation issues and impacts	The knowledge generation from the project will contribute towards furthering the knowledge base of the study basins and support future planning of these basins

### WP8 - Project Management

Output	<b>8.1</b>	<b>Donor reporting</b>
Indicator	8.1.1	Donor reports submitted and approved
Annual Progress	8.1.1	The annual work plans, GESI plan, M&E plan, the semi-annual and annual project reports and financial reports have been submitted to USAID
Implementation challenges		There was delay in submitting some financial reports as we had to wait for information from our headquarters in Sri Lanka
Stakeholder involvement in delivery		Not applicable

Output	<b>4.2</b>	Coordinate and manage project personnel and operations and strengthen partnerships with external partners
Indicator	4.2.1	The project runs smoothly, thus facilitating the outputs and outcomes from WP1 to WP6
Annual Progress		-Hired 4 full time national staff for the project i.e. 1 project coordinator, 1 hydrological modeler, 1 gender expert and 1 researcher-social science -Finalized contracts for 3 partner organizations i.e. Duke University, Kathmandu University, Nepal Water Conservation Foundation (NWCF) -Planned and conducted monthly project meetings -Attended meetings organized by USAID and the PANI team
Implementation challenges		Project staff are spread in 5 countries so coordinating project meetings when everyone can be present has been a challenge

Stakeholder involvement in delivery	Meetings are ongoing with relevant stakeholders
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Additional Indicators gathered for annual report	
Linkages	Coordination of activities between different work packages
Changes and Lessons	Physical meetings in Kathmandu are being planned
Gender	There is gender balance in the project team
Sustainability	Not applicable
Environmental Compliance	Not applicable
Policy and Governance Support	Not applicable
Local Capacity Development	Not applicable
Public Private Partnerships or Global Development Alliance (GDA) partnerships and impacts	Not applicable
Science, Technology and Innovation issues and impacts	Not applicable

## 2.2 M&E Update

The following narrative outlines the progress made in designing and setting up the M&E tools and systems.

The theory of change and logical framework provide the goal, purpose, outcomes and outputs to be achieved under the project. They also provide the initial assumptions that are key to the theory of change of the project. Monitoring will take place through two interrelated processes: (i) formal assessment of progress against indicators and milestones on a semiannual basis under individual work package plans through an online tracker which has been developed and is now live, and (ii) an action-driven approach based on changes to outcomes measured through a combination of

knowledge, attitude and practice (KAP) and Areas of Change (AoC) approaches (see Box 1 for further information).

See previous section of the report on the KAP baseline survey carried out.

### **Box 1. Areas of Change analysis (AoC)**

AoC is an approach based on outcome mapping developed by the BRACED Programme (Building Resilience and Adaptation to Climate Extremes and Disasters, ITAD, 2015) It outlines a core set of processes or causal pathways that link project outputs to outcomes and ultimately to impacts on human well-being. Areas of Change are defined as:

- Changes in knowledge and attitude in relation to the objective of the component, in order to further strengthen policies and practices as appropriate
- Changes in the capacities and skills of national and local government, civil society and private sector to adapt and adopt to the interventions proposed
- Changes in the quality of partnerships to deliver interventions.
- Changes in decision-making processes through inclusive participation, as one key aspect of a resilient and sustainable system.

IWMI is currently applying the AoC approach in several other projects in the region – so lessons from these will be drawn and applied in this project. <sup>1</sup> <http://www.braced.org/resources/ii?id=761757df-7b3f-4cc0-9598-a684c40df788>

### **Output Milestone tracking**

A simple section of the online tracking system will request information on progress against milestones from work package leaders. The project management team, led by the M&E adviser, has designed the system, and worked with the WP leaders to establish a streamlined template. Evidence from the output and outcome tracking (alongside information on evidence behind the assumptions), the gender tracker, risk assessments (including special event audit), and other related projects and components under the activities will feed into a learning and reflection process built into our planning and reporting. This will allow the project to refine its work and also increase the alignment and provide evidence to USAID and other stakeholders to facilitate overall understanding of the theory of change. The overall approach to monitoring and evaluation of this project will, therefore, rest strongly on regular and flexible feedback from stakeholders, and an accumulative learning-based approach.

### **Roles and Responsibilities**

Under the project management unit, the project coordinator, who will work full-time on this project, will allocate 25% of her/his time to monitoring, evaluation and learning (MEL). The coordinator will be supported by two researchers who will each allocated 25-50% of their time to MEL activities. Each of the WP leaders will allocate 10-15% of their time to MEL related activities,



including data collection, analysis, reporting, results-based management, follow-up and learning. The IWMI MEL specialist will establish the systems, train the project management unit staff, and back-stop the project, providing technical inputs on a needs basis, and quality assurance of specific products, including impact evaluations.