Summary: Growing energy deficits in Afghanistan and Pakistan have served to significantly impede economic growth and development potential. Simultaneously, upstream Central Asian countries such as the Kyrgyz Republic and Tajikistan boast significant and untapped hydropower potential and electricity surpluses in the summer months. The World Bank is currently supporting the development of a regional dialogue on developing an energy market that could serve to link Central Asia and South Asia in a regional energy market. The first step in the development of this regional energy market is being developed under the proposed CASA 1000 project, under which investments in transmission and distribution infrastructure between four countries, and the development of the terms of trade for electricity is expected to be undertaken. As a part of this work, the World Bank has commissioned studies to examine the scope and nature of possible benefit sharing arrangements with local communities en route. This work finds that there is significant scope for community benefit sharing arrangements, which could serve to enhance the sustainability and poverty reduction impacts of the project.

I. Introduction

1. With growing populations and rapidly developing economies, both Pakistan and Afghanistan are experiencing mounting pressures on their domestic power grids. Unmet demand for power is a severe constraining factor for growth and stability in the region, and both Pakistan and Afghanistan face challenges in accessing reliable supplies of imported energy. In contrast, both the Kyrgyz Republic and Tajikistan are rich in hydropower resources and boast significant untapped potential for hydropower development. However, much of this electricity production faces seasonal fluctuations in production, with electricity surpluses created during the summer months and deficits occurring in the winter months.

II. Background

2. Growing Electricity demand in South Asia. Both Afghanistan and Pakistan face rising demand for electricity. After decades of civil conflict, much of Afghanistan’s electricity networks have been neglected or destroyed. According to official sources, only 20 percent of the population in Afghanistan has access to electricity, with total energy consumption at around 25 KWh per capita per year—one of the lowest in the world. Rural areas, where more than 77 percent of Afghan population lives, remain practically unconnected to the grid or other affordable, sustainable power supply options. Some estimates put rural access to electricity at a mere 9 percent of the total Afghanistan population.

3. Pakistan is also currently facing acute energy crises including shortages in electricity supply and large scale power outages. Energy consumption is 480 KWh per capita per year, and the generation gap
is estimated at between 4,000 and 6,000 MWs annually, and reached a peak of 8,500 MW in June 2012, accounting for more than 40 percent of national demand. Disputes over payment arrears, particularly from the public sector, have resulted in private providers slashing services. Widespread power outages, particularly in the summer months when temperatures are high, have resulted in periodic protests and social unrest.

4. **Linking surplus energy from Central Asia.** Both Tajikistan and the Kyrgyz Republic have substantial (about 80,000 MW) hydropower potential, only a relatively small proportion of which (about 10%) has been developed to date. A major part of the river flows occur during the summer period, generating large electricity surpluses during those months. At the time of development in the 1970s, Central Asia’s energy infrastructure was designed to optimize the needs of Central Asian Republics, and the surplus energy generated was traded for fossil fuels in the winter months, when electricity generation declined. Following the collapse of the Soviet Union, disputes over the timing of hydropower discharges, the availability and prices of fossil fuels, and allegations over excessive withdrawals from the regional grid led to mounting regional tensions and the effective end of the Central Asia Power System (CAPS). With the collapse of regional energy trade, both Tajikistan and the Kyrgyz Republic became increasingly reliant on the domestic production of electricity through hydropower.

5. While both countries have significant untapped potential for hydropower development, this form of electricity is highly seasonal with peak production occurring in summer months. However, peak demand for electricity occurs in the winter months, when river flows are at their lowest and there is minimum availability of electricity generation. The reliance on electricity for heating in the winter months has served to strain the existing transmission and distribution networks in the winter months. As a result, around 70 percent of the population in Tajikistan suffers from blackouts during the winter months, and load shedding of up to 12 hours per day occurs in both countries during the winter months. This has led to social tensions and grievances in the energy sector.

III. **Developing a Regional Energy Market (CASAREM)**

6. **Developing a regional energy market:** Both the Kyrgyz Republic and Tajikistan could benefit from exporting surplus hydropower during the summer months, particularly since this surplus cannot be stored for winter months, when both countries face acute shortages. Similarly, the reliable supply of imported energy from Central Asian countries would improve the access to electricity in Afghanistan and Pakistan. Revenues from the exported energy could serve to secure energy imports during the winter months in the Kyrgyz Republic and Tajikistan. The development of a transmission system from existing Kyrgyz and Tajik hydropower plants, also known as the CASA 1000 project, is the first phase in the development of a Central Asia-South Asia Regional Electricity Market (CASAREM) with a vision of fostering economic cooperation and electricity trade amongst countries of the two regions, eventually linking energy supplies between the Urals and South Asia.

7. **Proposed Central Asia South Asia Electricity Transmission and Trade Project (CASA 1000):** An initial feasibility study of the CASA-1000 project has proposed the construction of transmission infrastructure from the Kyrgyz Republic and Tajikistan to export electricity to Afghanistan and Pakistan. Specifically, the proposed project would comprise: (a) around 750 km High Voltage Direct

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Current (DC) transmission system between Tajikistan and Pakistan via Afghanistan with 1,300 MW converters in Tajikistan and Pakistan; (b) a 300 MW DC to Alternate Current (AC) converter station in Kabul to supply Kabul area; (c) a 477 km long and rated at 1,000 MW AC transmission link between the Kyrgyz Republic and Tajikistan to supply Kyrgyz electricity to South Asia via Tajikistan; and (d) the concomitant institutional and legal framework to enable such electricity trade.

8. **Technical Feasibility.** The feasibility update completed in early 2011, confirms the soundness of the considerations that led to the development of the Central Asia-South Asia Regional Electricity Market (CASAREM) program and especially for the CASA-1000 project. This assessment found that sufficient quantities of surplus electricity are available in the Central Asian Countries (the Kyrgyz Republic and Tajikistan), even under conservative assumptions of no new generation projects. This assumption results in declining profile of available summer surplus for exports, progressively declining to half over 12 years. The economic analysis for the conservative base case gives a benefit-cost ratio of 1.34 (for a discount rate of 10%) and an EIRR of 15.6%. Any generation added, for reducing the prevalent severe winter shortfall in these countries, will add to the available summer surplus for CASA and improve the project viability. In addition, the study found a significant need for electricity imports exists in South Asia (particularly Pakistan) to meet existing and projected demand. Finally, differences in the cost of electricity between the importing and exporting countries potentially provide a justifiable rationale to make transmission investments in order to support the electricity trade.

9. **Environmental and Social Impact Assessment.** Based on the updated technical feasibility study, a combined Environment and Social Impact Assessment and Environment and Social Management Plan was commissioned in 2010. This assessment found that no significant environmental and social impacts of the CASA 1000 project are predicted that cannot be mitigated by implementation of an Environmental and Social Management Plan (ESMP). The assessment found that most of the right of way (RoW) in the Kyrgyz Republic, Tajikistan, Afghanistan and Pakistan is arid, poorly vegetated and supports low biodiversity. Agriculture is found in less than 10 percent of the RoW in the Kyrgyz Republic and Tajikistan but nonetheless forms an important economic activity, and passes through larger areas of agriculture in Afghanistan and Pakistan. Overall, while the potential environmental and social impacts are likely to be well managed with appropriate management plans, the length of the proposed transmission line and the complexity of construction across four countries would merit attention to mitigation measures.

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4 The feasibility includes under construction Sangtuda-2 project only (partially commissioned) from the new projects in the generation expansion plan and does not include Rogun hydropower project.
Figure 1: Map of the Proposed Central Asia South Asia Power Transmission Project (CASA-1000)
IV. Benefit Sharing Studies under CASA 1000

10. **Benefit Sharing under CASA-1000:** The proposed CASA 1000 project is exploring the possibilities to develop and implement community benefit-sharing measures to ensure that poor and vulnerable communities along the transmission infrastructure in all four countries—Afghanistan, Pakistan, Tajikistan and Kyrgyz Republic—also benefit from the investments. Introducing a benefit sharing arrangement under the CASA 1000 project would represent one of the few instances where global best practice in community engagement for infrastructure development would be applied to a transmission line project. To explore options for the development of benefit sharing under the proposed project, a country studies were commissioned to better understand the context and the scope for such a program.

11. **Objectives.** The objective of the four studies was to analyze the socio-economic impact of the proposed CASA-1000 project on communities en route and to identify and develop options for community benefit sharing program for CASA-1000 project. As such, studies were commissioned for all four countries to (i) verify the communities en route; (ii) identify, through focus group discussions, the main priorities for communities along the proposed transmission route; and (iii) identify possible institutional arrangements for benefit sharing opportunities, as well as some indicative costing arrangements. This work would serve as a first step in identifying the key stakeholders under a benefit sharing arrangement, as well as a list of priority benefits for local communities impacted by the transmission infrastructure.

12. **Methodology.** The methodology used for the studies was largely qualitative and exploratory in nature, as the objective of the study was to understand community needs and priorities. A series of focus group discussions were held with communities within the corridor of impact of the proposed CASA 1000 project. Where feasible, focus group discussions were held in all communities (i.e. Tajikistan). In other countries, focus group discussions were held in a subset of the total area, such as in Afghanistan (57 communities or 10 percent of the total area) and in Pakistan (13 communities or 50 percent of the total area). In addition, key informant interviews were conducted with key officials and leaders in the communities. Finally, in the Kyrgyz Republic and in Tajikistan, a baseline socio-economic survey was conducted to understand the main livelihoods of the area.

13. **Proposed Corridor of Impact.** Under the CASA 1000 project, the proposed transmission infrastructure is expected to be around 1,200 kilometers (km) through four countries. Based on the proposed route alignment, a corridor of impact (COI) was drawn up to include populations residing within four kilometers (4 km) of the future transmission infrastructure. The following table gives a comparative overview the COI area within the four countries:

<table>
<thead>
<tr>
<th></th>
<th>Afghanistan</th>
<th>Kyrgyz Republic</th>
<th>Pakistan</th>
<th>Tajikistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of route proposed</td>
<td>562 km</td>
<td>450 km</td>
<td>71 km</td>
<td>117 km</td>
</tr>
<tr>
<td>Total Population Impacted (est.)</td>
<td>151,947</td>
<td>42,685</td>
<td>68,000</td>
<td>35,089</td>
</tr>
<tr>
<td>Number of Districts Covered</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total number of communities impacted (est.)</td>
<td>616</td>
<td>25</td>
<td>27</td>
<td>13</td>
</tr>
</tbody>
</table>
14. **Needs Assessment of Communities.** Within the proposed Corridor of Impact (COI) of the proposed transmission infrastructure, needs assessments were conducted with a sample of local community groups and key informants to determine the main issues faced at the local level. These needs assessments were conducted in a participatory way using focus group discussions and key informant interviews. Where possible, separate focus group discussions were conducted with all female focus group discussions to understand the gender aspects of needs and priorities. Focus group discussions were held with around ten percent of the total estimated community groups in the COI for each country, and the results summarized in country level reports. For all four countries, the lack of electricity was cited as a critical need, both because of the use of electricity for heating (Tajikistan), irrigation (Tajikistan and Kyrgyz Republic), public buildings such as schools and hospitals (Afghanistan) or local businesses (Pakistan). In addition, almost the lack of access to potable and irrigation water was cited as a problem in Tajikistan, the Kyrgyz Republic, and Pakistan. Finally, the needs assessments identified issues of unemployment (Kyrgyz Republic, Pakistan) and access to basic services (Tajikistan, Afghanistan) as priority needs of communities.

15. **Community Priorities.** Focus Group Discussions (FGDs) were utilized to identify development priorities for the communities. While development priorities are closely correlated to community needs, this technique allows for community members themselves to identify solutions to development in their locality, and which could serve as a guiding set of interventions for benefit sharing. Community priorities in the main COI area were primarily focused on access to electricity, access to water supply, and the development of community-level infrastructure. In Afghanistan, there was wide variation among the communities visited; where communities were connected to the grid, or where there were plans to connect to the grid in the short term, communities prioritized other community-level infrastructure, whereas where there was no access, or planned access, to electricity, communities prioritized various off-grid electricity measures. In the Kyrgyz Republic and in Tajikistan, most communities have access to the grid, but prioritized improved reliability of electricity as the first priority. In Pakistan, electricity was the most often cited development priority, followed by employment.

<table>
<thead>
<tr>
<th>Ranking of Development Priorities</th>
<th>Afghanistan</th>
<th>Kyrgyz Republic</th>
<th>Pakistan</th>
<th>Tajikistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>On grid &amp; Off-grid electricity (Micro Hydro Power &amp; solar)</td>
<td>Reliable electricity</td>
<td>Reliable Electricity</td>
<td>Reliable Electricity</td>
</tr>
<tr>
<td>Second</td>
<td>Roads</td>
<td>Water Supply</td>
<td>Employment</td>
<td>Water Supply</td>
</tr>
<tr>
<td>Third</td>
<td>Water Supply &amp; Canals/Protection walls</td>
<td>Poverty reduction projects</td>
<td>Water</td>
<td>Poverty reduction projects</td>
</tr>
<tr>
<td></td>
<td>School buildings</td>
<td>Social Services</td>
<td>Education</td>
<td>Employment</td>
</tr>
</tbody>
</table>
V. Country Studies for Benefit Sharing

16. The following section summarizes the country studies commissioned for benefit sharing under the CASA-1000 project.

**Kyrgyz Republic**

17. **Introduction.** The Kyrgyz Republic is a mountainous and landlocked country, rich in natural resources and with significant hydropower potential. However, the southern districts, through which the route of the proposed CASA-1000 power transmission lines will pass, have a low level of economic and social development. The area is predominantly rural, and most of the local population is engaged in agriculture. The poverty level in Kyrgyzstan remains high; in 2010 approximately 33.7% of the population lived below the poverty line, and 5.3% of the population lived in extreme poverty. The population is predominantly rural (60%), with almost three fourths of the poor living in rural areas.

18. **Energy Sector.** The development of a regional energy market could serve as an important pillar of economic development for the Kyrgyz Republic. Presently, there is limited capacity to store electricity generated in the summer months. Historically, the Kyrgyz Republic sold summer surplus generation on a Central Asian market, in exchange for fossil fuels from Uzbekistan and Kazakhstan that could be used for winter months, when run of the river production was low. Today, the Kyrgyz Republic is looking for additional partners in the development of a regional energy market that looks toward the growing demand from South Asia, especially from Pakistan. In addition, sales of the summer surplus generation would not impact the winter generation. In fact, the additional revenue from the summer sales is expected to assist the utility to improve and strengthen the domestic grid to stave off supply shortages in the winter months.

19. **Corridor of Impact:** The proposed CASA-1000 transmission lines are expected to transect mountainous districts of southern Kyrgyzstan of Osh, Batken, and Jalalabad. The route generally traverses areas of low population densities through three southern provinces of Kyrgyzstan. The total length of the route is about 450 km in Kyrgyzstan. The total estimated population lying in the corridor of impact is estimated at 42,685. In Osh and Batken, the majority of the population is ethnically Kyrgyz, but there is a large Uzbek majority in Jalalabad province. The majority of the population is engaged in agriculture, with the main occupation being cattle grazing and cultivation of crops.

20. **Livelihoods:** In addition to agriculture, many of the households in the COI are engaged in growing fruit (81% of respondents), vegetables (81% of respondents) and raising cattle (76% of respondents). These livelihoods serve first and foremost to ensure food security of the household, and also as a source of income when surplus produce is available. Apart from fruit trees, many HHs are engaged in the cultivation of trees, whose timber is used for house construction.

21. **Community Needs and Development Priorities.** The benefit sharing scoping study undertook focus group discussions with a select number of participants from villages along the COI to better

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5 SNC-Lavalin, CASA-1000 Final Feasibility Update Report
understand the needs and priorities of local communities. Most of the participants in the focus group discussions cited the erratic provision of electricity as a serious concern, especially in the winter months. While most households are connected to the electricity grid, there is load shedding in the winter months, when hydropower production is limited, and the Government must rely on expensive energy imports to the country. Aside from the reliable supply of electricity, focus group participants indicated that the area is mostly dependent on agriculture, but that much of the irrigation systems were under maintained and in serious need of repair. The combination of reliable electricity supplies and the rehabilitation of irrigative water supply systems could help local communities to take better advantage of potential investments in agriculture processing facilities. This would also, in turn, help to address issues of unemployment (estimated at 40 percent) and underemployment that was a major contributing factor to male outmigration in the area.

**Tajikistan**

22. **Introduction.** With the collapse of the Soviet Union, Tajikistan faced economic difficulties which culminated in a civil war, and associated drops in production, macroeconomic instability, and rapid impoverishment of much of its population. Emerging from civil conflict in 1997, Tajikistan was the poorest of the post-Soviet countries. Today, the population of Tajikistan is approximately 7.3 million of which 5.3 million live in rural areas, (73% of total population). Development of agriculture is limited due to comparatively low competitiveness in the sector, leading to increasing outmigration of the population to seek opportunities in Russia and other countries.

23. **Energy Sector.** Similarly to the Kyrgyz Republic, Tajikistan boasts significant and as yet largely untapped hydropower potential. With current summer surpluses in electricity generation, Tajikistan could also benefit from the export of electricity to its South Asian neighbors. Tajikistan’s energy sector has undergone a series of reforms in recent years, aimed at improving the energy efficiency, reducing losses, and improving cost recovery. However, Tajikistan experienced a severe energy crisis in 2008, with shortages from its domestic supply culminating in widespread scarcity for heating and domestic use in the winter months. Regional linkages to South Asia could ensure that the summer surplus generation could be exported, with the projected revenues going towards improving and strengthening the domestic grid for better reliability in domestic supply.

24. **Corridor of Impact:** The proposed COI for the CASA-1000 transmission line project passes through Tajikistan’s Sughd and Khatlon provinces. The first approximately 3 km of the HVDC route, from Sangtuda 1 Hydro Power Plant on the Vakhsh River, runs to the east and the route then turns to run generally in a south/southwestern direction to cross the Tajikistan-Afghanistan border just east of Lower Pyanj. The route generally traverses areas of low population densities; clear of and well to the east of all the major centers of population in the area—Kurgan-Tyube, Vakhsh, Kolkhozabad and Dusti. The total length of the route within Tajikistan is 117 km and all of which is at an elevation below 1,000 meters above sea level (masl)\(^6\). The total estimated population in the COI is 35,089 people.

25. **Livelihoods.** The population of the villages visited in Sughd province is mostly Uzbeks (96.7%). However, in Khatlon province, Tajiks are the majority (60.9%) with a significant minority population who are Uzbeks (39.1%). All of them are mainly engaged in agriculture. The main occupation is cattle grazing at pasture places and cotton cultivation. Most of the local population holds shares of large formerly collectivized farms, with the size of the share of cultivated lands depending on the capacity of labor and material resources. In addition, the local population is engaged in the cultivation of other important agricultural crops in their homestead plots, such as tomatoes, cucumbers, onions, potatoes, wheat, etc..

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\(^6\) SNC-Lavalin, CASA-1000 Final Feasibility Update Report
26. As in the Kyrgyz Republic, remittances are an important contribution to household incomes. Around ten percent of working age adults is a labor migrant, and most are working in the Russian Federation. Most of the migrants - more than 90% are men - who leave to work abroad for seasonal work. There are also those who go for a few years, or as commonly called long-term migrants. Despite the fact that only 10-15% of the total population is labor migrants, the share has been growing. This is due to relatively high levels of unemployment, which are estimated to be as high as 60 percent\(^7\) of the working age population.

27. **Community Needs and Development Priorities.** Focus group discussions with a subsample of participants from villages in the COI revealed that reliable electricity provision, especially in the winter months, remains a high priority. While much of the local population is connected to the electricity grid, many participants indicated that the supply is poor, particularly in the winter months, when provision is often restricted to a few hours a day. Focus group discussion participants also highlighted limited access to potable and irrigation water. Problems of drought have been common in the past few years, and the need for irrigation water to produce local crops and cotton is particularly acute. In addition, focus group participants indicated that, while local infrastructure, such as roads, schools, hospitals, do exist, they are in poor condition and are in need of upgrading and improved maintenance. Finally, unemployment ranked as a serious concern among focus group participants. While the local population would not be able to actively invest funding in local infrastructure, participants indicated they are ready to contribute through “hasher”, meaning to restore, construct or carry out any other activities through organized local labor forces at the village level.

**Afghanistan**

28. **Introduction.** As per the available official source\(^8\), only 20% of the Afghanistan population is estimated to have access to electricity. This coverage is one of the lowest in the world with total energy consumption reported to stand at less than 25 KWh per capita (in comparison: India 520 KWh/year, Germany 6200 KWh/year, world average 3060 KWh/year). Approximately 23% of Afghanistan’s population (7 million people) lives in the urban areas such as Kabul, Mazar-i-Sharif, Herat, Kandahar, Jalalabad and nearly 60% of these live in the capital city of Kabul.\(^9\) Population with coverage to electricity is very much skewed towards urban areas. Current power coverage in the urban areas is estimated to be 77%, and this includes privately-owned diesel-power as well.

29. **Communities En-route and Focus Group Discussion:** A corridor width of 4 km (2 km each side of the transmission line) was considered for mapping the communities along the transmission line. Focus Group Discussion (FGD) was organized at the district level with 10% representation of communities which were selected based on certain principles such as different geography, representation of certain length along the transmission line, vulnerable group (women, returnees, IDPs, differently-able people) to address equity and inclusion issues, participation of local authorities, and existence of local community institutions etc. A total of 57 communities, spread over in 23 districts of 6 provinces, were consulted through FGDs. The FGD enabled the community members with an opportunity and space for interaction, communication and joint decision-making. The FGD was very productive as it provided valuable inputs, community concerns and their response around shared priorities regarding benefit sharing options for CASA 1000.

\(^7\) These figures were provided by focus group respondents and may not match to official data.

\(^8\) Ministry of Energy and Water, Afghanistan, 2010

\(^9\) Urban Management Support Programme (draft), March 2012, Afghanistan
30. **Obstacles to Sustainable Electricity**: Communities cited limited government investment, adverse security situation and rugged terrain as the key obstacles to having a reliable, affordable and sustainable access to electricity. Where there are transmission lines, communities said that there was no attention for extension and distribution network. Without sustainable access to electricity, communities felt disadvantaged in nearly every aspect of their lives.

31. **Key Concerns**: The key concern of communities in all the districts is that they would not be able to get direct access to on-grid connection despite the fact that the transmission line would pass through/near their neighborhood. Their other concerns are possibility of their (agriculture) land and houses being affected. There were also a few cases wherein communities said the electromagnetic waves generated during heavy thunderstorms might impact on their health particularly those of women and children, which perhaps can be attributed to their education levels and lack of knowledge.

32. **Options for Benefit Sharing**: The types of investments supported by benefit sharing must be tailored to the local development needs and community priorities. During community-wide FGDs, community discussed possible options for benefit sharing projects which can be integrated in the design of CASA 1000. The underlining principle used to reach consensus on community priorities included: (a) the present coverage of the family to electricity and the electrification plan/projects to provide electricity to the community, (b) the ability of communities to identify their most pressing priority and the ways through which these projects can contribute to lasting improvements, (c) capacity of community to effectively plan, manage and sustain projects on their own subject to availability of financing.

33. Based on the analysis of FGDs held in diverse 57 communities across 23 districts of 6 provinces, the priorities of communities en-route to CASA transmission line have been found to be 58 local level projects of which: (a) 18 (7 MHP & 11 solar) are for off-grid electricity, and (b) 40 other productive community infrastructure projects. Out of 23 districts, communities of seven prioritized for off-grid electricity projects, and the rest identified for other infrastructure projects because of either existing connection or confirmed projects for on-grid electricity from the Government.

34. **Energy Saving Interventions**: In rural Afghanistan, energy saving interventions is quite limited. However, it is possible to improve energy efficiency in many ways at the household level. In villages with access to electricity, communities were found to have been using energy efficient compact fluorescent lamps instead of high watt traditional bulbs. In some of the relatively well-off communities, about 10-30% of the community members were found to be using heat preserving Bukharies. Improved Cook Stoves and Biogas Plants are limited in use, women in many districts of all provinces said that they would like to resort to these to improve their kitchen environment and health conditions provided that there are software programs. While none of the communities were found to be practicing solar thermal technology, some communities in Nangarhar, Kunduz and Baghlan were found to be keen. Given that economy of rural communities is primarily agriculture, there is a widespread interest on improved pumping systems for irrigation and efficient water use such as drip irrigation. Communities had no idea about wind energy technology perhaps due to lack of knowledge and qualified service providers.

35. **Community Institutions**: Five types of community institutions were found be in existence across six provinces. As the locally elected institutions, the Community Development Councils (CDCs) are in existence in all the FGD communities. These CDCs are governed by the CDC by-laws and have an important role in ensuring community priority projects are selected for implementation. Irrigation Associations were found to be well functioning in many communities of six provinces, some since time immemorial. The key roles performed by Irrigation Associations are operation and maintenance, equitable water distribution, and collection of service fees. Youth Associations were found in some communities, these empower Afghan girls and boys by enabling them to participate in education and social cohesion
activities. Self-Help Groups were found to be popular in many communities, providing a convenient vehicle for community members to engage in savings, livelihood and social activities. Agriculture Cooperative, present in limited number of communities, is engaged in the promotion of agriculture activities and seeds. It is very important to explore the possibility of utilizing these community institutions and minimize the creation of new institutional structures especially when an existing community institution is well suited for supporting implementation and operation and maintenance of benefit sharing projects.

Pakistan

36. **Introduction.** The proposed transmission line route in Pakistan falls almost entirely within the Federally Administered Tribal Area (FATA) region, a semi-autonomous tribal region in northwestern Pakistan. FATA is directly governed by Pakistan’s federal government through a special set of laws that allows for significant recognition to tribal administration and structures, which play an important role in local administration and decision-making through tribal council structures (*Jirgas*). Pakistan’s military entered FATA in 2001, and the subsequent decade has seen a number of skirmishes with the army, which frequently turns violent. The proposed CASA-1000 transmission line follows the areas along the Torkham-Jamrod Road. The initial topography on the border with Afghanistan is mountainous and after 55km enters into a flatter region and agricultural areas that terminates at Sheikh Muhammadi substation at Peshawar. The mountainous portion of the COI from Torkham to Peshawar lies on the southern flank of Hindu Kush Range where elevations vary in height from 800-2000 meters above sea level. Most of the COI in the 50 kilometers from Torkham to Bara is unproductive, unused, and barren. Agriculture is limited in the tribal region due to rocky soils, steep slopes, lack of suitable land and limited water supply. Scanty shrub vegetation along slopes and other areas are used as grazing and fuel wood gathering. There is relatively little agriculture in the Northern two thirds of the COI. Most of the farming occurs between Jamrud and Peshawar in the towns of Sheikh Khan, Bara and Sheikh Muhammadi, where the land is relatively good. Approximately 27 settlements were identified as being located near the COI in Khyber Agency of FATA and in the district boundary area of Peshawar.

37. **Energy Sector.** Although over 71 percent of the households along the proposed COI reported that they are connected to the electricity supply system, most reported significant shortfalls or disruptions in supply. Frequent skirmishes and conflict between para-military forces and anti-government groups has completely paralyzed the electricity distribution and tariff collection system in Khyber agency and peri-urban areas of Peshawar. Although the supply network to some extent is maintained and electricity is provided under PESCOs load management plan, the tariff collection system has been almost completely abandoned; many respondents indicated that they have not paid for the use of electricity for at least ten years. The Electricity distribution company (PESCO) under its load management plan uses a three tier load stoppage schedule for industrial sector, urban and rural areas respectively. The current scheduled electricity disruptions for rural areas range between 12 to 16 hours a day. The local grid stations based on the load availability further adjust their own priorities for different areas. The reported average for the surveyed villages was only 2 hours per day of electricity provided. The low voltage in the peak hours (5-10 pm) is reported as the major problem when households needs electricity for lighting, for cooking, for heating in winter and for electric fans during summer evenings. As the entire area is barren hills and deficient for fuel wood, most women electric heaters or dung cake for cooking. Shortages of low voltage of electricity in the peak hours cause problems for women with cooking at the household level.

38. **Socio-Economic Profile.** In order to better understand the development needs and priorities, the study divided the proposed route into three sections, based on the prevalent tribal branches in the area. Three main tribes Mohmand, Afridis and Shinwaris are settled in each section. The villages in each section are further inhibited by sub-tribe/ branch are locally called *Khel* or *Zai*. The size of the villages varies from 200 to over 1000 households. Household structures in this area are typically patterned on a joint family system, making household size as high as 20 to 26 persons in one compound. In addition, the
study focused on a subsample of villages that was further stratified by proximity to the proposed transmission line route; a subsample of villages were chosen based on their location within 50 meters to the line, and a further subsample focused on villages outside of 50 meters of the line. The findings from each of the sections of the transmission line are summarized below:

a. **Section-A: Sheikh Muhammadi Grid Station to Karkhano Bazar:**

39. Around 20 kilometers (km) of the proposed transmission line (28 percent of the total length proposed in Pakistan) is in Section A, which forms the south–western outer ring of Peshawar. It is a mix of tribal and peri-urban localities. The landmass is flat with irrigated agriculture lands. The economy of this area is dependent on agriculture and provision of services and labor to the urban population of Peshawar city.

40. The settlement pattern is typical of a peri-urban habitat, where housing patterns have shifted from larger extended family compounds to smaller sizes to accommodate more low income people and daily wage earners. Housing structures are mostly katcha but electrified and in some the basic amenities are available. In-house drinking water facility is ensured through hand pumps and piped water schemes. All the villages are connected with Peshawar through roads with sufficient public transport. Basic health facilities are available within the localities through public dispensaries and private practitioners.

41. In contrast to the FATA areas of the proposed transmission line where land ownership is under tribal customary laws the land tenure and ownership from Jamrud to Peshawar is governed under the KPK provincial legislation. A total of 5 villages were selected in this section for the study. The total households in these villages are 9550 while the total population, with an average of 6.97 peoples per household, is 66,513.

b. **Section-B: Jamrud to Haji Ayub Kaley:**

42. Around 30 Km (45 % of the TL) of the proposed transmission line is located in the Afridi tribal area. This area frequently experiences tribal conflict with the Shinwaris, and is considered highly insecure to travel by road. The area represents a very strong and active presence of Lashkar-e-Islam (a group affiliated with the Taliban), and has experienced conflict between local Sunni Muslim groups and followers of Tablighi Jamat. The entire route of the proposed transmission line is barren hilly terrain. As a result, the local population does not engage much in agricultural production, but instead works primarily in areas of trade and commerce, transport, and the delivery of trade goods between Peshawar and Turkham. The area is governed by local tribal regulations, allowing for the transportation and delivery of goods on cross-border trade with Afghanistan.

43. The majority of households in this section are electrified directly, or indirectly through connections with neighbors. However, there is no billing for the use of electricity for domestic use. Electricity shortages are frequent. There is also an acute water shortage in the entire area. The population relies mostly on deep wells, which extract water from 300 feet below the ground, and the operation and maintenance of public wells is lacking. A total of four villages were selected for this study from this section. The total households in these villages are 3080 while the total population is 18,972.

c. **Section –C: Sheikwal to Torkham:**

44. The first 20 Km of the proposed transmission line in Pakistan (28% of the total line) is located in the Shinwari tribal area. The area has been relatively peaceful in recent years. The entire route of the proposed transmission line is barren hilly terrain. The majority of households are electrified directly, with the rest of the households connecting to the grid indirectly via their neighbors. While the local population does not pay for the use of electricity, the supply is subject to frequent outages.
45. There is acute water shortage in the entire area. Deep wells are the only water source but they require electricity to pump from 300-400 feet below surface. Many government-sponsored water supply schemes have failed due to recurring cost on operation and maintenance. Privately operated systems are working but for those who can afford them. A total of four villages were selected for this study from this Section. The total households listed in these villages are 4680 while the total population estimated around 23,400.

46. **Community Needs and Development Priorities.** Under the scoping study for Pakistan, separate focus group discussions were conducted with men and with women along the three sections of the COI. Both male and female respondents rated the secure and continued availability of electricity as their first priority and development need, followed by improved employment opportunities and improving access to drinking water as their third priority. Female respondents prioritized health facilities as their fourth priority, whereas for male respondents, education came as a fourth priority. All focus group participants also prioritized peace (women as their fifth priority and men as their seventh), arguing that peace would lead to improved cross-border trade and improve economic activities, thereby increasing employment opportunities for the local population.

VI. Benefit Sharing

47. **Introduction.** Globally, the development of large scale infrastructure has often come with significant social and environmental footprints at the local level. To address this distortion, and to contribute to sustainable development and poverty reduction both nationally and at the local level, large scale infrastructure projects have increasingly incorporated mechanisms to channel returns or promote investments in the locally impacted areas. Transmission line projects generally have a limited impact on local areas; construction phases typically last no more than a few weeks and the social and environmental impacts are typically easily contained. The CASA-1000 project’s social and environmental impacts are also expected to be easily managed with an appropriate framework and management plan. However, the length of the transmission line, the complexity of transecting four countries, and the delicate socio-political realities of the region provide an opportunity for the project to introduce mechanisms to engage local stakeholders and promote local development activities. The following section outlines the concepts of benefit sharing, drawing on global examples and best practices, and provides a set of recommended actions to mainstream benefit sharing under the proposed CASA 1000 investments.

48. **Benefit Sharing defined:** Benefit sharing lacks a universally accepted definition, but generally refers to “a commitment to channel some kind of returns—whether monetary or non-monetary—back to the range of designated participants: affected communities, source communities, or source nations.”

Under benefit sharing schemes, local stakeholders are made partners in the development of resources or infrastructure investments, and are entitled to certain benefits that accrue from the investments. Often, these agreements are between Governments, private developers or companies, and representatives of local stakeholder groups. Benefits can be monetary or non-monetary; monetary benefits include revenue streams, shares, or annuities that are channeled to local stakeholders, whereas non-monetary benefits include investments in local infrastructure or local development plans, socio-economic development projects, or even preferential employment or contracting schemes. The scope, nature, and duration of the agreements typically vary from project to project, but can often extend beyond construction phases into operation phases, where some portion of a revenue stream is continuously set aside to benefit local communities. Benefit sharing is used widely in projects with large social and environmental footprints at the local level, such as hydropower or mining. The CASA-1000 would represent a first step towards extending similar principles to transmission line projects.

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49. **Experiences with Benefit Sharing.** Benefit sharing, particularly monetary mechanisms, are relatively new, and, as such, the impacts on a development’s project outcomes are not entirely clear. However, many of the global experiences demonstrate that the introduction of benefit sharing mechanisms is often positive from all stakeholder perspectives. They allow project-affected people and local communities to become partners in projects, giving them a stronger voice in decisions that affect them, and an opportunity to be first among project beneficiaries, not last. From the government perspective, benefit sharing is a practical policy tool to achieve greater social inclusiveness and improve livelihoods of local people. From the perspective of private operators, benefit sharing promotes good community relations that reduce the risk of project delays. From the perspective of potential investors, realistic provisions for local benefit sharing mean that locally affected communities and the public are more likely to support the project, thereby reducing the investor’s exposure to risk.11

50. **Benefit Sharing Mechanisms:** Broadly speaking, benefit sharing mechanisms can be differentiated both by period of investment (e.g. construction versus post-construction) and by type of benefit (e.g. monetary versus non-monetary). Some types of interventions, such as community funds, or local grants or shares, offer monetary compensation to community groups to either manage locally, or are received at the household level. Monetary benefits are often preferred, as money is fungible, however, global practices have also shown that the distribution of these resources are often diverted locally, and there is a challenge to ensure the continued funding of these resources (e.g. community funds). On the other hand, several initiatives such as local employment or contracting, or the direct investments of the developer in socio-economic development are classified as non-monetary benefits. While there is no universal definition of benefit sharing, much of the literature and global practices highlight that benefit sharing should be focused on the construction and operation phases, as this provides the opportunity to effectively engage local beneficiaries as partners in the project and ensures the continued development of local areas. The table below outlines different phases and types of benefit sharing mechanisms.

<table>
<thead>
<tr>
<th>Phase/ Type</th>
<th>Construction</th>
<th>Construction &amp; Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monetary</td>
<td>• Local grants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Local area development fund</td>
<td>• Local Area Development Funds</td>
</tr>
<tr>
<td></td>
<td>• Annuities</td>
<td>• Local (Co-) Ownership</td>
</tr>
<tr>
<td></td>
<td>• Revenue sharing</td>
<td>• Indirect Social Benefits</td>
</tr>
<tr>
<td>Non-Monetary</td>
<td>• Socio-Economic Development of Affected Area</td>
<td>• Cost Bearing</td>
</tr>
<tr>
<td></td>
<td>• Preferential Employment</td>
<td>• Socio-Economic Development of Affected Area</td>
</tr>
<tr>
<td></td>
<td>• Preferential Contracting</td>
<td></td>
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</tbody>
</table>

51. **Benefit Sharing Examples.** Examples from World Bank financed projects have demonstrated the positive impact that benefit sharing interventions have on local communities, as well as the improved relationship between all stakeholders in the project. For example, the Government of Himachal Pradesh is developing a program of sustainable hydropower with World Bank support, under which small infrastructure facilities are being supported in affected villages through a benefit sharing program. Under this program, 1.5 percent of the project’s costs are deposited by the developers towards a Local Area Development Fund (LADF). To date, about Rs. 1.6 billion (US$33 million) has been deposited in these funds. In addition, non-monetary interventions have included investments in local schools and mobile

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health vans. These interventions were decided together with local community groups, based on the needs and priorities that were identified.

52. Global examples from hydropower projects offer good examples of benefit sharing with local regions. Norway’s Glomma-Lågen provides a good example of how benefit sharing obligations have been met through a combination of revenues to municipal authorities in the form of taxes, license fees and from owner incomes in the form of dividends. Taxes paid by the publicly owned power company amounted to US$71 million in 1998 – with 80% of this money returned to the region. These energy revenues accounted for 1.9% of the local municipal governments’ total income stream. The project also included measures to encourage local employment through preferential hiring during construction phases, in addition to the 2350 permanent positions required to operate and maintain the power stations and associated infrastructure. Brazil’s Itaipu dam also demonstrates a strong social and economic relationship with the local communities through royalties paid by the operator for the use of the Paraná River waters to produce electric power. In Brazil, the federal government redistributes some 40% of these monthly payments of about US$13 million among the various municipalities proportionally to the areas of their respective territories that have been lost to the reservoir. A similar amount is paid to the State of Paraná where the dam is physically located. This mechanism of redistributing part of the royalties levied on energy production to the affected municipalities is a simple and effective way to ensure that the administrations most affected by the project also receive most of the royalties. This ensures a continual flow of money, over the lifetime of the project (50 to 100 years of production). In addition to these significant royalties, Itaipú developed large scale environmental and social development programs. These programs have concentrated on activities such as reforestation, public health, reservoir fisheries, biodiversity conservation, and environmental monitoring activities.13

VII. Recommendations for CASA-1000

53. Introduction. South Asian and Central Asian countries stand to benefit significantly from the development of a regional market for energy. Upstream countries of the Kyrgyz Republic and Tajikistan could sell surplus summer energy to its downstream neighbors, filling a critical and growing demand in both Afghanistan and Pakistan. While not typical of transmission line projects, the proposed CASA-1000 has an opportunity to build on global best practices in other sectors to develop a benefit sharing framework under the project, to ensure that local communities and stakeholders are fully engaged and benefit from the proposed investments. The following section outlines some preliminary recommendations to national policy makers in all four countries as to the nature and scope of these potential arrangements.

54. Benefit sharing should extend beyond construction phase. While there is no universal understanding of benefit sharing, increasingly the focus on benefit sharing interventions extends beyond the construction phase to the operation phases as well. Given the socio-economic and political realities of the area, particularly in Afghanistan and Pakistan, the concurrence and support of local populations will be critical. Currently, the transmission line is expected to transect a significant portion of Afghanistan as well as the tribal areas of Pakistan to Peshawar. Construction phases will be short in duration, and will provide limited employment or other benefits to local communities. As such, it is recommended that the conception of benefit sharing under CASA-1000 should look at interventions that will extend for the project’s implementation period and beyond. Any monetary schemes should also be designed so as to continue beyond the project’s implementation.

13 Ibid.
55. **Financing benefit sharing in operating phases.** Extending benefit sharing through the operation phases of the transmission line will necessitate a continued stream of revenue to finance the agreed activities. During the construction phases, a benefit sharing scheme could be financed through agreements with private contractors as a precondition for construction. Given the current socio-economic and political realities, particularly in Afghanistan and Pakistan, this scheme is likely to generate good will and buy in from the local population that could serve to further secure the line during construction. During the operation phases of the project, the continued support to this scheme could be generated through marginal additionalities on tariffs, or through a designated revenue stream that would continue to fund local planning or priority developments. It is recommended that these options be thoroughly explored, so as to ensure the security of the transmission line during the operational phases of the project, but also to enhance sustainability and poverty reduction of the proposed investments.

56. **Benefit sharing should be implemented with local institutions.** The institutional realities differ widely between the four countries of the proposed CASA 1000 project. In all areas of the COI, local government capacity faces challenges, ranging from limited autonomy in the Kyrgyz Republic and Tajikistan, to virtually non-existent in Afghanistan and Pakistan. Over the past decade, the presence of non-governmental and community-based institutions has served as alternative implementing partners for development programs in the area. However, local government agencies remain an important stakeholder and partner in benefit sharing arrangements. Global experiences have shown that the integration of benefit sharing into local area development planning is often the most effective method for improved development, as this ensures full synchronization with ongoing planning. Within the COI of the proposed CASA 1000 project, a wide variety of community institutions were found to be in existence. As the locally elected institutions in Afghanistan, Community Development Councils have been established nearly across all COI communities. These CDCs are governed by the CDC by-laws, and have an important role in ensuring community priority projects are selected for implementation. In Pakistan, local tribal institutions, or jirgas, are universally present in the COI, and include an inclusive decision-making process over proposed community level interventions. The field report found that it is very important to explore the possibility of utilizing these community institutions and minimize the creation of new institutional structures especially when an existing community institution is well suited for supporting implementation and operation and maintenance of benefit sharing projects. Where community-level or local level institutions do not exist, it may be necessary to establish new institutions. This is particularly true if there will be a stream of revenues or monetary compensation flowing to community groups for local area development. In this, one field report recommended establishing a regional apex body to oversee the flow of funds to separate and auditable accounts with signatories from the community and local levels.

57. **Interventions should focus first on electricity and energy efficiency.** The scoping studies highlighted that the COI areas face problems with the reliable access to and continued supply of electricity. Since the proposed CASA-1000 project will invest in energy infrastructure, it is recommended that the first priority to be addressed under a benefit sharing intervention should be on improving access or reliability of electricity. This recommendation is based on the idea that benefits that first focus on electricity provision will better link the project’s developments of transmission infrastructure with the benefits at the community level. Where electricity provision is reliable, or is expected to be developed in the short term, then other community-based interventions could be funded through a ranking and prioritizing process. In addition, with the introduction of energy, either through on-grid or off grid measures, there will be an opportunity to discuss energy efficiency measures at the community level. This will help to introduce new behaviors that serve to conserve electricity, and improve energy efficiency at the household and community level. As a complement to the behavior based changes, small measures could be undertaken, such as the improved insulation of buildings, or
windows that could also help to reduce the costs of energy consumption. Initial discussions with community groups indicated a willingness to explore these different options.

58. **Accounting for Gender Differences.** Many studies show that women and men are impacted differently by development interventions, because of differences in responsibility, vulnerability, and capacity. Gender-based patterns of vulnerability are shaped by “the value of and entitlement to assets, access to financial services, education level, social networks and participation in local organizations”\(^\text{14}\)

In the COI of the proposed CASA-1000 project, investment impacts, as well as the needs and priorities will differ by gender. For example, in Pakistan, focus group discussions with women revealed that access to drinking water and sanitation was the number one priority for female respondents, although electricity was still ranked as a key priority overall. In addition, female literacy and participation in community-level decision making remained below that of males. These differences will need to be accounted for as the project moves forward, to ensure that improved outcomes from benefit sharing will benefit all stakeholders in an inclusive and sustainable fashion.