



Regional Cost Share and Institutional Mechanisms Case Study

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CAWS Advisory Committee

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Contents

1.0	Background and Objectives.....	1
2.0	Fargo-Moorhead Area Diversion Project Case Study	1
2.1	FM Diversion Project Background.....	2
2.2	Institutional Arrangement and Capabilities	4
2.3	Cost Sharing Framework and Allocations	6
2.4	Existing Funds	7
2.5	Potential New Revenue.....	8
3.0	Case Study Summary.....	9

1.0 Background and Objectives

Designing, funding, and implementing a long-term solution to prevent two-way movement of aquatic invasive species via the Chicago Area Waterway System (CAWS) will involve a wide range of stakeholders and will require partnerships across multiple local and state governmental entities and federal agencies. While this project’s governance and financing arrangements are unique, other large multijurisdictional infrastructure projects can inform potential jurisdictional partnership options. This document describes a case study of one such project, the Fargo-Moorhead Area Diversion Project (FM Diversion), a \$1.8 billion federally sponsored flood risk management project.

This case study is meant to be a springboard for discussion regarding potential future options for multi-jurisdiction cost sharing to implement an aquatic invasive species solution in the CAWS — to help stakeholders learn from the challenges faced by others, clarify the interests of stakeholders in the CAWS with respect to cost-sharing and regional governance structures, frame additional questions, and identify useful next steps, including whether it would be helpful to learn more about other examples.

2.0 Fargo-Moorhead Area Diversion Project Case Study

Cities and public infrastructure in the Fargo-Moorhead (Fargo, North Dakota, and Moorhead, Minnesota) area of southeastern North Dakota and west-central Minnesota have experienced repeated, extensive flood damages for many years with the Red River exceeding flood stage nearly half of the past 110 years. As shown in Figure 1, this area is at the confluence of several rivers and streams including the Red, Sheyenne, and Maple Rivers, among other smaller watercourses. From the confluence of these tributaries, the Red River of the North (Red River) flows north into Canada. Flooding in this region results from a combination of many factors, including impervious soil conditions attributable to deep frost lines, snowmelt and rainfall runoff, ice flows and jams, and resultant out-of-bank and overbank riverine flows.



Figure 1 - Red River and Fargo-Moorhead Location Map

2.1 FM Diversion Project Background

Average annual flood damages in the Fargo-Moorhead area are estimated at nearly \$195 million. With the primary goal of significantly reducing this flood risk from the Red River in the Fargo-Moorhead area, the FM Diversion Project is a 20,000 cubic feet per second (cfs), 36-mile long, 1,500 foot-wide diversion channel with 150,000 acre-feet of upstream staging covering approximately 32,000 acres.

Floodwaters are detained in the staging area and then discharged to the diversion channel and routed around Fargo-Moorhead area. As illustrated in Figure 2, the FM Diversion project contains numerous components, with the two primary elements consisting of the: 1) diversion channel and 2) upstream staging area.

History of Flooding, Controversy, and Cooperation

A long history of flooding, flood fighting, and controversy exists regarding how to resolve the flooding issues along the Red River.

Incremental steps were taken by different entities at different times, eventually leading to the formation of the Fargo-Morehead Diversion Authority in 2013.

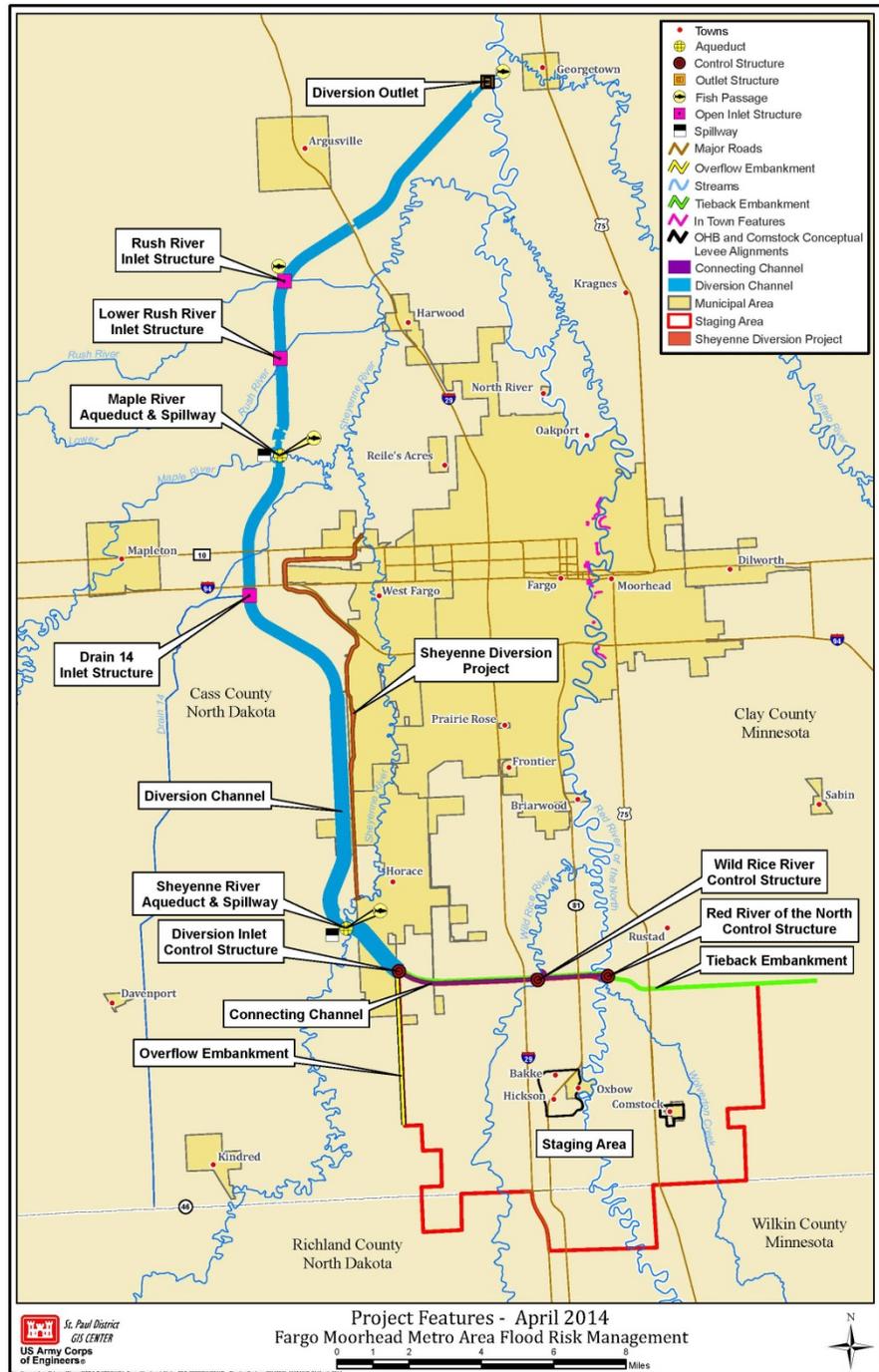


Figure 2 - FM Diversion Project Features

In the early and mid-1900s, efforts generally resulted in various local ditching and levee projects. In the mid-1950s, Minnesota and North Dakota reached agreements regulating the construction of levees. Cities that shared the Red River as a municipal boundary could not build permanent or temporary levees taller than the adjoining city's levees. Cooperation between the States and municipalities began to take hold. Also, in the 1950s, both States established comprehensive watershed management laws that allowed for the formation of water resource districts (North Dakota) and watershed districts (Minnesota). These entities began to take a watershed approach to resolving and addressing drainage and flooding problems in the Red River Basin, at least within their watershed boundaries. This watershed scale approach and governance structure provided the foundation for future collaboration and partnering across jurisdictional boundaries and taking a more holistic approach to solving flood risk issues in the Red River Basin.

With watershed management agencies and the watershed approach still in the early stages, municipalities continued to fend off the nearly annual spring floods common in the Red River Valley. Smaller levee systems and temporary flood-fighting levees were constructed and expanded over time. In the mid 1990s, the water resource boards joined to propose a series of 30 large flood control dams on the main stem tributaries of the Red River. The goal was to modify the timing of the tributaries' hydrographs and reduce peak flooding levels along the main stem of the Red River through careful coordination and use of detained storage. A few projects were constructed, but when widespread implementation of these impoundments was proposed, lawsuits that questioned the environmental impacts of main stem dams and whether a full alternatives analysis had been completed stalled the permitting and environmental review process for the impoundment plan.

Model for Collaboration in the Red River Valley

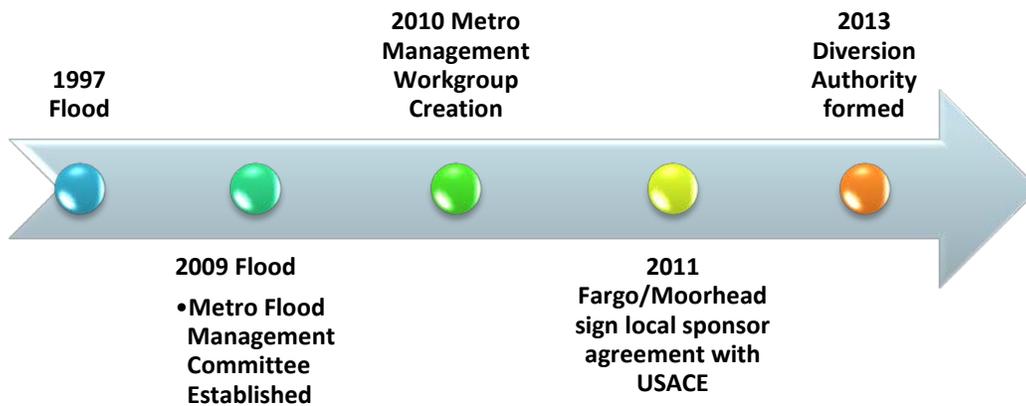
Just as the multiple tributary impoundment projects were being suspended, the 1997 flood occurred. Fargo successfully fought the flood, but a combination of additional precipitation, ice dams, and rapid snowmelt pushed the Red River over the levees and sandbags in the downstream communities of Grand Forks, North Dakota, and East Grand Forks, Minnesota, forcing over 50,000 residents to evacuate overnight. After a rapid feasibility study and environmental impact statement were completed by the U.S. Army Corps of Engineers (USACE), Grand Forks and East Grand Forks joined to become local project sponsors, along with their respective States, to serve as local cooperating partners with USACE for a major flood damage reduction and ecosystem restoration project. The project included restoration of a significant portion of the Red River's floodplain, taller levees, and a major watershed diversion. The Grand Forks/East Grand Forks project created a model for future collaboration in nearby Fargo-Moorhead with regard to both local partnerships and coordination with USACE.

Farther to the north, in Winnipeg, Canada, the 1997 flood, like so many others, did little to no damage. Winnipeg had previously constructed a major diversion channel to route major flood flows around the city and into Lake Winnipeg. After the flood, it became apparent that construction of additional major main stem tributary flood control dams to protect Fargo-Moorhead would not proceed. Furthermore, the successful operation of the existing system in Winnipeg and studies completed for Grand Forks/East Grand Forks had shown that a combination of levees, floodplain restoration, and diversions was the most cost-effective and returned the most benefits in terms of flood risk reduction for urban areas along the Red River.

2.2 Institutional Arrangement and Capabilities

Equipped with knowledge of nearby examples and successes in flood risk reduction from Grand Forks/East Grand Forks and Winnipeg, communities in the Fargo-Moorhead area have formed a collaborative structure developed through several separate organizational actions/groups and also enjoined USACE to develop solutions for local Red River flood risks as illustrated by the timeline in Figure 3.

Figure 3 - Timeline of Diversion Authority Formation



The overall governance structure that ultimately led to the creation of the Diversion Authority for the FM Diversion has aspects in common with the CAWS that may be relevant for future governance decisions. These include:

1. An international boundary water element, which for the FM Diversion Project required the involvement of the International Joint Commission
2. Multi-state, multi-jurisdictional situations involving multiple state, regional, local government, and special purpose entities, which for the FM Diversion Project included:
 - a. North Dakota State Water Commission and Office of State Engineer
 - b. North Dakota Water Resource Districts and Joint Water Resource Boards
 - c. Minnesota Red River Board and Watershed Districts
 - d. Minnesota Department of Natural Resources and Board of Soil and Water Resources
 - e. Individual county and municipal governments
3. Involvement of USACE

Development of the Fargo-Moorhead Diversion Authority

After the 1997 flood, Red River basin flooding in the area was not extensive or extreme until 2009, when near-record flooding once again hit the Red River Valley. Fargo conducted massive flood fighting efforts. As the 2009 flood crests passed Grand Forks and East Grand Forks, the constructed flood control project worked as advertised with little or no remedial flood fighting required. The success of the Grand Forks/East Grand Forks system to the north prompted, cooperation between Fargo, Moorhead, West Fargo, and Dilworth. The cooperation

between communities began in earnest immediately following the 2009 flood with the formation of the Metro Flood Management Committee.

The Metro Flood Management Committee was a self-organized group consisting of elected officials from Fargo, Moorhead, Cass County, and Clay County, along with one appointed watershed official from each side of the river (one from North Dakota and one from Minnesota). Subsequently, the group consolidated and created the Metropolitan Flood Management Work Group with six Minnesota and five North Dakota members. The Metropolitan Flood Management Work Group created a forum for community collaboration but lacked the necessary legal standing to enter into cooperative agreements or implement projects.

Given the involvement of multiple states and local jurisdictions and the anticipated significance of a potential solution, The Metropolitan Flood Management Work Group also engaged USACE in potential strategies for Fargo-Moorhead flood risk reduction. Two members of the Metropolitan Flood Management Work Group, the Cities of Fargo and Moorhead agreed to serve as the local project sponsors on behalf of the Metropolitan Flood Management Work Group in a USACE cost share feasibility study — the FM Metro Flood Risk Management Feasibility Study. The feasibility study was completed in 2011. The Metropolitan Flood Management Work Group worked closely with USACE in developing the 2011 feasibility study. At the conclusion of the study, the preferred diversion location was in North Dakota and included a major flood staging area upstream of Fargo-Moorhead. Members of the Metropolitan Flood Management Work Group voted to support the North Dakota diversion with the upstream staging area.

Members of the Metropolitan Flood Management Work Group represented local governments within the physical footprint of the project and those areas benefited from the project. The following is a general summary of the roles the local governments assumed as part of the Work Group.

- Cities – The Cities of Fargo and Moorhead provided elected official leadership and technical and administrative support to the work group. Primarily, since the City of Fargo has the largest population and greatest benefits, they provided the most support to the effort.
- Counties – represented un-incorporated areas of the project footprint. They also played an important role in addressing local and regional transportation impacts of the project
- Watershed Districts and Water Resource Districts –represented the rural water resource needs and coordinated their local watershed planning efforts with the proposed alternatives.
- States – primarily served in technical support and advisory role during the course of the study.

The study demonstrated that 90 percent of the costs and 90 percent of the benefits would accrue to North Dakota communities. This prompted the Metropolitan Flood Management Work Group to recommend modifying the local governance structure. In 2011, USACE signed a project design agreement with the Cities of Fargo and Moorhead, and in 2013 that agreement was transferred to the newly created Fargo-Moorhead Diversion Board of Authority (Diversion Authority)

The Diversion Authority was formed by the communities of Fargo and Moorhead, along with Cass County (North Dakota), Clay County, (Minnesota), the Cass County Joint Water Resources District, and the Buffalo-Red River Watershed District, who are authorized under Minnesota and North Dakota Law to enter into cooperative governance agreements. These government agencies have signed a joint powers agreement that forms a Flood Diversion Board of Authority (Diversion Authority) as the local project sponsor. The States of Minnesota and North Dakota agreed to split the funding of the local project cost—90 percent North Dakota and 10 percent Minnesota—based on the ratio of economic benefits. The determination of benefits, and those receiving benefits paying a representative portion of the costs, is a long-standing practice in drainage and flood management financing.

Organization of the FM Diversion Authority

The Diversion Authority is currently led by nine board members representing the signatories (several agencies have more than one board member) to the joint power agreement. Its purpose is to build and operate a flood diversion channel along the Red River to reduce flooding risk for stakeholder communities and counties. The Diversion Authority and its members worked with USACE on the FM Metro Flood Risk Management Feasibility Study to develop the flood diversion channel project. The original joint powers agreement (JPA) establishing the Diversion Authority was limited in the sense that it has an end date, with the intent that the agreement would terminate on or before the execution of the Project Partnership Agreement (PPA) between the Diversion Authority (local sponsor) and USACE (federal agency). A permanent JPA is currently under consideration by the Diversion Authority as the PPA is anticipated to be signed in July 2016 to meet USACE’s requirement for utilizing 2016 federal construction funds.

The Diversion Authority has no hired staff. Initially, it relied on administrative and engineering support staff from member communities. As the workload increased, the Diversion Authority hired a private program manager under a year-to-year contract to serve the many staff roles required by project implementation. In addition, a coalition of area consulting firms was retained to provide technical support and design services for the Diversion Authority. To reduce the long-term need for permanent staff to operate the diversion, the Diversion Authority is considering the use of a public-private partnership (P3) model to finish the design, construct, operate, maintain, and finance the diversion for at least an initial 30-year term. The P3 model relies on involvement of USACE and the FM Diversion Authority as the two public partners, with a private concessionaire and its team as the private party.

2.3 Cost Sharing Framework and Allocations

The FM Diversion was authorized by Congress and signed into law by the President in 2014 through passage of the Water Resources Reform and Development Act (WRRDA 2014). According to the 2011 USACE fact sheet, the project has a benefit-to-cost ratio of 1.76 to 1. While this is sufficient for project authorization, it is well known in the civil works industry that the Office of Management and Budget does not recommend projects for new start construction dollars with benefit-to-cost ratios below 2.5. However, WRRDA 2014 also contained authorizing language that allows for authorized projects to be implemented using some form of P3, and it also authorized the concept of using a split delivery model for implementing authorized projects. Both of these concepts play an important part in the progress being made to finance and construct the FM Diversion.

Public-private Partnership and Split Delivery Model

P3 arrangements are an important new tool for financing projects authorized by Congress for construction in WRRDA 2014 legislation. As USACE has explored using P3s for such projects, a potential barrier to their use is that USACE is prohibited from entering into financing or cooperative agreements that obligate future Congresses to monetary commitments. The power of the purse resides with Congress; therefore, USACE cannot directly enter into a P3 concessionaire contract with a long-term financial obligation.

However, WRRDA also authorizes the use of a “split delivery model,” which allows a proposed project to be broken into several units. This model is important for two reasons:

1. It allows USACE to segment the project to reflect those aspects that create the largest benefit-to-cost ratio and to hence increase the federal interests.
2. It allows USACE to present a “multiplying” effect that a dollar of federal investment in turn generates X dollars of local, State, and private financing.

In the past, USACE was prohibited from breaking a project into separable units, and the project had to be considered as a whole. In the case of the FM Diversion, the ability to separate the project into discrete elements allows both to proceed concurrently, unleashing private financing and saving considerable time in the implementation schedule.

In the FM Diversion example, USACE proposes to construct the upstream staging area as a separable element with a benefit-to-cost ratio significantly above 2.0 and an estimated project cost of \$1 billion. This potential investment triggers the complementary and locally constructed and financed diversion channel portion of the project, estimated at approximately \$800 million—several multiples larger than the revised federal cost share portion currently estimated at \$450 million. This arrangement has resulted in USACE recommending to Congress that the diversion be one of six new construction starts for the 2016 fiscal year.

2.4 Existing Funds

Non-federal Local and State Share

Based on the 2011 USACE feasibility report, the total estimated project cost was approximately \$1.8 billion. Prior to the recent P3 and split delivery model arrangements, the cost breakdown was generally outlined as follows:

- \$800 million (45 percent) is the federal share.¹
- The remainder, approximately \$1 billion (55 percent), is the non-federal share. This local, non-federal sponsor cost share typically may consist of a combination of cash; lands, easements, rights-of-way, relocations, and disposal areas (LERRDs); and work-in-kind; however, LERRDs costs are the sole responsibility of the local sponsor.

¹ The USACE national economic development (NED) plan from the 2011 feasibility study was estimated at \$1.2 billion. Federal cost-share provisions provide for 65 percent, or approximately \$800 million, of the NED plan. However, the locally preferred plan (LPP), consisting of the \$1.8 billion FM Diversion, is a deviation from the NED plan. Therefore, applying the same federal cost-share amount of \$800 million to the LPP results in an approximate 45 percent federal cost share.

- Minnesota is estimated to cover 10 percent of the non-federal share (\$100 million).
- North Dakota is estimated to cover 90 percent of the non-federal share (\$900 million).
 - It is being requested that the State of North Dakota and the local stakeholders split the non-federal, non-Minnesota share at 50/50 (\$450 million each).
 - To date, the State of North Dakota has approved \$175 million from State surplus funds.
- The citizens of Fargo and Cass County, North Dakota, have both passed sales tax increases that have been dedicated to help fund the local share. These are expected to raise \$700 million over the life of the tax.

Recent development of the P3 and split delivery model arrangements has suggested modifications to the cost breakdown, in particular, regarding the federal cost-share portion:

- Overall project costs of approximately \$1.8 billion split into two complementary projects:
 - USACE-led upstream staging area, estimated at approximately \$1 billion
 - Locally (P3) led diversion channel, estimated at approximately \$800 million
- Revised federal cost share is \$450 million (45 percent of \$1 billion staging area project) according to a USACE March 2016 fact sheet, which is a reduction of approximately \$350 million from initial arrangements.
- Local, non-federal cost share increased to \$1.35 billion (\$350 million remainder, or 55 percent, of the upstream staging area and all of the \$800 million diversion channel portion):
 - The recent local Fargo and Cass County, North Dakota, sales tax increases have been dedicated to help fund the increased local share and to provide a payback mechanism for upfront capital investments by a P3 concessionaire. Expected to raise \$700 million over the life of the tax, this revenue stream would provide approximately \$250 million more than the original \$450 million allocation for local, non-state stakeholders.

Therefore, in round numbers, the various funding sources of federal, state, and local cost sharing add up to the required funding for the project. Minnesota believes most of its \$100 million has already been provided in in-kind construction services for local flood damage reduction, and the State of North Dakota has committed the one-time \$175 million from a previous State surplus and has set that money aside in a rainy day account. No guarantee in federal funding exists year to year, and the local sales tax by the City of Fargo and Cass County is in place but depends on economic activity to generate the necessary revenue.

2.5 Potential New Revenue

The local North Dakota cost share of the project is approximately \$700 million, to be financed through sale of revenue bonds backed by the local sales tax. However, bonds backed by only sales tax revenue are not viewed as favorably in the bond markets and have added finance and interest costs. Consequently, the FM Diversion Authority has created a special property tax assessment district and has essentially placed the property owners in the assessment district as collateral to back up the sales tax revenue bonds. Should the sales tax not generate sufficient revenue to cover the bond payments, then a property tax could be levied to make up the difference.

The P3 concept and viability involves the desire to expedite construction, reduce the federal cost share, and reduce financing costs. The P3 can provide financing early in the project and can provide design and construction of the local portion of the project, which is the diversion channel, levees, bridges, and aqueducts, among other elements. The FM Diversion Authority then uses sales tax revenue to pay the P3 concessionaire through what are termed “availability payments” for the design, construction, operation, and maintenance of the project over a 30-year financing period (this term or timeframe is often set because of specific project considerations).

It is believed that project construction can be condensed from around 15 years to less than 8 years using this financing and project delivery method. This method is also believed to reduce the cost of financing and interest over traditional capital bond programs. In the case of the FM Diversion, a 30-year operation and maintenance provision is also being proposed. After the end of the contract, the concessionaire will have to return the project in good working order to the FM Diversion Authority. At that point, the FM Diversion Authority could either decide to conduct operations and maintenance using its own forces or continue to contract the services to private operators.

3.0 Case Study Summary

In summary, some key elements of the FM Diversion appear to be driving the project forward to successful implementation:

1. Repeated floods that create a community-based need for flood protection, along with the demonstrated benefits exceeding the cost of implementation
2. Legacy watershed management laws (1950s) in both North Dakota and Minnesota that focus on watershed scale approaches and governance structures and provide the foundation for partnering across jurisdictional boundaries and a holistic approach to flood risk management in the Red River Basin
3. Local sales tax referendum that was overwhelmingly approved to finance the local share of the diversion authority
4. Congress enacting legislation that enables the P3 and split delivery models, which provide local cooperating partners additional flexibility in project financing and delivery
5. A cost share split between Minnesota and North Dakota based on the ratio of benefits afforded to each state by the project
6. Strong political, program, and technical support leveraged from local and national expertise