ASSESSMENT OF THE USE OF GIS BY USAID/NEPAL AND ITS PARTNERS

FINAL REPORT

March 2016

This publication was produced at the request of the United States Agency for International Development. It was prepared independently by CAMRIS International.

ASSESSMENT OF THE USE OF GIS BY USAID/NEPAL AND ITS PARTNERS

FINAL REPORT

March 3, 2016

Contract Number: AID-367-C-15-00001

DISCLAIMER
The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

TABLE OF CONTENTS

Acronyms and Abbreviations 1
Assessment Team Members 2
Executive Summary 1
Introduction 4
Findings 8
Recommendations 11
Annex 1 – People Consulted through Meetings and Interviews 15
Annex 2 – Documents Reviewed 16
Annex 3 – Links to Internet Resources 17
Annex 4 – Examples of Using GIS for Program Planning, Design, and Coordination 18
Annex 5 – Examples of Using GIS for More Effective M&E 21
Annex 6 – Examples of Maps Provided for Review 24

FIGURES

Figure 1: Components of the GIS Environment 6
Figure 2: GIS Spectrum of Possibilities 7
Figure 3: Current GIS Bottleneck 10
Figure 4: Scoping Process for GIS 13
Figure 5: Layering and Data Integration with GIS 18
Figure 6: Example of Spatial Analysis on Access to Hospitals in Timor-Leste 19
Figure 7: Use of GIS Analysis to Answer Spatial Questions 20
Figure 8: Sample of Indicators 21
Figure 9: Sample of Indicators from Hariyo Ban on CAPAs, to June 2015 22
Figure 10: CAPA and LAPA Locations 23

ACRONYMS AND ABBREVIATIONS

AOR	Agreement Officer's Representative
CAPA	Community Adaptation Plan of Action
CMU	Community Management Unit
COP	Chief of Party
COR	Contracting Officer's Representative
DO	Development Objective
ESRI	Environmental Systems Research Institute
GESI	Gender Equity and Social Inclusion
GIS	Geographic Information System
ICIMOD	International Centre for Integrated Mountain Development
IP	Implementing Partner
KM	Knowledge Management
LAPA	Local Adaptation Plan of Action
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation, and Learning
USAID	United States Agency for International Development
USG	United States Government
VDC	Village Development Committee
YI	Youth Initiative

ASSESSMENT TEAM MEMBERS

David Craven, MEL GIS Advisor

EXECUTIVE SUMMARY

EVALUATION PURPOSE

This report presents an assessment of USAID/Nepal's current use of geographic information system (GIS) technology for performance management and decision making. It also examines the potential for expanding the application of GIS tools and techniques to enhance program management, knowledge management (KM), and learning. The assessment included a review of GIS use both within the mission and among USAID/Nepal's implementing partners (IPs).

Objectives

1. Assess USAID/Nepal's collection and use of GIS data for performance management and decision making.
2. Assess potential for developing use of GIS as a tool to enhance KM and learning.
3. Assess use of GIS for project management purposes by IPs.
4. Make recommendations for more effective collection and use of geographic information throughout the USAID Program Cycle.

This GIS assessment is part of a wider review of the mission's KM tools and practices that the Monitoring, Evaluation, and Learning (MEL) project is conducting. Outputs from both assessments will be coordinated to deliver a comprehensive set of findings, conclusions, and recommendations for KM and learning at the mission.

METHODOLOGY

A GIS and mapping specialist conducted this assessment in Kathmandu November 2–18, 2015. His primary source of information was a series of meetings and interviews with key stakeholders representing different departments and sections within USAID/Nepal, five of the mission's IPs, and staff from USAID/Washington. The specialist also reviewed a range of documents, including mission strategy and planning documents, IP performance reports, contracts, newsletters, printed maps, and atlases. He also examined a range of online resources, including USAID social media postings; IP websites; and a range of sites hosted by software developers, research institutions, GIS and mapping organizations, and other technical service providers.

FINDINGS AND CONCLUSIONS

USAID/Nepal has been and continues to be one of USAID's most active and effective users of GIS and geographic information. The examples in **Annex 6** are a small sample of outputs illustrating the broad range of applications the mission has developed and used over the years. Regular appearances of mission-generated maps in USAID publications and on social media outlets give further evidence, as does USAID's track record of helping establish GIS capacity in other missions including Bangladesh, Sri Lanka, and the Philippines. On the strength of its positive experience with GIS, the mission is now looking for opportunities to apply the technology more widely and more effectively to support its own needs.

Even with more than a decade of GIS use, systematic processes for collecting geo-coded data and analyzing it to inform program management decisions are still not consistently implemented throughout the mission's Program Cycle. USAID/Nepal uses GIS and geographic information most effectively in planning, designing, and coordinating programs during the design phase. Less effectively, the mission also uses them for project learning,

performance monitoring, and adaptation during the implementation phase and for evaluating program impact upon completion.

Mission staff generally reported positive experiences in using geographic information in program management, and there is widespread enthusiasm for expanding its use. However, staff's opinions vary greatly as to which applications to develop and how to develop them, and there is no single, clear, documented vision of what GIS capacity the mission wishes to develop. The mission reportedly drafted a GIS strategy years ago; however, it needs to be updated, shared, and implemented.

Key constraints to using GIS more widely and more effectively include:

- In-house expertise is limited to only one GIS specialist;
- Most mission staff demonstrate little experience in "'thinking spatially," limiting the demand for GIS;
- Resources required to properly scope out mapping activities and collect and analyze geo-coded data are generally underestimated; and
- Mission staff and IP staff do not engage with each other adequately to facilitate an effective flow of geographic data and information.

RECOMMENDATIONS

- The mission should define a vision for how it wants to use GIS and geographic information in the future and a strategy for attaining that vision. The strategy and vision should be in the form of a written document to give program managers a common and consistent reference for incorporating GIS requirements into annual work planning and budgeting efforts.

- The mission should continue to build on current efforts to improve the quality of monitoring and evaluation efforts with increased use of spatial analysis and geographic information.

- There is a general need to increase the amount of engagement between the consumers of geographic information (e.g., Contracting Officer's and Agreement Officer's Representatives, staff from the mission's Integrated Monitoring & Evaluation Team, the Program Office, and technical specialists) and the producers of GIS information (mission and IP GIS specialists). Mechanisms for achieving this could include forming and scheduling regular meetings for a mission GIS user group, formalizing the scoping process for GIS analyses and outputs, and allocating more time for staff on both sides to engage in "'invisible" GIS activities, such as scoping and designing mapping projects and working with IPs to define and collect geo-coded performance data.

- If feasible, boost in-house technical capacity by hiring at least one more GIS specialist (a Nepali foreign service national) and designating one internship position for an intern with GIS skills who can be dedicated to GIS activities. Alternatively, the mission may consider contracting GIS support services to augment in-house capacity. All other GIS recommendations seek to make the best use of existing staff resources and can be implemented in conjunction with these recommendations or in lieu of them.

- Oversight of IPs should be strengthened to ensure they meet their contractual obligations for submitting geo-coded data to the mission. This will require more engagement between technical mission and IP staff to make sure the obligations and requirements are fully understood by both parties. It will also require stronger contractual oversight to ensure that IP'-funded GIS positions are filled and focus on managing, analyzing, mapping, and submitting geo-referenced data.

INTRODUCTION

ASSESSMENT PURPOSE

USAID/Nepal has been an active user of geographic information system (GIS) technology for many years. Since 2001, the mission has employed a full-time GIS specialist who regularly engages with other missions and with USAID/Washington on GIS-related matters. The mission has also encouraged its implementing partners (IPs) to use GIS and to report their activities and results geographically.

Because it provides geographic perspectives on key development issues, GIS is valued by the mission for help in planning and designing programs, monitoring their implementation, and communicating their impact.

On the basis of the positive contribution GIS has made to its operations, the mission is now looking for opportunities to use the technology more widely and more effectively. To support this effort, the USAID/Nepal Monitoring, Evaluation, and Learning (MEL) project engaged a GIS specialist to conduct an assessment to provide insight into current use and offer recommendations for future expansion of GIS use by the mission.

The scope of work for the assignment specified the following tasks:

- Assess the use and relevance of GIS and geographic information at USAID/Nepal.
- Assess the extent to which the mission's IPs are already using GIS for project management.
- Identify sources of geo-referenced data in Nepal that the mission may wish to acquire on a regular basis for mapping purposes.
- Present preliminary findings and conclusions to the mission as part of a wider knowledge management (KM) assessment.
- Prepare a draft GIS assessment report examining strengths, weaknesses, opportunities, and recommendations for more effective collection and use of geographic information throughout the USAID Program Cycle.
- Prepare a final GIS assessment report responding to feedback received from USAID.

The GIS specialist, David Craven, completed the first five tasks during the period of November 2–18, 2015. This final report addresses feedback received from USAID/Nepal on February 4, 2016.

METHODOLOGY

The GIS specialist conducted this assessment November 2–18, 2015. Information and data for the assessment was collected through interviews and meetings, a selective review of relevant literature, and internet research. The following describes the main categories of resources consulted, details of which are provided in the Annexes.

Meetings and interviews: These included face-to-face and online meetings with both technical and program management staff from USAID/Nepal (six people), MEL technical staff (four), other IPs in Nepal (seven), and USAID/Washington staff (one). **Annex 1** provides a detailed list of all the professionals consulted.

Document review: This focused primarily on USAID documents, including strategy and planning documents, technical reports, IP performance reports, contracts, and newsletters and bulletins. **Annex 2** elaborates on the documents reviewed.

Internet research: Online resources reviewed included USAID/Washington and USAID/Nepal websites and USAID/Nepal's Facebook page and Twitter feed. Other online sites consulted were AidData, the joint USAID/National Aeronautics and Space Administration (NASA) SERVIR program, the Kathmandu-based International Centre for Integrated Mountain Development (ICIMOD), GIS Day and Environmental Systems Research Institute (ESRI). **Annex 3** highlights URL links to key websites and resources.

Map and GIS output review: The mission GIS specialist and IPs provided a wide range of materials for review. These included printed maps, online maps, atlases and other map collections, data-capture forms, and tables of statistics. **Annex 6** shows examples of the graphics provided.

BACKGROUND

The two concepts presented in this section provide context and will help explain the findings and conclusions that follow. First is a description of the "GIS environment" that offers a broader definition of the term GIS than the information technology-focused definition most frequently used. Second is the "spectrum of possibilities," which shows the range of USAID mission work areas in which GIS and spatial analysis are, or could be, most commonly applied.

The GIS environment: "GIS" is generally defined as "'geographical information systems," but for most purposes today the definition is broader. Instead of using the word '"systems," which suggests a limited computer interface that takes specific kinds of data and generates statistical reports and graphics, it is better to use the word "services," which encompasses the much wider role geographic information plays in our work. At USAID/Nepal, this broad range of services best describes the spatial complexity and non-standard nature of USAID's business. GIS is therefore better seen as an integrated technical environment comprised of the five interrelated components shown in **Figure 1**.[1]

[1] Figure 1 has been adapted from a number of different sources, each showing the same five basic components. For examples see: http://bgis.sanbi.org/GIS-primer/page_12.htm, http://maps.unomaha.edu/workshops/Career/ESRI/comp_gis.html, or http://www.expertsmind.com/questions/geographic-information-system-30132448.aspx.

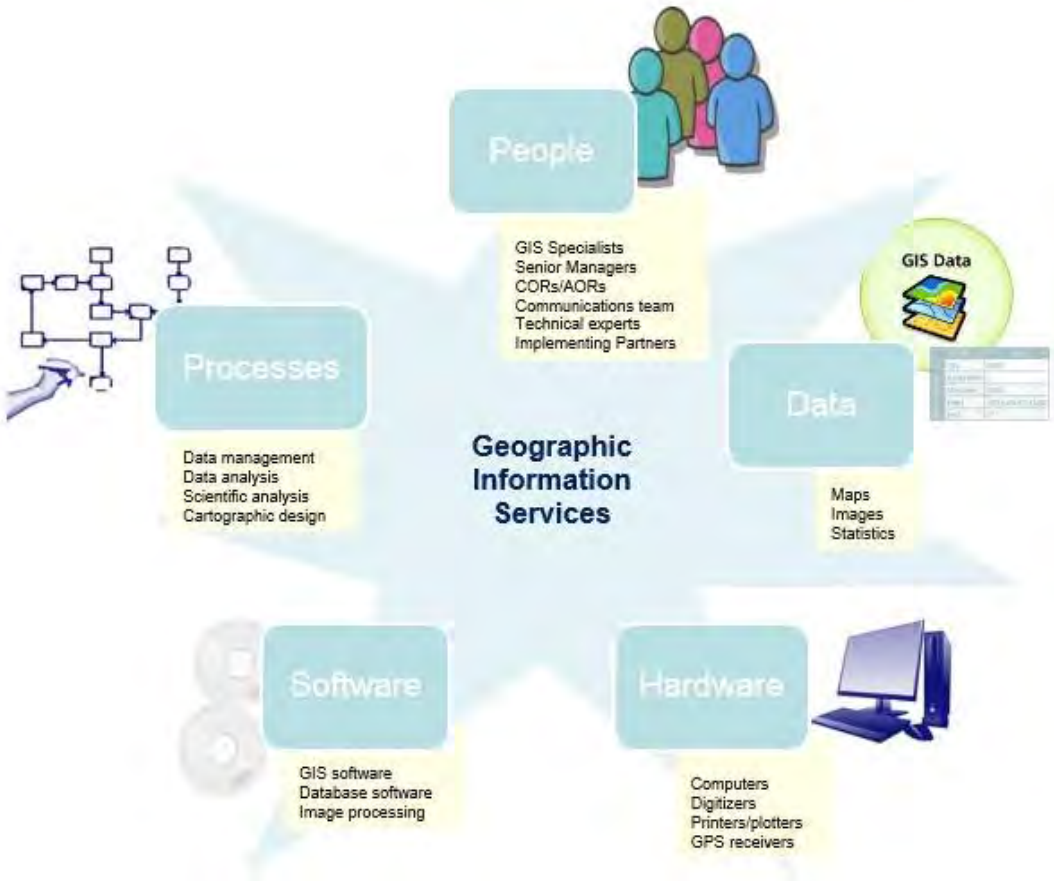


Figure 1: Components of the GIS Environment

When these five components work together effectively, the results can serve a wide range of functions and needs and produce a wide range of outputs and products.

Relevance of GIS to USAID/Nepal: When considering how to apply GIS, it is useful to be aware of the breadth that the field covers. **Figure 2** shows examples of the different areas of USAID mission work in which GIS is or can be most useful—from simple activity mapping at the bottom to detailed scientific research at the top. As a general rule, the more complex and sophisticated the nature of the work, the more expensive and time-consuming it is to apply GIS effectively.

Two categories stand out: scientific activities (above the red line in **Figure 2**) and program management activities (below the red line). Although the mission supports scientific research through its projects and partnerships, most of the mission's direct interest in GIS is focused on the range of program management activities shown below the line. Even within this group, complexity varies considerably. Some activities, such as impact evaluation, are much more demanding of resources than others, such as simple activity mapping.

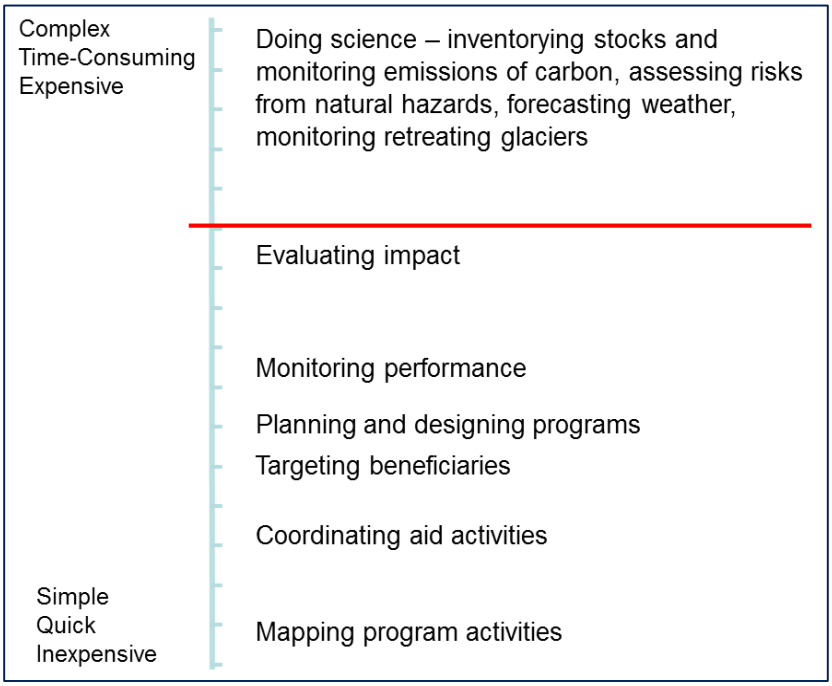


Figure 2: GIS Spectrum of Possibilities

Most of the findings below suggest that, although there is some level of awareness of both the range of GIS applications possible and the GIS environment needed to realize those possibilities, the mission does not appear to have a formal vision or a clear strategy for making its use of GIS more effective and further developing its capacity beyond the current level. The mission requested this assessment as a step toward addressing this gap.

FINDINGS

CURRENT SITUATION

USAID/Nepal has long been—and continues to be—an active user of GIS and has been a leader in the Agency for many years. The examples in **Annex 6** give a sense of the broad range of applications the mission has developed and used. More details are given in publications such as the mission's January 2013 newsletter, which includes an article entitled "Mapping for Better Results," and the latest edition of "USAID/Nepal Project Maps" from April 2015. USAID/Nepal's leadership role within the Agency is evidenced by its function of providing GIS support to other missions providing disaster assistance in Sri Lanka, Pakistan, India, and Burma. Maps from Nepal feature regularly on USAID websites and other social media platforms and in publications such as *Frontlines*.[2] The purpose of this assessment is to support the mission's effort to develop these geographic services to continue providing valuable tools to understand, report, and communicate the mission's work.

According to the mission's GIS specialist, Program Office director, and Regional Science and Technology Advisor, most of USAID/Nepal's GIS work to date has been for program planning, design, and coordination—supporting the bottom four activities on the spectrum in **Figure 2** (activity mapping, coordinating aid and development activities, targeting beneficiaries, and planning and designing programs). There are now clear indications that the mission would like to 1) further develop its use of GIS in program planning, design, and coordination, and 2) extend its use of GIS to promote more effective performance monitoring, project learning, and impact evaluation.

Although it has a long track record, the use of GIS, and more generally of geographic information, is not consistently incorporated throughout the mission's Program Cycle. The most widespread and effective use of geographic information has been and continues to be in strategic planning and program design (see **Annex 4**). To some extent, maps are used for outreach and communication, to show where mission programs are working and what they are doing there. Rarely is geographic information used in performance monitoring, project learning, or impact evaluation.

The mission is making efforts to lend more geographic perspective to its monitoring and evaluation (M&E) efforts. It has a policy in place to collect geo-coded performance data from its IPs, but most IPs currently are not meeting their contractual obligations in this regard. The reasons for this include the following:

- Some IP M&E staff are not aware of contractual obligations to submit geo-coded data. This may occur because they do not have access to the project contract, or they misinterpret it. At least one IP knew they were required to collect geo-coded data, but thought they were required to submit data to the mission only upon request.

- Engagement between mission and IP staff is insufficient, so even when IPs know they are required to submit geo-coded data, they often do not know exactly what kind of data; in which format(s); to what level of detail (district, Village Development Committee [VDC], ward, or site); and for what time period. This occurs, in part, because the diversity of the mission's portfolio—in terms of technical scope, geographic coverage, and project timeframes—presents significant challenges for

[2] See, for example, https://www.usaid.gov/news-information/frontlines/climate-changescience-technology/what-it-means-think-spatially.

standardizing geo-coding requirements. Some customization is required for each project, making the burden of explaining and clarifying the requirements very challenging for the mission's GIS specialist and Agreement Officer's/Contracting Officer's Representatives (AOR/CORs).

- All five IPs consulted during this assessment had at least one funded GIS specialist position, but only three of the five currently have those positions filled.
- Among those IPs that do have GIS capacity, the extent to which GIS-trained staff are allowed to use their skills varies considerably. This depends on what other demands they have on their time and on the technical preferences and priorities of their respective Chief of Party (COP) and direct supervisors.

FUTURE AMBITIONS

Many people in the mission want more and better use of GIS technology and geographic information. Interest and enthusiasm within the mission is high, from Development Objective (DO), M&E, and Program Office staff and from technical specialists. The views of the incoming Mission Director will have a crucial bearing on the direction future GIS development takes.

Among IPs interviewed, M&E staff indicated they would like to do more with GIS and to interact more closely with USAID staff to produce geographic information useful to the mission and project team. Some IPs are actively seeking to fill vacant GIS positions; some are not.

CONSTRAINTS

There does not appear to be a clear, documented, long-term vision of how the mission wants to develop and expand its use of GIS. The options are many and varied, so any expansion will need to be selective. There are many people with many excellent ideas about what could be done, but there is no strategy or process in place to guide and direct what should or will be done.

There is a significant bottleneck by having only one GIS specialist in the mission (**Figure 3**). This situation will deteriorate as the mission expands and systematizes its use of geographic information.

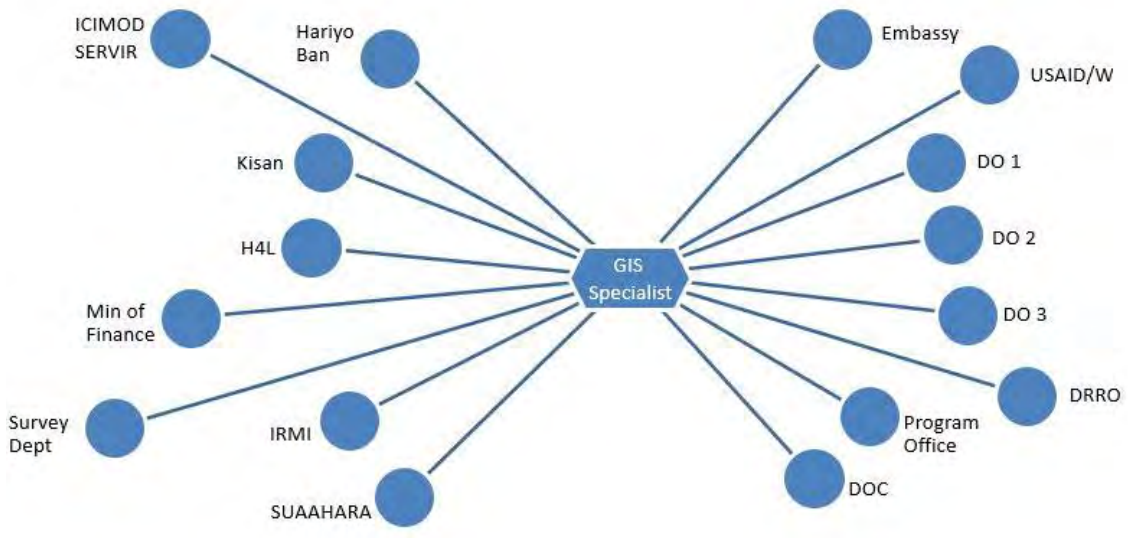


Figure 3: Current GIS Bottleneck

There is not enough “spatial thinking” from potential consumers of geographic information, either among IPs (e.g., COPs, M&E specialists) or at the mission (e.g., AOR/CORs, M&E staff, technical specialists). Most of the interviews conducted for this assessment pointed to this gap—the people involved in planning, coordinating, implementing, and monitoring USAID programs in Nepal are simply not in the habit of working with spatial data and presenting geographic information.

IPs that do not have staff with GIS skills are not able to do effective spatial analysis and geographic reporting. Even if outsourcing GIS services is an option for some project teams, it requires a project member who can clearly envision and articulate how geo-referenced information will be used to engage effectively with the technical specialist involved in generating a map. In addition, IPs that have in-house GIS capacity aren’t necessarily getting as much as they could out of GIS. An important reason for this is that there is insufficient direction from managers and M&E staff at the mission and within projects to use available GIS skills effectively by requesting geo-spatial analysis and maps.

RECOMMENDATIONS

The following recommendations offer a range of options to the mission to improve and expand its use of GIS. Some of these recommendations are for complex, long-term initiatives; some could provide more immediate returns on investment in GIS. The focus of the short-term and medium-term recommendations is on how to institutionalize the use and analysis of geographic information into USAID's standard approach to M&E, which was identified in the findings as a significant gap. It is important to ensure that all planned GIS activities are systematic, intentional, and resourced.

These recommendations use the five components of the GIS environment (**Figure 1**) as a framework.

GIS VISION AND STRATEGIC PLAN

Short term: Define a long-term vision for use of GIS at USAID/Nepal in consultation with mission and IP stakeholders. Develop a strategic plan to execute that vision, with initial focus on building GIS capacity for M&E. Together, the vision and strategy will help maintain the mission's leadership role in GIS use within the Agency and provide a best practice model for other missions. They will also help maintain internal support for GIS in the face of frequent mission staff turnover.

Medium term: Document and disseminate the GIS strategic plan to help institutionalize it. Review and discuss the plan across the mission regularly. For example, highlight the use of GIS at a mission-wide meeting every month, ask staff members to propose new uses, and display maps showing new analyses.

PEOPLE

The recommendations below to expand staff will significantly enhance in-house GIS capacity. If creating new GIS positions is not a feasible option, greater emphasis should be placed on all other GIS recommendations that seek to make the best use of existing staff resources.

Short term: If feasible, boost in-house technical capacity by hiring one more GIS specialists (a foreign service national). This will help the current GIS specialist cope with demand and expand the range and reach of the services he or she is able to offer. It will also provide the overlap needed to pass on vital institutional knowledge that would otherwise be lost when the current specialist retires. Alternatively, consider contracting GIS support services; however, this approach would be less effective in ensuring continuity of institutional knowledge. In parallel, determine where GIS expertise exists (or should exist) within IPs and optimize its use.

Medium term: Start the process to institutionalize senior GIS specialist capacity. The mission's current and only GIS specialist represents a great depth of expertise and institutional memory that can't be easily or quickly replaced. Staff tasked with GIS responsibilities will need mentoring over an extended period (one year minimum). In addition, designate one position each year under the mission's existing internship program for an intern who already has specialist GIS skills and can dedicate his or her time exclusively to GIS activities.

PROCESSES

Short term: Make formal work plans for GIS staff to reduce the current ad hoc nature of activities and allow them to focus on strategic, planned work. This includes allocating time for vital "invisible" GIS activities, for example:

- Program scoping and design (20 percent of specialist's time).
- Map production (20 percent).
- Work on geo-coded performance data with IPs (15 percent).
- Capacity building within the mission (10 percent) and with IPs (10 percent).
- Ad hoc demands (25 percent).

Hold a one- or two-day workshop to introduce staff to the GIS scoping process and help them understand how to apply it in the context of the mission's standard practices. To begin to address a significant gap identified by mission staff, the workshop could focus on M&E applications, using case studies such as the one shown in **Annex 5**.

Organize an annual GIS and mapping expo, possibly as part of the MEL project annual learning summit with mission and IP staff. This event would:

- Showcase what mission and IPs are doing with GIS.
- Facilitate exchange of data and information among all participants.
- Enable mission staff to learn from others.

Medium term: Ask senior managers to require regular, map-based reporting from their staff, with demands such as:

- Every quarter I want a set of maps showing, for example, the locations of activities started during the last quarter, the locations of sites visited by mission/project staff during the last quarter, and the number of new beneficiaries in each district or VDC.

- Every year I want a set of maps showing, for example, actual versus target indicators from our performance management plan (PMP), disaggregated to district or VDC level; levels of project spending during the year by district or VDC; and the locations and current status of selected project or program field activities.

- Every month I want to see new maps appearing on the USAID/Nepal website, Facebook, Twitter, and the USAID Impact blog.

Form GIS user group(s). Such groups could include:

- A USAID/Nepal GIS user group, with members such as a data focal person from each DO, the Development Outreach and Communications Officer, and the Regional Science and Technology Advisor;

- A group bringing mission and IP representatives together; and

- A broader group to include GIS stakeholders in Nepal's development community.

Develop and consistently apply a standard scoping process for every GIS and mapping project. The ultimate goals of the scoping process are to ensure that: 1) the GIS specialist clearly understands exactly what the consumer is asking for (what's wanted); and 2) the consumer clearly understands what the GIS specialist can realistically and reasonably do (what's possible) with the resources of time, money, data, and technical skills and knowledge available.

Whether the output is simple activity mapping, complex monitoring of carbon emissions, or something in between, the process for scoping out how to apply GIS is much the same (**Figure 4**). The process has three elements, and integrating them is key to making it work.

The elements are:

- The consumers are the individuals who will ultimately use the GIS outputs. It is vital that the consumers and the GIS specialists work together very closely.
- The data requirements are determined by the needs of the consumer.
- The technical requirements include the skills of the GIS specialists and, often, inputs from other experts such as soil scientists, demographers, public health specialists, economists, and AOR/CORs.

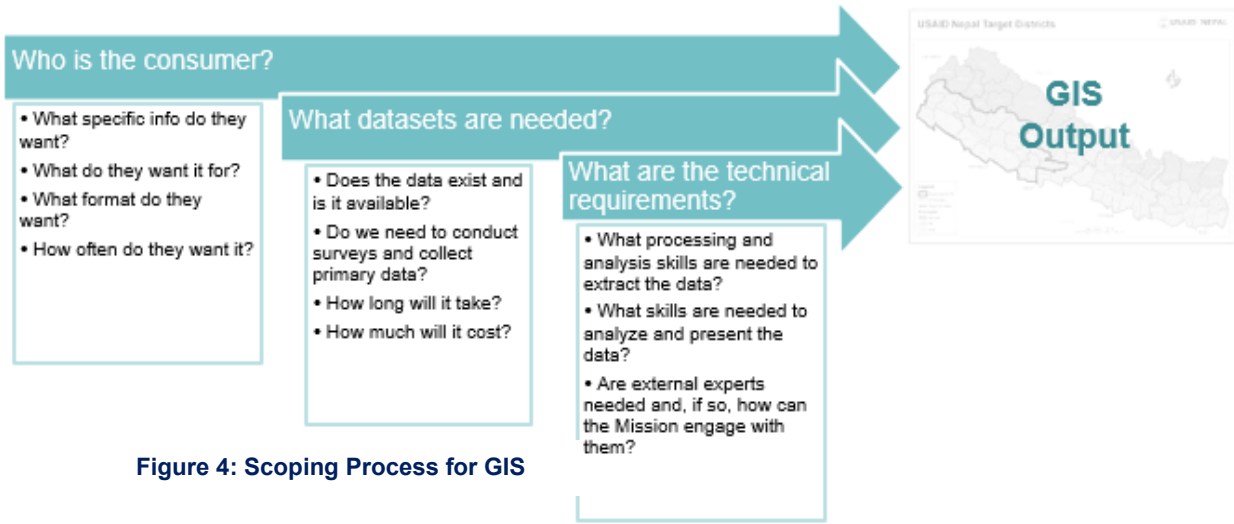


Figure 4: Scoping Process for GIS

This scoping process almost always requires repeated iterations before the consumer ultimately gets what he or she wants. Converting this figure into a GIS Request Form will help operationalize this process.

DATA

Short term: Specify geo-coded data requirements in the mission's PMP—specifically in the Performance Indicator Reference Sheets—in consultation with AOR/CORs and GIS specialist(s) to identify the subset of indicators that are most suitable for mapping.

Engage in stronger oversight by AOR/CORs and mission GIS staff to obtain the geo-coded performance data the mission wants from the IPs.

Build on general staff interest in Google Earth to promote spatial thinking mission-wide by distributing a few key datasets in Google Earth.kml format and training staff how to use them.

Medium term: Establish and maintain a library/archive of existing maps, categorized according to how the maps were used for planning and design, performance monitoring, project learning and adaptation, impact evaluation, and outreach.

Optimize the use of data generated by USAID information management systems such as AIDTracker Plus, Feed the Future Monitoring System, and AidData and by the Government of Nepal's Aid Management Platform.

HARDWARE AND SOFTWARE

Short term: Take advantage of support provided by the Agency's GeoCenter:

- ArcGIS server installation and operationalization
- Technical backstopping from USAID/Washington database administrators
- Advanced geo-spatial analysis
- High-resolution imagery
- Annual conference for USAID GIS specialists.

Medium term: Establish and maintain a GIS lab that meets the mission's needs as documented in the GIS strategic plan. This includes more space for people and equipment (such as staff workstations, computers, printers, plotters, mapping table, mapping supplies, library/archive, and large format map cases).

Build the capacity of selected mission staff in the operation of GIS hardware and software as specified in the GIS strategic plan.

ANNEX 1 – PEOPLE CONSULTED THROUGH MEETINGS AND INTERVIEWS

Bibek Adhikari, Health for Life Project

Carolyn O'Donnell, USAID/Nepal (M&E Fellow)

Ganesh Sharma, MEL Project (Statistics and Data Specialist)

Indra Sharan KC, USAID/Nepal (GIS Specialist)

Jagganath Bista, Health for Life Project

Kristin Ray, USAID/Nepal (Director, Office of Program and Project Development)

Lorene Flaming, MEL Project (Knowledge Management Advisor)

Michael Crino, USAID/Washington (Deputy Director, GeoCenter)

Murari Adhikari, USAID/Nepal (COR, MEL Project)

Nim Bahadur Thapa Regami, Sajhedari Project (Senior GIS Officer)

Prakash Gnyawali, USAID/Nepal (M&E Specialist)

Radhika KC, Hariyo Ban Project (M&E Associate)

Rajani Kayasthi, Suaahara Project (Senior M&E Coordinator)

Rajendra Lamichhane, Hariyo Ban Project (Senior M&E Specialist)

Rajiv, Suaahara Project (Data Manager)

Scott Thomas, MEL Project (COP)

Shibesh Regmi, MEL Project (Deputy COP)

Tom Zearley, USAID/Nepal (Regional Science and Technology Advisor, South Asia)

ANNEX 2 – DOCUMENTS REVIEWED

USAID/Nepal Hariyo Ban, *Annual Report, July 2014 – June 2015.* 14 September 2015 Final Report.

USAID/Nepal KISAN, *Annual Report, 1 July 2014 – 30 September 2015,* 30 October 2015, Final Report.

USAID/Nepal MEL, *Annual Report, April – September 2015*, 30 October 2015 Final Report.

USAID/Nepal Sajhedari Bekaas, *Annual Report #3, October 2014 – September 2015.*

USAID/Nepal, Project Maps, 23 April 2015.

USAID/Nepal Country Development Cooperation Strategy, Fiscal Years 2014 – 2018, Summary.

USAID/Nepal, "Mapping for Better Results," Monthly Newsletter, January 2013.

USAID/Nepal, 2014 – 2019 Performance Management Plan, 10 April 2015 Draft.

ANNEX 3 – LINKS TO INTERNET RESOURCES

Impact blog with earthquake map
https://blog.usaid.gov/2015/04/usaid-arrives-in-nepal-earthquake-response-efforts-begin/

Earthquake fact sheets
https://www.usaid.gov/nepal-earthquake/fy15/fs01
https://www.usaid.gov/nepal-earthquake/fy15/fs22

GIS: Mapping Nepal's Health Facilities
https://www.usaid.gov/sites/default/files/documents/1861/health_bulletin.pdf

2014 newsletter with map showing strategic focus areas
https://www.usaid.gov/sites/default/files/documents/1861/USAID%20Newsletter%20August%202014_FINAL%20Sept24.pdf

ESRI – leading GIS software developer and distributor
http://www.esri.com/

SERVIR – USAID/NASA project
https://www.servirglobal.net/

ICIMOD – Kathmandu-based research institution with strong GIS and remote sensing capacity
http://www.icimod.org/

U.S. Government using map of Nepal in Request for Information for GIS technical support
http://www.federaltimes.com/story/government/it/2015/01/27/usaid-geospatial-data-analytics/22423567/

ANNEX 4 – EXAMPLES OF USING GIS FOR PROGRAM PLANNING, DESIGN, AND COORDINATION

Several of USAID/Nepal's projects collect geo-coded performance-related data already. The mission also has access to other relevant data sources that can help provide context at the program level. With GIS, these datasets can be combined and analyzed to reveal complex spatial relationships and patterns. An example from Timor-Leste illustrates the process of layering and data integration (**Figure 5**).

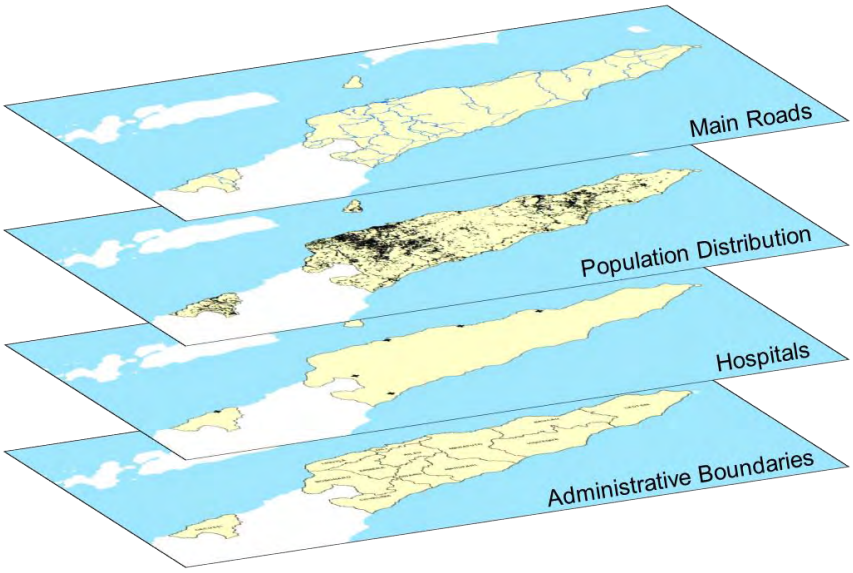


Figure 5: Layering and Data Integration with GIS

Figure 6 shows the result of applying analytical techniques to these layers of spatial data—in this case, distance from people's homes to roads and hospitals. This analysis reveals which populations have limited access to hospitals.

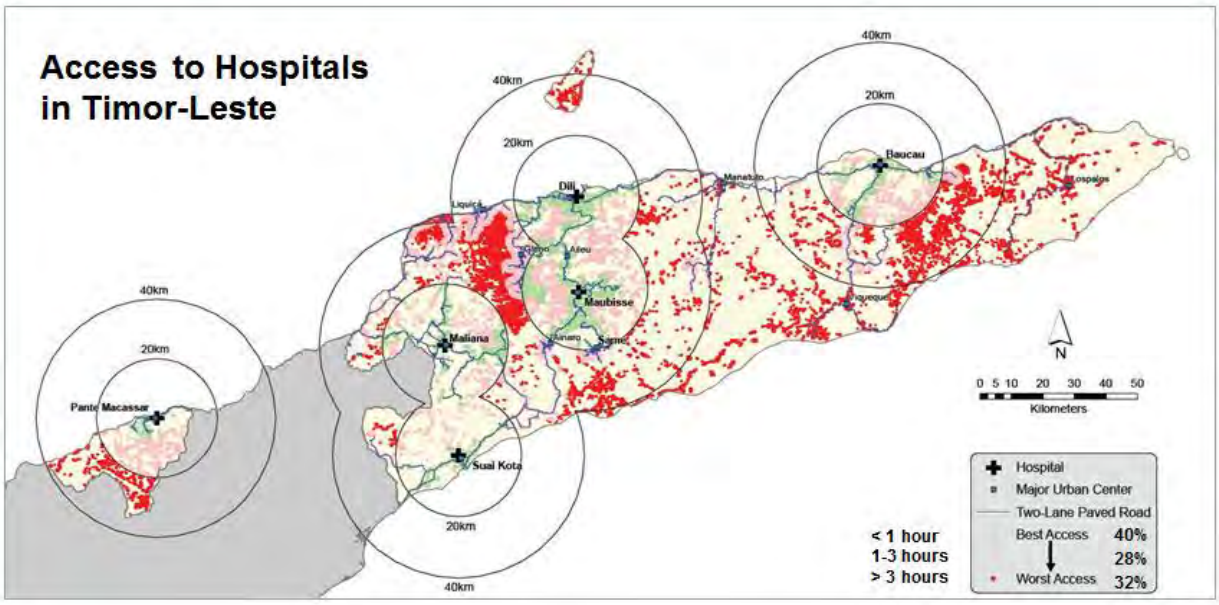


Figure 6: Example of Spatial Analysis on Access to Hospitals in Timor-Leste

With GIS analysis, basic thematic datasets now offer a visual basis for siting new health facilities, targeting communities for mobile health services, or improving transportation links. This is very useful information for the government of Timor-Leste and its partners in the health sector.

USAID/Nepal has done some of the same kind of analyses in the health sector. **Figure 7** shows the vital questions posed by spatial thinking and the map that resulted from answering those questions using geographic information.

The map will help answer the following:

- Are Nepal's health facilities located where they can serve people best?
- Are the birthing centers located within a convenient distance to reduce delays in possible fatal deliveries?
- If and when a disaster strikes, which health facilities would be accessible and what kind of services would they provide?
- Who needs to have access to this type of information and when?
- What percentage of health facilities have access to road, electricity and running water?

Figure 7: Use of GIS Analysis to Answer Spatial Questions
(From USAID/Nepal Health Bulletin, February 2014)

Posing and answering questions such as these requires spatial thinking by everyone involved, not just GIS specialists.

ANNEX 5 – EXAMPLES OF USING GIS FOR MORE EFFECTIVE M&E

More and better use of GIS is simply a continuation of a long-term initiative that USAID/Nepal began many years ago. There are many ways to build on this. One specific area that would bring the mission a good return on its investment, and at the same time begin to fill one of the key gaps highlighted by this assessment, is in M&E.

The mission's M&E process is based on a well-established, Agency-wide Results Framework which is somewhat flexible and customizable to accommodate the diverse nature of mission and IP activities. Within that framework, indicators commonly focus on the following kinds of information:

- Human – number of farmers trained, number of children immunized.
- Physical – number of hectares planted, number of clinics built.
- Financial – changes in income, changes in gross margins.

Indicators are designed so that results are almost always reported as numerical and percentage changes from baselines. Indicators are often broken down by age, gender, caste, religion, employment type, or other socioeconomic characteristic, but rarely geographically. There is little analysis of spatial variability at any level.

Two Examples of What Spatial Thinking Can Do for M&E

A. An example from Sajhedari Bikaas (**Figure 8**) shows results for four indicators without geographic disaggregation. While presenting the results in this way is useful for showing in general how the project is performing (i.e., above target on indicator 2 but behind on indicators 1, 3, and 4), it gives no sense of geographic variability within the project area.

Indicators	Annual Target Oct 2014–Sep 2015	Annual Achievement Oct 2014–Sep 2015
1. Number of individuals who received USG-assisted training on inclusion (GESI charter) and the understanding of the root causes of the conflict	4,500	3,412
2. Number of youth who have started a business or found a job through the YI activities	168	175
3. Number of youth groups and CMUs that have been established/revived/operational in the reporting period	57	35
4. Number of people who have been trained on the different YI training programs	625	492

Figure 8: Sample of Indicators
(from Sajhedari Bikaas Annual Report, Oct. 2014–Sept. 2015)

Meanwhile Sajhedari Bikaas already collects disaggregated data geo-coded for both districts and VDCs. Applying spatial thinking to the data and using GIS to analyze and present disaggregated data geographically could show how performance varies within

the project area, help identify gaps and overlaps, and possibly shed some light onto why there are differences from VDC to VDC and how those differences might be influencing the impact the project is having.

S.N.	Land-scape	Partner	Name of forest CFUG/BZCFUG	District	VDC/ Municipality	Total HHs	# of Vulnerable HHs	Caste/Ethnicity (vulnerable HH)					CAPA status (Y/N)		
								BCT	Janjati	Dalit	Madhesi	Others	Pre-pared	En-dorsed	Imple-mented
1	TAL	FECOFUN	Jalan CFUG	Banke	Baijapur	91	19	0	16	0	3	0	Y	Y	Y
2	TAL	FECOFUN	Ramjanaki	Banke	Baijapur	43	25	0	24	1	0	0	Y	Y	Y
3	TAL	CARE Nepal	Babukuwa	Banke	Basudevpur	33	33	3	18	10	0	2	Y	Y	Y
4	TAL	CARE Nepal	Kaneshwori	Banke	Binauna	70	42	16	23	2	0	1	Y	Y	Y
5	TAL	CARE Nepal	Kameraja	Banke	Binauna	45	45	29	13	3	0	0	Y	Y	Y
6	TAL	CARE Nepal	Samayabhawani	Banke	Binauna	38	38	6	32	0	0	0	Y	Y	Y
7	TAL	CARE Nepal	Siddheshwori	Banke	Binauna	65	54	8	43	3	0	0	Y	Y	Y
8	TAL	CARE Nepal	Sunkholi	Banke	Binauna	83	83	1	82	0	0	0	Y	Y	Y
9	TAL	CARE Nepal	Ashok CFUG	Banke	Kachanapur	47	47	1	45	0	0	1	Y	Y	Y
10	TAL	CARE Nepal	Babukuwa	Banke	Kamdi	30	30	2	24	4	0	0	Y	Y	Y
11	TAL	CARE Nepal	Babukuwa	Banke	Kamdi	42	42	31	3	7	0	1	Y	Y	Y
12	TAL	CARE Nepal	Chhagrahawa	Banke	Kamdi	35	21	5	0	2	14	0	Y	Y	Y
13	TAL	CARE Nepal	Purnima Mahila	Banke	Kamdi	39	39	26	7	4	2	0	Y	Y	Y
14	TAL	WWF Nepal	Bulbule and Kalakhola BZCF	Banke	Kohalpur	226	96	43	48	5	0	0	Y	Y	Y
15	TAL	CARE	Chauridada CFUG	Banke	Manikapur	14	14	3	7	4	0	0	Y	Y	Y

Figure 9: Sample of Indicators from Hariyo Ban on CAPAs, to June 2015

An example from Hariyo Ban illustrates the value of applying spatial thinking. The table in **Figure 9** is an extract from Hariyo Ban's Annual Report (July 2014 – June 2015). The sub IR for this indicator is*: 3.2.3. Developing and supporting implementation of gender equitable and socially inclusive community adaptation plans of action (CAPAs)*.

Not only did Hariyo Ban report its results for this indicator at the top level of aggregation as a single number, the project also broke the numbers down geographically. With the CAPA data geo-coded (**Figure 9**) and the locations mapped (**Figure 10**), it is possible to analyze Hariyo Ban's activities to get a detailed understanding of where it has been working, how its activities relate to other programs doing similar work, and where there might be significant gaps.

Thinking spatially in ways like this can help mission staff better monitor the implementation and success of their programs and activities.

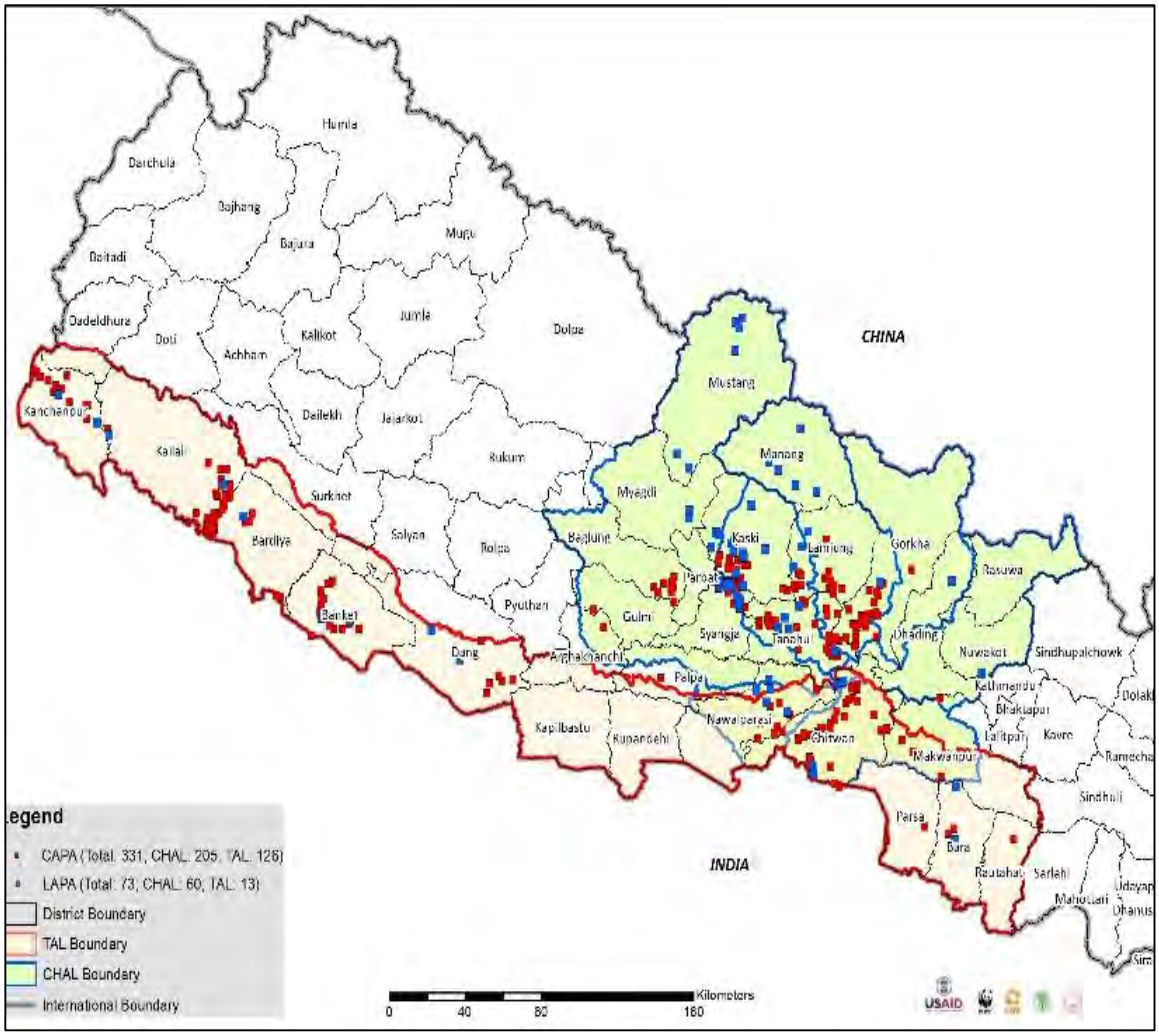
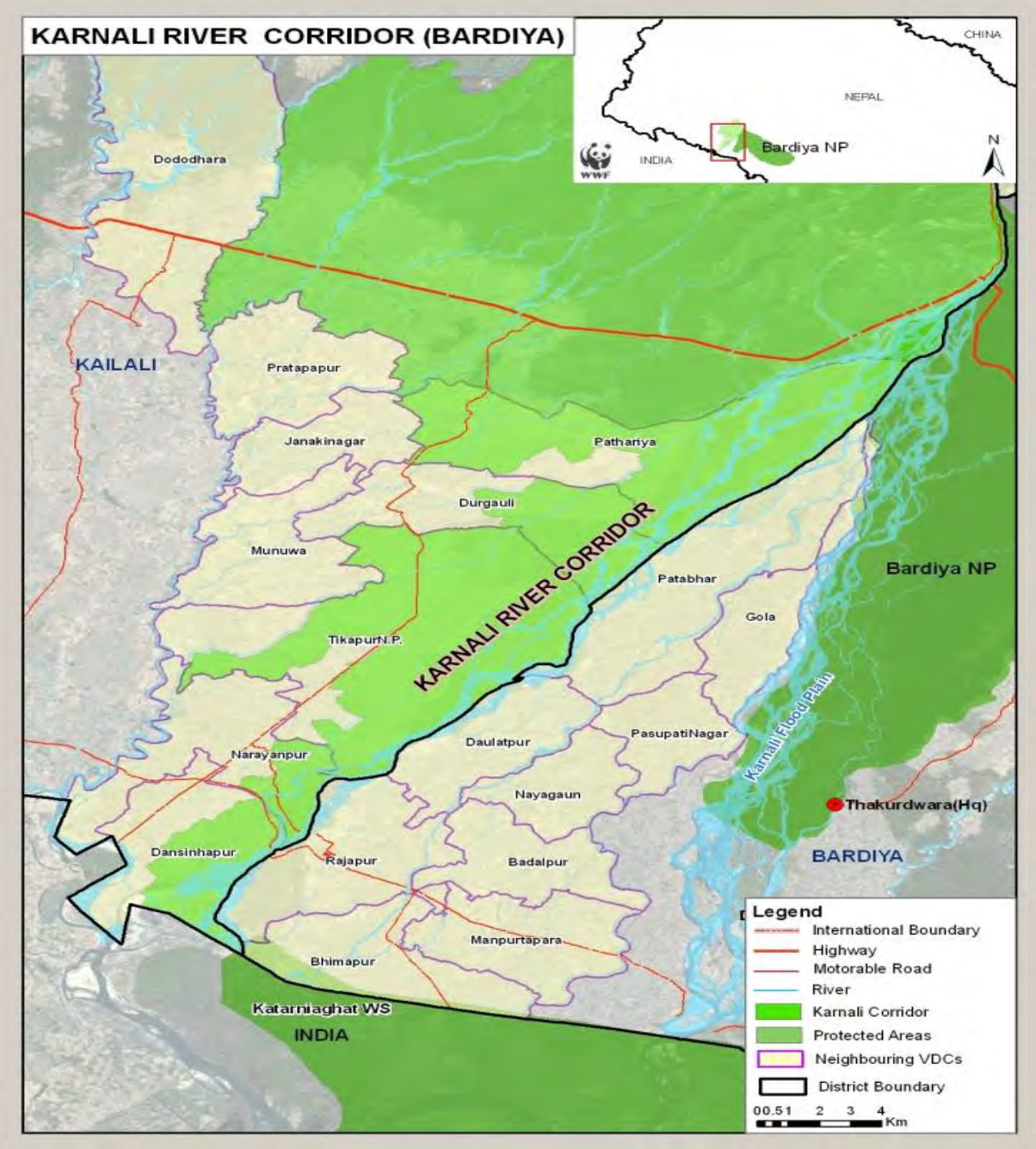
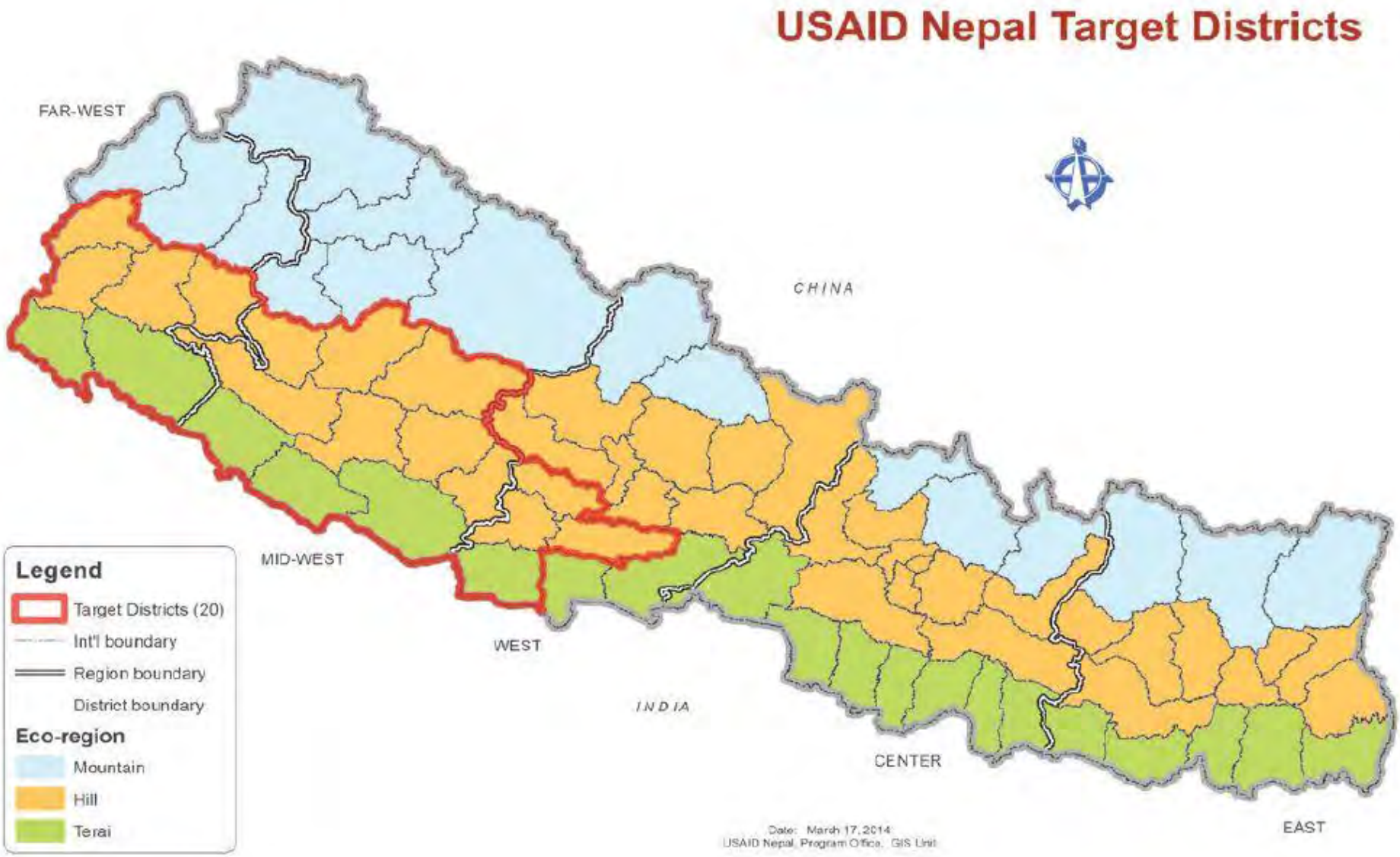
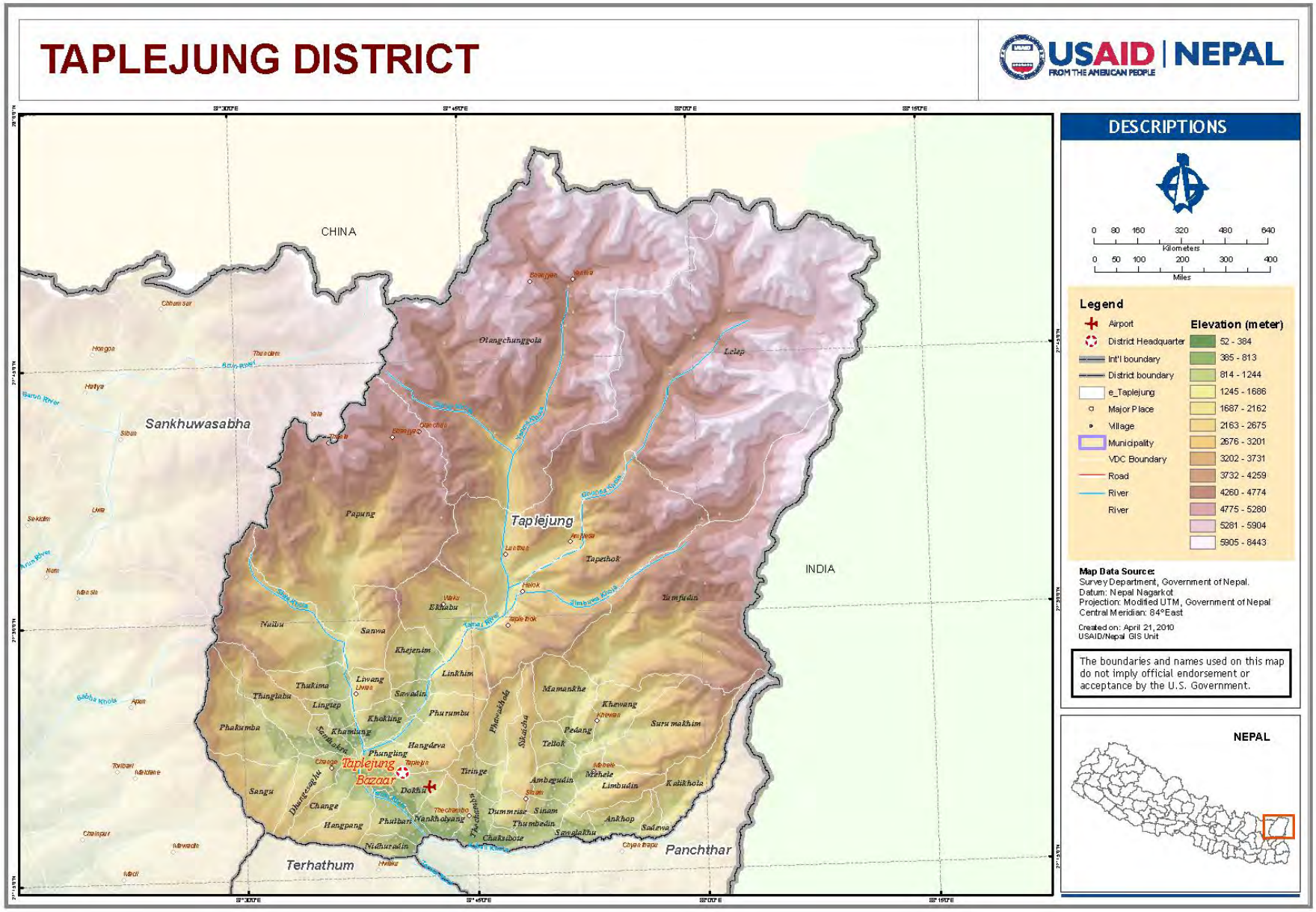


Figure 10: CAPA and LAPA Locations
(from Hariyo Ban Annual Report, 2015)

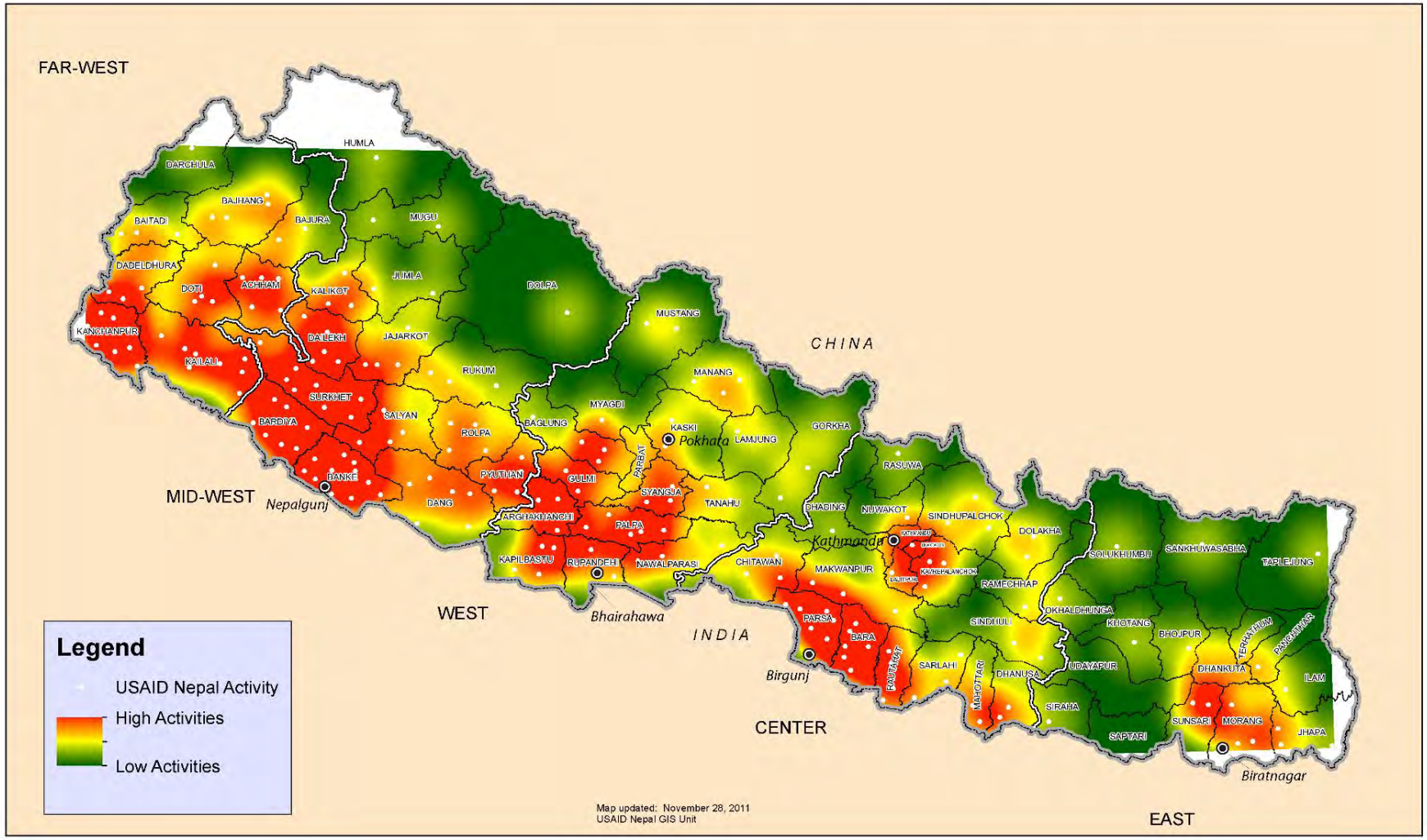
ANNEX 6 – EXAMPLES OF MAPS PROVIDED FOR REVIEW




USAID Nepal Target Districts
FAR-WEST
CHINA
MID-WEST
WEST
INDIA
CENTER
EAST
Legend
Target Districts (20)
Int'l boundary
Region boundary
District boundary
Eco-region
Mountain
Hill
Terai
Date: March 17, 2014
USAID Nepal, Program Office, GIS Unit

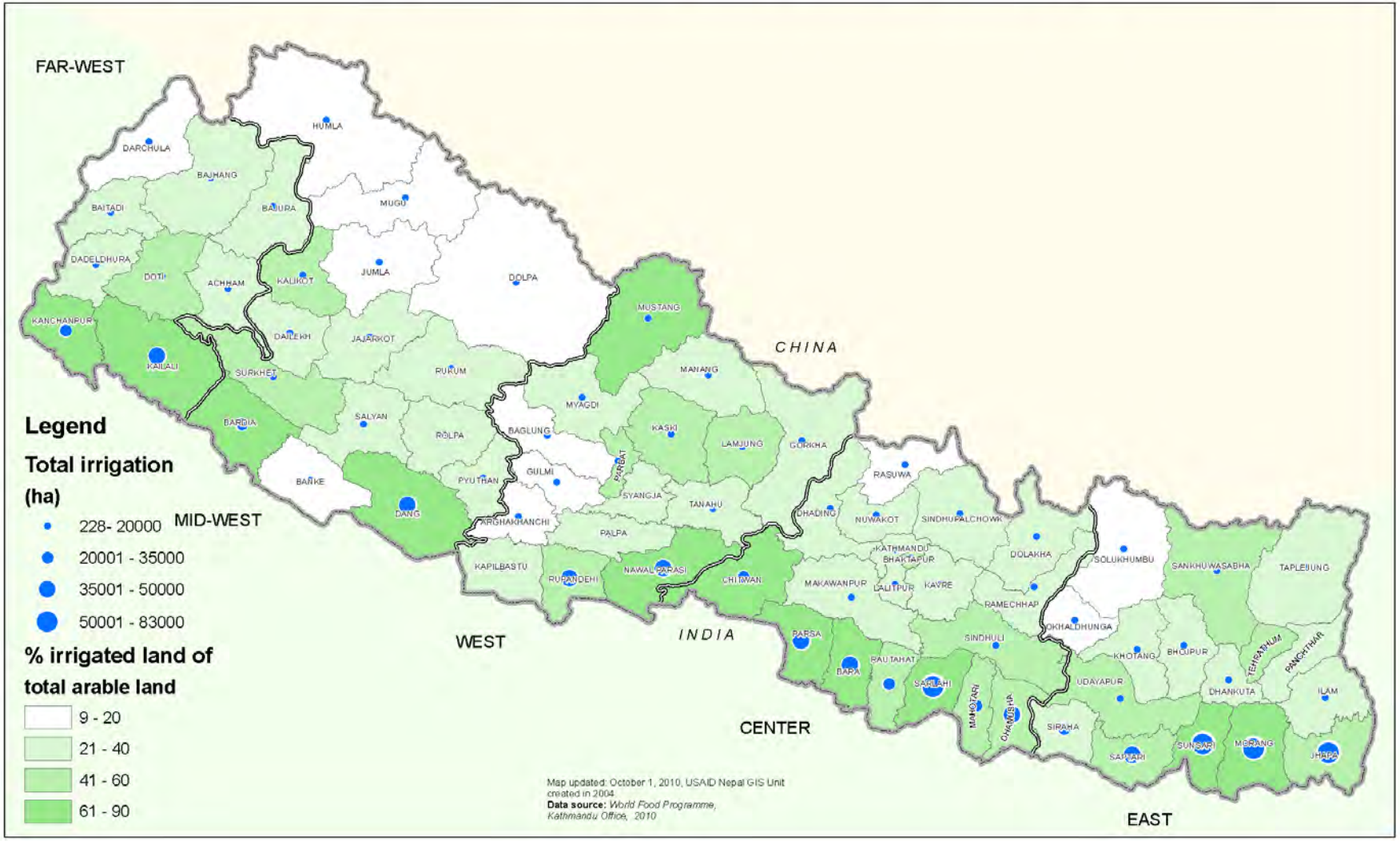

TAPLEJUNG DISTRICT
USAID | NEPAL
FROM THE AMERICAN PEOPLE
CHINA
INDIA
Sankhuwasabha
Terhathum
Panchthar
Taplejung
Taplejung Bazaar
Papung
Olangchunggola
Lelep
Tapethok
Tumfudin
Ekhabu
Nalbu
Sanwa
Khejenim
Linkhim
Mamankhe
Khewang
Suru makhim
Pedang
Tellok
Tiringe
Ambegudin
Limbudin
Kalikhola
Ankhop
Sadewa
Sawalakhu
Chaksibote
Sinam
Thumbedin
Dummrise
Nankholyang
Phulbari
Hangpang
Nidhuradin
Change
Sangu
Dokhu
Phunglung
Hangdeva
Khamlung
Khokling
Phurumbu
Sawadin
Lingtep
Thinglabu
Thukima
Liwang
Phakumba
Phakphokhola
Sikachha
Thechambu
Thumbemin
Chaksibote
Dhungesaghu
Sangu
Tolibari
Makalane
Chaimpur
Mawadin
Madi
Hwaku
Nidhuradin
Apsin
Babha Khola
Arun River
Sabha Khola
Tamor River
Simbuwa Khola
Ghunsa Khola
Yangma Khola
Tapethok
Helok
Taplejung
Papung
Olangchunggola
Lelep
Bhanjyang
Yamphu
Chhumsur
Hongoa
Thendam
Hatiya
Yala
Sibun
Sekidim
Uwa
Mum
Mansin
Arun River
Barun River
Tamor River
Kilometers
0 80 160 320 480 640
Miles
0 50 100 200 300 400
DESCRIPTIONS
Legend
Airport
District Headquarter
Int'l boundary
District boundary
e_Taplejung
Major Place
Village
Municipality
VDC Boundary
Road
River
River
Elevation (meter)
52 - 384
385 - 813
814 - 1244
1245 - 1686
1687 - 2162
2163 - 2675
2676 - 3201
3202 - 3731
3732 - 4259
4260 - 4774
4775 - 5280
5281 - 5904
5905 - 8443
Map Data Source:
Survey Department, Government of Nepal.
Datum: Nepal Nagarkot
Projection: Modified UTM, Government of Nepal
Central Meridian: 84°East
Created on: April 21, 2010
USAID/Nepal GIS Unit
The boundaries and names used on this map do not imply official endorsement or acceptance by the U.S. Government.
NEPAL

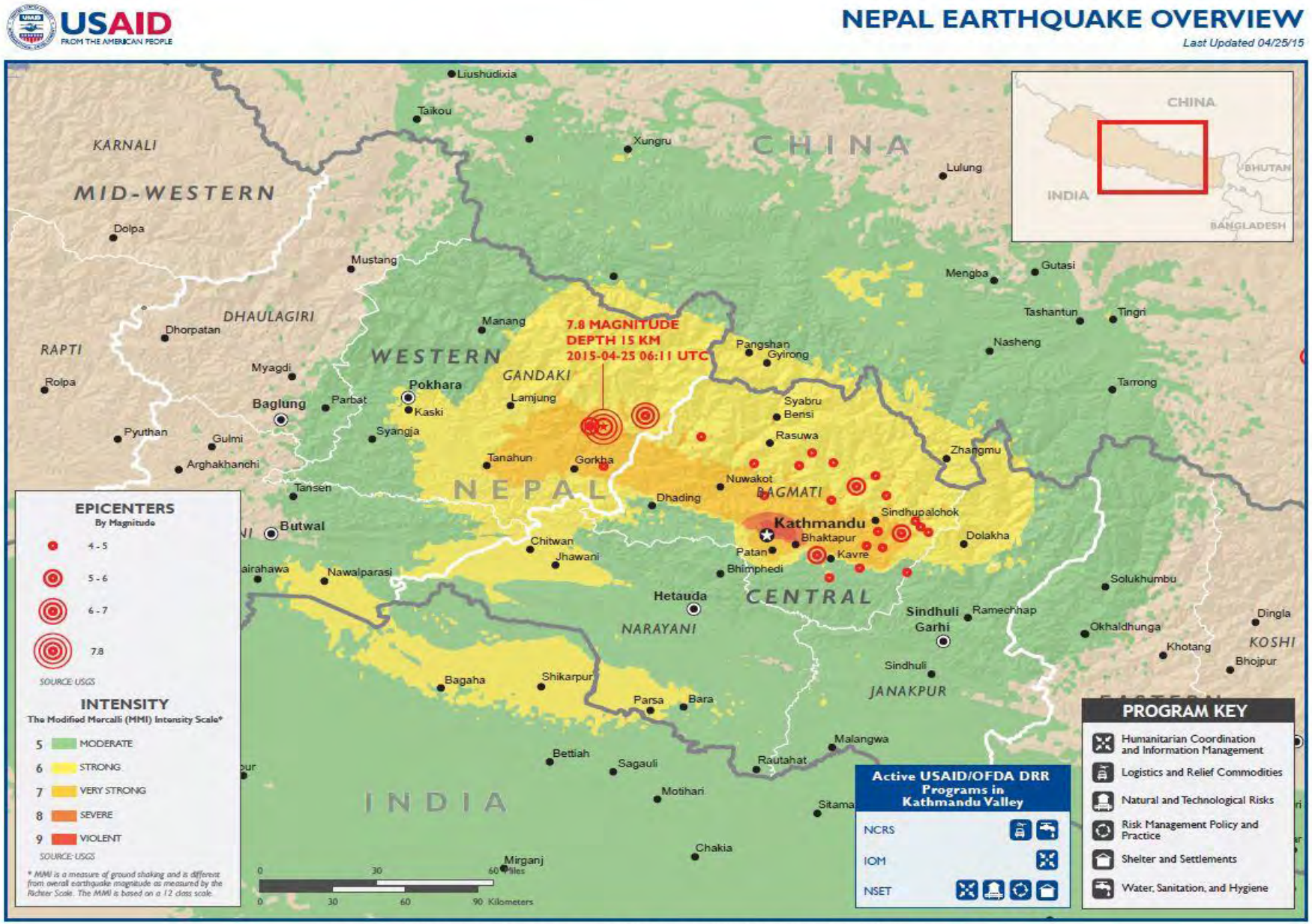
USAID Nepal - Active Projects Heat Map As of December 2011



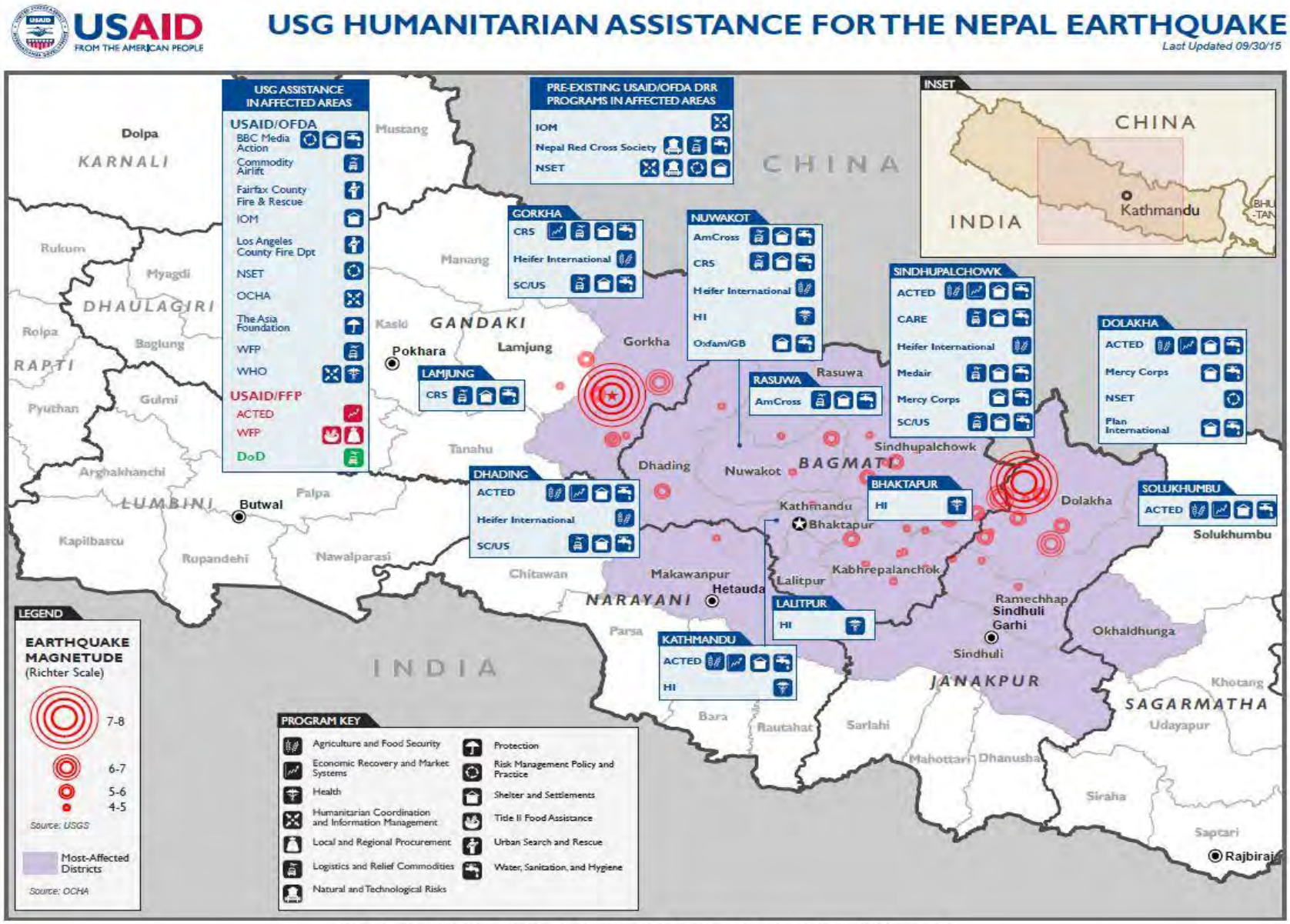
TOTAL IRRIGATION AND AREA OF IRRIGATED LAND

USAID | NEPAL
FROM THE AMERICAN PEOPLE





The boundaries and names used on this map do not imply official endorsement or acceptance by the U.S. Government.



The boundaries and names used on this map do not imply official endorsement or acceptance by the U.S. Government.

U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523