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**Evaluation Report
for
Alternative Development
Program (ADP)
Northern Region
by
USAID
in the
Islamic Republic of Afghanistan**

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**Afghanistan Services under Program and Project Offices
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ANNEX SET I. ACTIVITY SPECIFIC PROBLEM AREAS

1. Baharak Power Canal / Road / Micro hydro rehab
2. Colorado Beatle
3. Apricot Misrepresentation
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I. Overview / Executive Summary:

Weather, bad governance, endemic corruption, and human resource limitations make Badakhshan a very difficult project implementation environment. Economic and social infrastructure is largely lacking. Against this background, PADCO project accomplishments were considerable but with many negative aspects. The veterinary medicine program was outstanding; horticulture on the whole, good; and infrastructure creation / rehabilitation mixed. Substantial benefits are claimed by the contractor, some of which are contradicted by our findings. No project paper or even conceptual framework is in evidence. Accordingly, the project lacked a coherent framework. Without a clear concept to guide it, the project seems to have ultimately devolved into an oversized small project development fund, driven by local political expediency and short term AID metrics. The focus on institutional development, prominent in the initial project work plans – e.g., training -- appears to have been largely lost by project's end. A number of project design flaws inhibited implementation, as did excessive turnover of both COPs and CTOs. The quality of PADCO work was uneven, and at the end, shoddy.

Given the difficult environment, the delivery costs of the assistance provided was not unreasonable. Overall, the development impact appears positive – significantly so -- but localized. To achieve a sustainable systemic effect would have required a longer time horizon with either more resources or a narrower focus. However, given the climate-limited work year (≈ 7 months) and the projects limited operational time span (>3 years), the level of accomplishment was respectable. Since economic alternatives is a necessary but not sufficient condition to reduction of poppy cultivation, ADP's contribution to the sharp decline in Badakhshan poppy cultivation cannot be credibly segregated out from those of price movements, eradication, and interdiction programs. However, the consensus of knowledgeable opinion is that the ADP-N effect has been relatively small¹.

The evaluation team concludes that the activity was worthwhile. However, to reach this conclusion it is necessary to look beyond narrow, quantifiable economic benefit. These are estimated at some \$40+ million in present value², and do not, in themselves, justify the \$60 million ADP-N effort. Adding in more subjective elements – better personal mobility, exposure to new ideas and ways of thinking, improved nutrition, socio-political gains, objective evidence of USG concern, etc – provides a better perspective.

1.2 Design, Objectives, and setting: The ADP-N project³ was envisioned as a 4-year \$60 million effort aimed at reducing poppy cultivation by providing credible economic alternatives to vulnerable populations – i.e., the classic alternative livelihood concept. The ADP-N activity was imbedded within the framework of the larger, three component ADP activity, with separate (and substantially larger) components for the East and South. Though related, the ADP activities operated as distinct projects. The ADP-N contract award was made to PADCO in February of 2005. The focus was intentionally broad, encompassing a full range of rural development activities with presumptive anti-poppy

¹ Within the project's geographic areas, it is difficult to see any difference in trends between areas in which the project worked and those in which it did not.

² Based on an incomplete and statistically questionable data. See quantitative appendices.

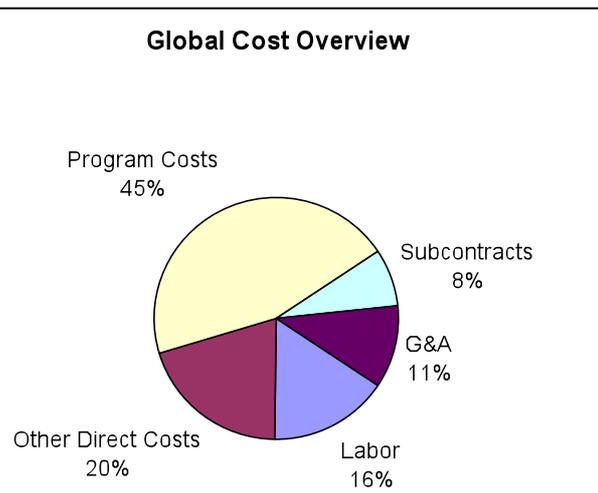
³ From February 06 until _____, the activity was known as the Alternative Livelihood Project – North (ALP-N). Irrespective of nomenclature, it was known throughout the project area as PADCO.

cultivation effect. The contract was awarded under MOBIS⁴ procedures. Cooperation and coordination with local authorities was to be of the essence of the activity. Badakhshan and Takhar – the project operational areas – are rural and poor, far removed from the more cosmopolitan Capital, and the more prosperous South. Activities were largely confined to three major valleys⁵, as the development potential elsewhere in the region was deemed insufficient to mount a program. Even so, rugged mountains and inadequate transportation infrastructure effectively fragment the program area into an array of segmented, semi-self-sufficient economic enclaves. Agriculture employs at least 80% of the population and accounts for the bulk of regional output. Mining, timber, and natural resource extraction are also important but of a distinctly lesser order of magnitude. Literacy rates are low, health statistics disturbing, and lack of human capital is a severe development constraint. Corruption and governance are further development impediments. Remoteness, terrain, transportation problems, and the conservative social structure are sufficiently problematic that not even the Soviet invasion significantly intruded on its more remote districts. PADCO had planned to cope with the lack of local knowledge, the lack of project support infrastructure, and the lack knowledgeable personnel by partnering with the Aga Khan Foundation (AKF) which had a strong presence in the North. Indeed, AKF helped develop PADCO’s winning proposals and was integral to its planned implementation. USAID effectively removed this option with its post-award reinterpretation of the MOBIS contracting rules.⁶

2.0 Budget Analysis

2.1 Cost Structure

In terms of its overall financial structure ADP-N looks much like any other USAID project. The ratio of program expenditures – the subproject activities actually delivering assistance -- to total cost is just under 1:1. A full listing of such activities is provided in appendix ___? Subproject tracking table. Value received is a different question, and varied considerable with the sub activity types. Accordingly it is best addressed in that context. In terms of accounting classifications, the accompanying chart provides a visual representation⁷. One notable difference from the usual USAID contract expenditure pattern was security expenditures. The bulk of



⁴ A GSA contract vehicle similar to AID IQCs but significantly more restrictive in scope. The authorities conveyed were reinterpreted several times with adverse effect on project operations.

⁵ Kishem, Baharak, and Faizabad Valleys

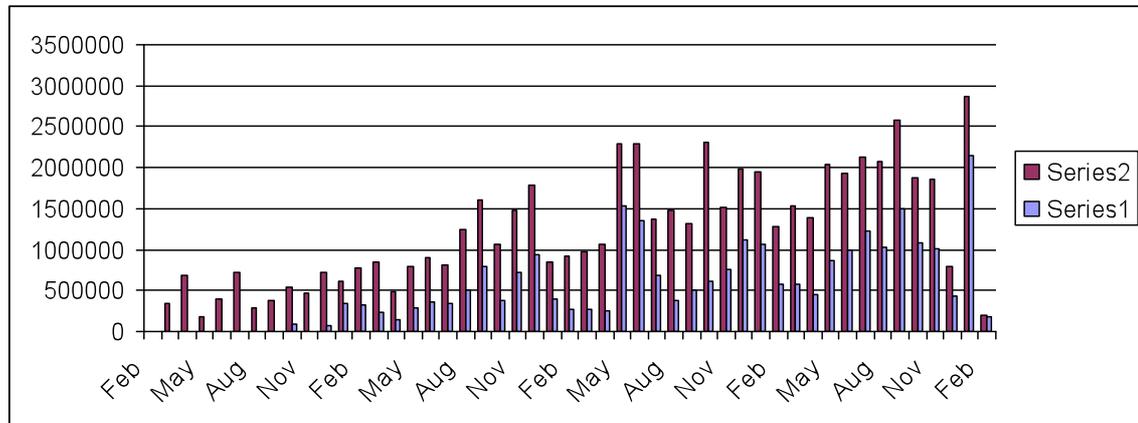
⁶ AID lawyers apparently reversed themselves and determined that MOBIS contracts could not convey sub-grant authority, or be used to establish financing facilities. While the AKH was happy to be a sub-grantee, it was understandably unwilling to be a subcontractor.

⁷ Total contract : \$60 mil

Program Expenditures:	<u>26.0 million</u>
Other Direct costs	11.7
Sub-contracts	4.5
General and Administrative	9.4
Labor	6.6

these are accounted for within a contract to the risk management firm “Hart”. These totaled \$580.5 million or roughly, 1% of overall expenditures⁸.

2.2 Burn Rate



Data source: USAID/A Comptroller

The higher column (series 1) above is the monthly overall expenditure. The lower column (series 2) is the monthly program (activity-level) expenditure. Both start with February of 2005 and end in February of 2008.

2.2.1 Operational expenditures

The project started off slowly with only very limited program expenditures for the first year -- reflecting a slow start to ground level assistance operations. Several factors would seem to account for this: (1) Badakhshan is a very difficult place to work (climate, human resources, transportation, etc.), (2) no region-specific development experience base, and (3) major changes in implementation parameters.

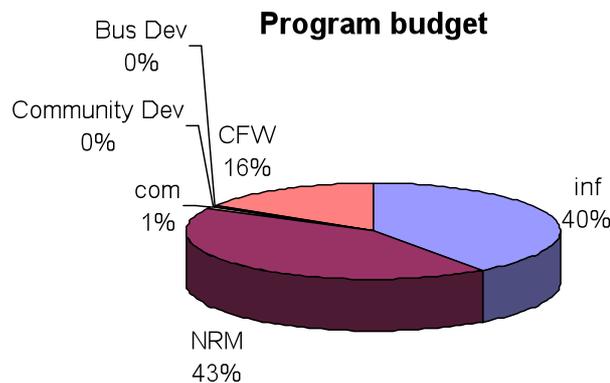
Even after program operations commenced in November of 2005, severe winter conditions limited operational activities until the following spring. Actual delivery of assistance (as opposed to planning and preparation) did not begin in seriousness until May of 2006, giving ADP-N an effective operational life of less than 3 years. Winters were a continuing problem -- more so than they should have been. It appears that the PADCO (USAID-derived) subproject design-approval-implementation cycle was 180 degrees out of sync with climate realities northern Afghanistan. Sub projects are conceptualized, designed, and approved in the spring-summer period, and implementation started in the fall. However, in Badakhshan, construction and agricultural work becomes difficult and largely ceases between November and May. Moreover, insufficient allowance was made for what is essentially a 7 or 8 month work year. These factors contributed to continuing problems in meeting targets. The pattern of expenditures suggests that the project activities were pursued even during the difficult winter periods. (One would have expected a greater peaking in the spring-fall and a relative decline in the winter months.) Compounding this, the contractor rushed a number of projects to

⁸ There are also other security related expenditures which could not be easily broken out. For example, the cost of two armored cars is included within the non-expendable property line item. The 35% danger pay (on top of the 35% post differential) for expatriates is also not included. However, the program budget, itself, is thought to be largely free of security expense items.

completion in the final months before closeout, despite unusually severe winter conditions which should have precluded work – leaving behind a legacy of uncorrected shoddy work. For the project as a whole and for many of its components, the time horizon was too short and the focus too broad to achieve meaningful lasting results on a broad front.

2.3 Activity Composition.

The PADCO project chose to categorize its \$23 million program operations under 6 categories: infrastructure (\$9.56 million), natural Resources Management (\$10.164 million), business development \$0.06 million) , cash for work (CFW \$3.80 million), communications (\$0.2 million), and community development(\$0.002 million), with the last two of minimal amount. The time pattern of expenditures suggests an increasing bias towards agriculture and a shift out of business development and institutional development. As environmental activities initially contemplated were dropped, NRM became entirely Agriculture.



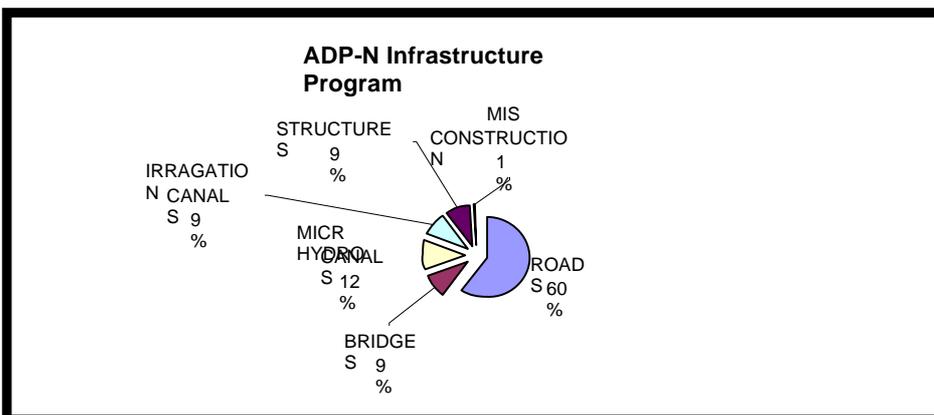
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3.0 Infrastructure

Infrastructure was dominated by road and bridge construction, together with canal construction/rehab these accounted for the bulk of expenditures. Structures, though of a lesser order of magnitude, are important. Of the \$0.8 mil expended for buildings and structures, \$0.7 went for veterinary clinic buildings and \$0.1 for root cellars. The former the team judged very worthwhile, not so the latter.

The evaluation team has serious reservations about the metrics used to guide and measure progress. A kilometer of road in distant rugged mountainous terrain is many times more demanding than that in front of the project’s offices. There is no such thing as a standard unit of road in Afghanistan’s rugged and varying terrain. It is similarly so with canals. In terms of the increase in irrigated hectares, minor equipment repairs can often be made



to seem the equivalent to major construction activities. The tightness of engineering supervision shows negative in the short term, but positive in the

long term, and is not captured in the metrics used.

Disturbingly, little thought to sustainability appears in evidence. Generally, infrastructure was created and then turned over to line government agencies, knowing full well that the ability to maintain the road, bridge, canal, building, power plant, etc. was largely absent. We found little attempt to strengthen cooperatives and to train their members, There is no evidence that PADCO sought to form water users associations, or other entities to manage and maintain infrastructure in the absence of government. Lastly, there did there appear to be much in the way of assistance for institutional development of public sector entities charged with oversight. Indeed there is much talk to the effect that contractors would bribe provincial or national government departments to take premature control of an activity so as to avoid having to make repairs to bring it up to project standards. Overall ADP infrastructure activities appear to have had a significant positive impact, but generally this was localized, and well below what would have been possible if supported by effective government follow-on. Without systemic effects, impact is best assessed from the effect of the individual interventions. We address it below in that fashion.

3.1 Roads and Bridges Roads constituted 60% of ADP-N infrastructure activity by cost, and bridges another 9%. Our analysis of the economic and social impact of the roads is detailed in appendix xx. In general the PADCO roads are of uneven quality. Some, e.g. the Baharak-Shohada are reasonably good; while others like the Baharak-Jurum are not. In general the roads leave much to be desired⁹, but the bridges seem quite well done. Asphaltting was a particular problem with many beneficiaries alleging sub-standard work or failure to do more than grading. With the exception of the new LBG Faizabad – Kishim Road now under construction, all roads we traveled – perhaps 8 or 900 km in all were in a state of disrepair. Travel times of 5 - 10 hours per 100 km are not at all unusual.

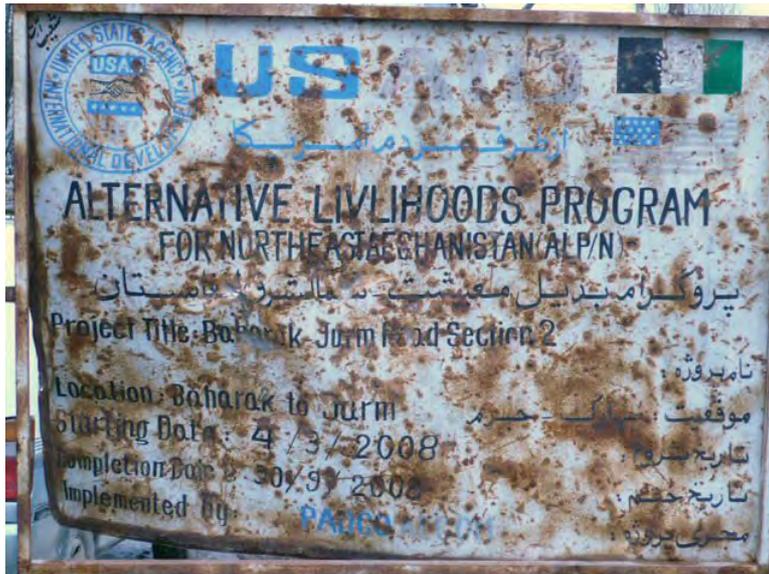


The PADCO-built roads, many of which are in mountainous areas, appear to be built to only to standards requiring high levels of repair. However, little maintenance is being done, beyond superficial cleaning up of the frequent landslides damage. In one case a nearly collapsed critical bridge (not PADCO-built, see insert) on the project's Baharak - Jurem road renders the road, itself in bad repair, unusable for its intended purpose: a major transit route for NE Afghanistan areas otherwise lacking market access transportation.

⁹ In most cases, roads were only graded and graveled, knowing that these would deteriorate seriously in one or two seasons. This can be deceptive in that construction on least one of these, the Faizabad Airport road, was limited to stop gap measures by USAID instruction, with later full rehabilitation planned as part of USAID's LBG highway construction program.

Because of the state of disrepair, roads in the PADCO area serve more of a social than economic purpose. True, goods do flow into, and to a lesser extent out of rural Badakhshan. However, perishable produce, particularly the easily damaged fruit that is the region's comparative advantage, cannot be economically transported on these roads. Sharp price differences within the region testify to the transportation barriers to internal trade. Further, our limited surveys, consistent with personal observation, suggest that traffic density on project roads is very light and largely limited to the movement of people.

Extrapolating (beyond statistical validity) from our very limited survey of two roads¹⁰ in the Baharak district of Badakhshan, we conclude that the \$_____ spent on roads and bridges by ADP-N



increased the value of economic output by some \$1.7 million per year, almost entirely through reduction of vehicle operating costs. Assuming a 7 year lifetime for the roads and \$_____ per km annual upkeep, this would generate an internal rate of return of 16%. Factoring in the clear social and political benefit, we judge these expenditures to be worthwhile. Were there to

be proper maintenance, systemic economic benefit for the region as a whole could be obtained. This, it appears, may require not only funding for road maintenance but comprehensive reform of the provincial and national entities charged with this responsibility. With respect to employment, the construction created some 5000 FTE jobs.

Lastly, it should be noted that the poor state of the PADCO-built roads reflects on USAID, particularly in that each is prominently branded with the AID logo on a billboard whose condition is illustrative of the state of the road.

3.2 Canals and related

3.2.1 Irrigation infrastructure

The project undertook to create, repair, or clean part or all of some 114 infrastructure elements related to irrigation.¹¹ Despite contractor performance problems, the rates of

¹⁰ Two roads: Baharak –Shohada and Baharak -Jurum

¹¹ In 2006 PADCO undertook spring cleaning on some 102 canals in Badakhshan and Tikhra Provinces. This was justified in terms of Food for Work stimulus to the local economy. For the most part, it just replaced the spring desilting normally done by the water users. This was not repeated in subsequent project years. Then work was undertaken on 12 other canals, of which the evaluation team visited 8. A few of them were for major construction or rehabilitation leading to increase in area irrigated, and the rest for improvements such as protection walls or re-designed intakes.

return calculated by the evaluation team are indeed impressive¹². By our calculations (extrapolated to all 114 discrete elements) project irrigation canal interventions, including flood protection, and related work should produce a net benefit of over \$3 million in each of their 7 years of presumptive useful life; this at a capital cost of \$2.96 million. The internal rate of return (IRR) is impressive -- some 98%. In one year it should be possible to generate an incremental return sufficient to pay for the work. Some of this work could have, perhaps even would have, been done by the farmers themselves but the effort would not have been systematic, would have taken much longer, and would not have benefited from professional engineering oversight. Unfortunately, institutional development directed at sustainability was neglected¹³. No credible data is available from which to calculate the FTE equivalent.

¹² The serious conceptual problems in estimating the output impact, given the way project data was compiled; nonetheless even allowing for this the results are clearly quite good.

¹³ There was no effort to organize water user associations (now required according to government policy), or to train the mirabs (local water masters) in management and maintenance, or to train the farmers in on-farm water management.



3.2.2 Hydroelectric Canals

Power canals are a different story. A particularly egregious example of bad work and bad faith is the Baharak Power Canal and associated road (picture at left shows breach in Baharak canal).¹⁴ The canal failed to deliver water to the power plant and irrigation fields downstream. The walls collapsed when seasonal floods and seepage eroded unlined canal banks soon after completion. It's hard to

place a value on power canals but unless the work on the Baharak canal is redone it will have over \$ one million in costs and no benefit whatsoever. Indeed the benefit is negative since canal construction has taken land and houses and threatens the road below. The other power canal –The Faizabad power canal was a failure of a lesser order. Both had been preceded by a costly \$560,000 Winrock technical study of hydroelectric potential in Badakhshan. This study could have been useful to the government and/or to the donor/ngo community active in micro hydro power, but was never made available – an inexplicable waste that could yet be corrected.

3.3 Buildings and other Structures

Three types of buildings were constructed. Veterinary clinic facilities by most reports were well suited to their purpose – only one out of thirty is not now in use. However, in several cases the solar power system was not in evidence. The root cellars are not appreciated by farmers who think that they have design flaws they see as conducive to fungus. Of the 6 visited, only only 2 are are in use. The training facility – used once as such -- now appears to be a guest house / residence. Benefit calculations are included within the related NRM component analysis.

4.0 Natural Resource Management (NRM)

ADP-N built its \$10 million.

NRM (read Agriculture) program around 3 principal components:

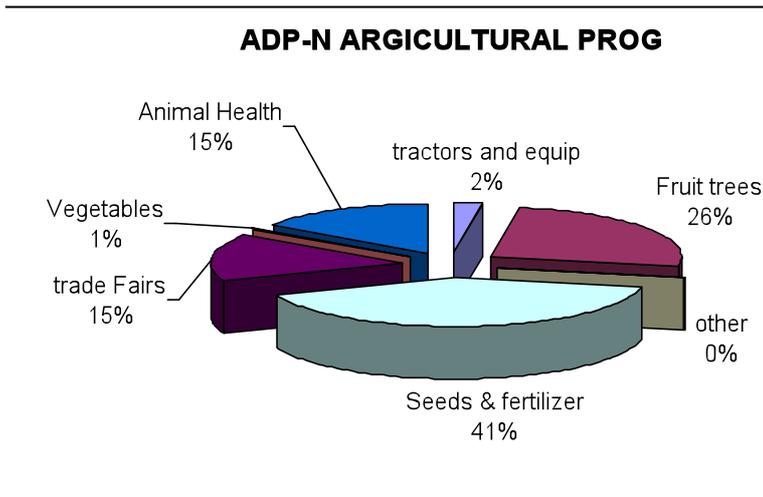
¹⁴ See appendix ? “The Baharak Road and Power Canal – An embarrassment to USAID

Seeds and fertilizer: \$4.1 million
 Fruit Trees: \$2.6 million
 Animal health: \$1.5 million
 Other \$3.9 million

Technical assistance is built into each component. Indeed the most successful of these activities – animal health or Veterinary training is entirely TA. With respect to the other elements, the evaluation team believes that the TA component of each declined over time, and by projects end, the activity was driven by the commodity delivery metrics with insufficient regard for training, institutional development, and sustainability.

As with infrastructure, the evaluation team found the quantitative indicators used deceptive. For example the number of saplings distributed is at best ambiguous as to the level of effort involved, and if the variety is inappropriate to the area

this may not be know until after the first fruiting some 4 or 5 years later.



4.1 Vegetables

Vegetables are high-valued, labor-intensive, and relatively water-efficient. Presumptively, (if a market could be developed) they should have the high poppy-substitution potential, and accordingly were focused on by ADP-N. Moreover, yields are abysmally low, even by Afghan standards -- providing opportunities for rapid productivity gains through improved seed and increased fertilizer application. The project followed such a strategy, using cooperatives to distribute improved seed and fertilizer – both heavily subsidized. Overall this sub activity was quite successful yielding a cost-benefit ratio around 1:5 with a net benefit of nearly \$10 million against program costs of \$1.8. We estimate that some 55,000 FTE jobs were required to support the increased production. However, much of the employment impact was likely accounted for through reduction in farm-level underemployment with farmers working additional hours. It should be noted, however, that some crops were serious economic disappointments to individual farmers owing to minimal technical assistance and lack of local field testing¹⁵ before introduction. While the potential gains from vegetables have now been demonstrated to farmers, many of the project beneficiaries – absent the project's presence -- appear to be reverting back to traditional varieties and cultivation

¹⁵ Project personnel allege that USAID specifically forbid field testing of new varieties. They were told that there's was not a research project – just get the seeds out. Nonetheless PADCO regarded field testing as critical and managed to do a considerable amount, labeling it demonstration fields. USAID also reportedly demanded that PADCO start a program to shrink rap vegetables as was being done in the East.

practices. These may have considerably less potential gain, but also engender far less downside risk – and near subsistence level farmers are understandably risk-averse.

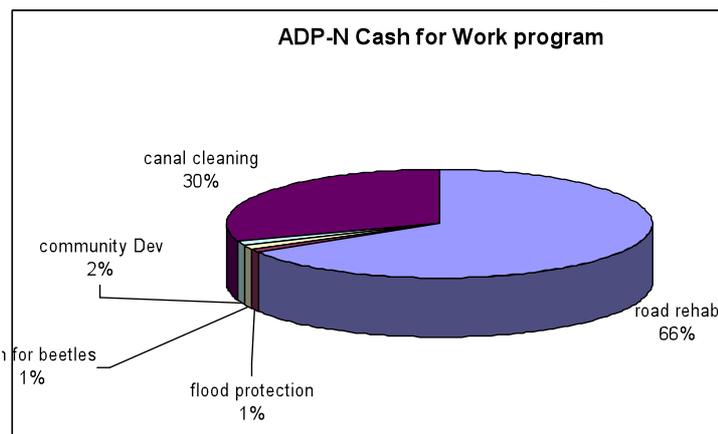
4.2 Grains and Cereals

Winter wheat seed and correct proportions of DAP and urea fertilizer was distributed in kits directly to 3500 farmers in the 12 cooperatives selected for direct assistance in the Project. Farmers were to pay 40-50% of the cost back to the cooperatives, and this was found to be largely achieved. Also the Project provided these kits to the Department of Cooperatives for distribution through 166 cooperatives, to 14,000 farmers in the fall of 2006 and 15,000 in the fall of 2007. But there is no record of results or of payment by farmers to these cooperatives. We were advised by former PADCO personnel that provision of seeds and fertilizer to cooperatives was to some extent an attempt to help capitalize cooperatives and to compensate for the loss of project financing facility authority which could have been used to support their development.

In our surveys everywhere farmers say that this seed gave some 25-30 more yield than local varieties, and in addition gave abundant straw—which is almost as valuable as the wheat grain—and that farmers are continuing to reproduce and plant these new wheat varieties, so this is a significant sustainable achievement of the Project. The main complaint is that there was only enough for one half jerib (1/10 ha) or less for each farmer.

4.3 Fruit Trees

PADCO and its subcontractor, Roots of Peace (RoP) spent some \$5.5 over roughly 1½ years on the horticulture sector, which was seen a credible high return alternative to poppy cultivation. The two key components were: nurseries and Orchards. As is shown in appendix xx [insert title] the project’s estimated returns are based on flawed methodology and grossly inflated. Nonetheless, our calculations and extrapolations, based on project data adjusted by parameters estimated from our field surveys forecast high returns – an internal rate of return in the neighborhood of 20%. Since the gestation period for horticultural investment is 4 or more years, the gains are thus far notional. In terms of cost/benefit ratios, the present value of the project’s costs to that of its financial returns is estimated at : _____ ; and the annual stream of net income to orchard and nursery owners should be some _____ dollars by year 7 [insert whatever year makes the most sense]. We estimate that some 7000 FTE jobs will be permanently created due to project activities – 5120 in orchards, and _____ in nurseries.



Generally, apricot, peach, apple, cherry, and walnut activities have had the most success, or at least have been most appreciated by the growers. However, the overall effort has

not been without problems. Inadequate training has substantially reduced the yield from walnuts where budding technique were not well communicated to farmers. Similarly, insufficient training in pruning has permanently reduced yields in fruit crops. Irrigation changes required for non-traditional rootstock were poorly understood. Most distressing was the misrepresentation of apricot sapling varieties which resulted in farmers stating the intention of pulling up a substantial portion of saplings after a number of years of growth¹⁶. It should also be noted that as with many PADCO activities, coordination was selective. Training for cooperatives and greater involvement of MAIL could have help disseminate techniques and promote greater sustainability. Appendix __ details our findings, methodology, and calculations.

4.5 Animal Health

The evaluation team estimates the PADCO animal health program implemented by the Dutch Committee for Afghanistan (DCA) yields a 20% internal rate of return and has made a material difference in the lives and incomes of livestock producers in the 15 targeted districts. There were three components to the PADCO effort: (1) provision of veterinary services especially those pertaining to vaccinations and treatment of common diseases, (2) building public sector capacity to diagnose and manage disease outbreaks, and (3) improvement of animal nutrition and husbandry. Some \$1.5 million was expended on these. Supporting this activity, veterinary clinics and a government laboratory¹⁷ were built and provisioned under the infrastructure component of ADP-N at a cost of just under \$700,000. Total expenditure directed at animal health was \$2.2 million.

The DCA has long been working on animal health programs in Afghanistan. Under PADCO, they trained veterinary workers; organized a village-level animal health effort; and established 32 animal clinics know as veterinary field units (VFUs). We calculate that the hitherto absent veterinary services should provide livestock producers a net benefit of \$5 million were with respect to the treated animals. More importantly, the veterinary services program has self-financing elements – farmers fully realize the value of such services and are charged a sufficient fee to cover marginal cost. With minimal funding – for local supervisory and oversight salaries – this level of benefit can be sustained on an annual basis indefinitely. To ensure long term impact, DCA, continues work even after USAID discontinued funding. Currently they are creating a market-based supply channel for quality medicines at reasonable prices, a critical component to any long term effort. We believe they should be commended for an exemplary program.

To derive net return information, the team worked with DCA data, compiled by DCA staff over a number of years, commencing well before the ADP activity. We used a survey of key informants to estimate or adjust key parameter relating to composition, age distribution, mortality, and health in the target animal population. These were then

¹⁶ Farmers/nursery owners were provided apricot saplings reportedly of the highly desired (locally) Quasy variety. However, at first fruiting it became apparent that this was not so, and that the pit of the fruit was bitter. The pit in Afghanistan is ground up and chewed and is a valued part of the fruit, seedlings of plants with bitter pits command a far lower price. The flesh of the fruit is quite good, so despite the obvious disappointment and the long life of the plant, we doubt that farmers will actually destroy many of the trees.

¹⁷ The government laboratory has all but ceased to function owing to the lack of MAIL resources, and the Ministry's reallocation of the vehicle provide to the lab veterinarian for outreach.

incorporated into dynamic herd model to assess net present benefit with respect to the presumptive (pre-project) control group. 18 An alternative (to PADCO's) methodology was then developed to quantify and value the improved state of animal health. The value of the animals was calculated at Faizabad market prices, and undervalues some farm use animal products such as wool, but includes milk & yogurt. In terms of employment, impact of reduced mortality/morbidity and consequent larger herds would largely be against underemployment. Converting this to full time equivalent (FTE) jobs does not appear meaningful; but for the record applying coefficients from an East African study to the number of animals saved by the DCA veterinary program suggests that 4674 FTE annual jobs might be created while these higher animal populations are sustained.

4.6 Cross-Cutting Agricultural / NRM Issues

4.6.1 Pesticides and Safety. Safety issues do not appear to have been a major problem for PADCO or project beneficiaries. Project reports indicate that PADCO studied relevant pesticide issues, and then followed US technical guidelines. A former PADCO home office manager stated that during the last year of the project ADP-N employed an IPM specialist at their Fruits and Nuts person. Limited amounts of EPA approved pesticides were purchased and some of this was sprayed by or under the direction of ICARDA to control the Colorado beetle. Moreover, to reduce the need for spraying, a program of mechanical removal of the beetles¹⁹ preceded use of insecticide. There were no reports of sickness or adverse reaction from the spraying. Other use of project procured pesticide seems to have occasioned no memorable safety or environmental problems. See annex xx – program problems – for a discussion of the beetle problem.

4.6.2 Environmental Protection. The evaluation team found no sub-activities directly concerned with environmental protection – with the possible exception of flood and erosion control. Serious degradation of watershed areas through deforestation is in process, yet no project activities were directed in this area. Work in this area was initially envisioned, but none apparently took place.

5.0 Cash for Work. Cash for work was intended to (1) inject income into poor communities, (2) provide a source of employment, albeit temporary, (3) create or rehabilitate needed social and economic infrastructure, and (4) disrupt the labor supply for poppy cultivation/harvesting. Individuals, chosen by village shura were given modest salaries (usually \$5 per day for unskilled labor without a donkey) for a limited time. The bulk of the work was related to road and canal upkeep. Surprisingly few problems were encountered, useful work was accomplished, income was generated and directed to low income recipients, and the images of both PADCO and USAID were enhanced. The program was particularly valuable to PADCO in that the strong desire by communities for the program ensured community-level access and receptivity to other project activities. The only negative may be in the paying of people to do what was, in

¹⁸ . The coefficients used in ADP-N's benefit calculations were derived from other regions in Afghanistan and are not necessarily accurate.

¹⁹ Under the "cash for work" activity, a "cash for beetles" sub-subproject was initiated in Kishim and Baharak. This paid a reported \$5 dollars for each bottle of (approximately 1,000) beetles collected. Some 3,000 bottles were collected in the Baharak district alone and local authorities stated that they consider this a very successful PADCO activity. Women and children did the bulk of the collecting and, lacking other sources of income, they too were well pleased.

some cases, traditionally local community obligation work. Over the project's life, CFW injected nearly \$4 million into rural communities, provided almost 4,000 work years of FTE employment, cleaned/repaired ____ kilometers of canals, and built ___ km of rural (tertiary) roads. No serious problems were noted.

6.0 Women's Programs. In terms of explicit programming, only some ___ was expended. This consisted largely of vegetable gardens, tree nurseries, poultry promotion and handicraft fairs.. These are considered worthwhile and effective, if limited, programs. Solar drying, canopy vegetable production, and agricultural produce and processing directed activities proved initially successful. However absent effective sustainability mechanisms, benefits have not spread beyond the initial beneficiaries – and the woman's produce and handicraft fairs were discontinued when the project ended. A positive but localized impact on woman's income was obtained. Concern for woman's issues appears to have been incorporated throughout the PADCO portfolio – specific provision for women was included in CFW, in the training of veterinary field workers, their use in CFW projects and in other activities. The Director of Woman's Affairs for the Province of Badakhshan found PADCO people interested in an alert to woman's needs (though she decried the limited level of resources devoted to support her offices proposals. A more detailed exposition of woman-oriented programming can be found in Annex ____.

7.0 Business Development (BD). PADCO focused on Agribusiness as the enterprise area with the most potential. There are three major components to the project's agribusiness sub-sector activities – feedlot, walnut processing and potato seed production and marketing. The feed lots demonstrated weight gains of up to 10% over control animals. . The project has imparted basic skills of improved animal husbandry that can be replicated by individual farmers

Walnut is by far the most significant high-value commodity produced in central Badakhshan. ADP/N supported a private company in Shohada district by constructing a warehouse for collection and processing of walnuts. The attributed increase in net sales value for 2007 to 2009 is estimated at US\$1.75M (equivalent to NPV of US\$1.29M) and a benefit- cost ratio of 1:2.5. The company once had a workforce of 130 women processing walnut, but has since shifted much of its production to Kabul.

The ADP-N potato seed multiplication scheme involved planting some 80 metric ton of improved seed in Baharak district. Managed by ICARDA, it produced 724 tons potato within the investment year of which some 41% was seed and the remaining 59% ware. Project yields were at least twice more than the local variety, fell back to previous levels in subsequent years. The project attributed output has a net present value of US\$412,560 with a benefit cost ratio of 1:1.1 when "second round" benefits are added. The project has constructed 15 root cellars to store seed in the winter and cleared potato fields of Colorado beetle using mechanical methods, augmented with chemical sprays but the threat of the disease remains widespread. Sustainability beyond the fourth year is questionable because the value chains were never developed beyond the farm level. Assuming 174 man-days per hectare of work, the project has generated 26 FTE jobs over four years.

The evaluation team found that project interventions were entirely on the supply side; and were narrowly focused on specific activities rather than demand and the value chains in which they are (or should be) embedded. Further, no competitiveness analysis or market surveys were done to establish an area of commercial advantage; nor is there any evidence of marketing or product promotion. Training activities were inadequate. Lastly,

small grant and financing facilities envisioned in the original project terms were developed owing to USAID interpretation of the MOBIS contracting rules. It also appears that, over time, the project focus turned away from business development, possibly as a result of moving the project away from an EG mission backstop to a agricultural office backstop.

PADCO also sought to provide IT training in support of business development but we found no evidence of residual impact. The activities aimed at developing internet access and radio programming (to convey market prices, business information, and technological innovation)²⁰ and were defunded and never commenced

A farm stores activity was initiated and for a limited time provided quality agricultural inputs and subsidized prices – reportedly about 40% below market prices. The effort failed when PADCO support ceased. Agricultural fairs sponsored by the project weresuccessful by most measures, but lacked sustainability in the absence of project organizational and financial resources.

We conclude that the business development subcomponent demonstrated the potential for profitable agribusiness activity – particularly which related to walnuts and dried fruit -- but did little to actually establish such activity.

8.0 Quantitative Impact Summary Table

CAVEAT EMPTOR -- these estimates reflect the application sophisticate methodological techniques to defective data. Accordingly, these estimates are incomplete and, at best, illustrative. To the extent practical, the estimates were derived independently from those offered by the ADP-N contractor, and are done to a higher standard. To tailor the analysis to the project area, small scale surveys commissioned by the evaluation team were used to estimate key parameters which were then applied against base data. Size and other factors limit the statistical reliability of the sample data. For some interventions no estimate of benefit is given, in these the complexity of interactions and/or the lack of suitable data prevented any meaningful calculations. In all cases, secondary and tertiary effects are not dealt with, nor are any shadow prices used. Accordingly these estimations do not capture the social benefit of the various programs (e.g., use of roads for personal mobility, impact on household nutrition, the political and stability effects, the reduction of poppy cultivation, the impetus towards modernization, etc.).

Sub-sector	Net Income US\$ (Discounted)	Annual FTE Jobs ³	IRR (%)	Project Cost	B/C Ratio ¹	Remark
1. Rural Roads 183.5km roads rehab.	1,798,044 (85% reduction in vehicle operating cost)	5,088 (CFW)	16%	7,300,000.0	0.11	\$9810/km

²⁰ The team is puzzled by the defunding of media usage – as are ex-project personnel – in that farmers valued the service; and it provided extended outreach to the project which could have been used to not only to convey TA but also to combat rumors blaming PADCO for the introduction of the Colorado potato beetle.

2. Irrigation 24,420ha affected of which 1,067ha new land	9,253,518	N/A	98%	2,959,269.0	0.53	\$378/ha
3. Veterinary 15 districts, 32 VFUs 634,736 cattle, sheep, and goats vaccinated 2,301 equines treated	3,576,187	4,674	Very high ²	1,498,606	3.7	\$238,413 \$112/household \$172/VFU
4. Fruits and Nuts 4.1 Nurseries (91 established in 7 locations)	50,389	N/A	Earning from sale of saplings			
4.2 Orchards 4.3 Poplar trees	4,973,778 552,294	5,120	12%	2,412,615		Projection \$398,950/ha (\$18/tree)
5. Vegetables	8,724,990	54,791	Very high	1,700,000	4.3	
6. Wheat	6,870,098	280	Very high	960,000	8.0	
7. Agribusiness A. Feedlots B. Walnut Processing C. Potato Seed Multiplication C.1. Cash-for Bettle C.2. Seed/Ware	9,364 1,288,815 352,980 5,781 347,199	N/A N/A 26	N/A Very high 45%	706,244 40,000 412,560	0.63 2.5 1.1	
TOTAL	37,450,457.0	69,979		17,989,294		

[1] Both NPV and B/C ratios are in most cases imputed by aggregating capital expenditures and fixed and variable costs

[2] By convention an IRR above 50% is treated very high; [3] FTE annual jobs are for incremental benefits only.

[4] Cost does not include \$25,825 expended for cellars; refers to cash-for bettle and seed and fertiliser only.

9.0. Poppies, the Alternative Livelihood Concept, ADP, and Badakhshan.

By the authoritative UNODC Field Survey²¹, poppy cultivation in Badakhshan fell sharply in the last two years, dropping to negligible levels in 2009. A number of credible explanations have been offered:

(1) A classic agricultural production boom-bust cycle. Oversupply engendered a sharp decline in the price of opium paste at farm levels. In Faizabad the Provincial Counter narcotics officer states that the price fell from \$124 per kilo in 2007 to \$24 per kilo in 2009. The same timeframe occasioned a nearly equally sharp rise in the price of alternative crops -- wheat and in animal fodder. Reduced poppy cultivation can be seen as a predictable response to price movements, with lower cost production in the south crowding out the higher cost northern product.

(2) Reaction to animal feed crisis in 2008. The winter of 2008 was unusually severe. . When snow closes the passes, money has far less immediate value. Animal fodder was difficult to procure, even if one had (poppy derived) funds, and many farm animals starved. Economically (and culturally) loss of herds is devastating to small farmers. The (over) reaction was to move forcefully back into wheat and fodder generating crops. This limits the downside loss, and most farmers in Badakhshan are in no position to take risk even for large potential rewards.

(3) Reduction of threat to transit and processing trade. In recent years the processing of poppies and the transshipment of opiate from the south to (the Russian Mafia in) Tajikistan has come to dominate illicit activity in Badakhshan. The US CN advisor in Faizabad believes that the corrupt political and police establishment see poppy cultivation as a threat to their more lucrative activities. By suppressing cultivation, less attention is attracted to the area; and if all agree that the authorities are doing a good job at suppressing cultivation, additional CN resources are less likely to be sent to the region where they could be disruptive of labs and transport operations.

(5) The balloon squeeze effect. Production migrates around the country according to the relative level of CN pressure.

(6) Poppies are a religiously objectionable crop to devout Muslims. The North is a very conservative and religious area. Besides, poppy cultivation can be dangerous, and there is always the risk of eradication. Offered economic alternatives, the people will opt for them. The ADP creation of economic infrastructure assists, as does the smaller but more poppy-specific assistance under the GPI.²²

The evaluation team is of the opinion that all 6 factors are operative and account for the bulk of suppression. We have ordered the factors according to our view of their

²¹ An aerial survey with ground truthing.

²² Of note the Badakhshan Province CN director complained bitterly about the failure of PADCO to directly link its activities to the CN effort. Farmers, in his view, believe they have an understanding with the government and the international community – if they don't grow poppies they'll get aid. When ADP assistance is not explicitly linked, farmers do not see the connection and feel morally relieved of their part of the implicit bargain.

proportionate effect on poppy cultivations. We have no basis to do more than an ordinal ranking of the CN factors at hand.

One further note: with declines in cultivation, poppy production moves further off-road. ADP activities were focused on where the development potential was – and that is where the roads are. Accordingly one presumes that CN impact lessens disproportionately to reduction in cultivation.

10.0 Problem Areas, Program Impediments, and Lessons Learned

Over time PADCO developed a rather negative image among government counterparts, beneficiaries, and assistance delivery peers. Criticism centers on: (1) its heavy security footprint and high costs; its inconsistent coordination and lack of transparency; and in the final months of the project, shoddy work. This need not have been. In addition USAID was quite critical of delays in start-up and PADCO failure to meet targets.

10.1 Security footprint and lifestyle. The residents of Badakhshan in general and Faizabad in particular found the high security profile of PADCO somewhat intimidating. It offended their sense of the province as a secure and peaceful area²³. Worse still, they saw it as a costly diversion of resources that were intended to help them. Compounding the image problem was the explicitly western standard of living by PADCO expats, again seen as a waste of resources intended for them. At the same time the Aga Khan Foundation and other NGOs (now including IDEA_NEW, a PADCO successor) were able to operate effectively with unarmed guards, an a low lifestyle footprint. Indeed the NGO community was trying to combat latent hostility by projecting a distinctly non-military posture of openness and friendliness. PADCO behavior was seen as discordant to that effort. PADCO was also faulted for driving up rents and salaries.

Lesson learned: It is possible to successfully operate with a small security and lifestyle footprints in Badakhshan. Mercy Corps seems to be so doing, and in the process receiving a greater level of cooperation from Government, communities, and other NGOs. By not engendering unnecessary envy, aversion, and hostility MC has – by all reports -- rendered its development assistance more effective.

10.2 Coordination. Among Provincial government officials there is widespread criticism of PADCO's lack of coordination, and in the minds of some, arrogance. The province's executive director (head of the Provincial Development Council and, (in effect, the governor's chief of staff) believes that PADCO coordination was erratic at best. He found PADCO often absented themselves from important PDC coordination meetings. PDC procedures were tightened about 2 years ago when a new governor was appointed. The Executive Director believes PADCO never adjusted to the new

²³ The police chief of Baharak district asked what they were afraid of, pointing out that not a shot had been fired in his district in over a year,. A local arbob added that 5000 Russians were not even able to enter the district. However, one needs to remember that PADCO had two employees killed early in the project and that the AKF compound still contains burn-out vehicles from a mob attack over a year ago

procedures. In his view, their coordination consisted of cherry-picking among communities and line agencies to get nominal buy-in for whatever they wanted to do.

The Director of Water Management says that not only didn't they coordinate with him; they refused to leave blueprints, specifications, or any record of what they had done for projects within his jurisdiction. The Director of Public Works claims they ignored his department, despite its obvious jurisdiction over many PADCO activities. The Director of Counter Narcotics found PADCO "useless" for his purposes. He believes they deliberately distanced themselves from the counternarcotics effort and his program suffered as a consequence. By contrast the Director of Agriculture and to a lesser extent the Director of Women's affairs, were pleased with PADCO coordination. At the community level, shuras and district officials who benefited from well-done projects (as most were) generally praised PADCO, while those who received no aid, or badly done projects bitterly condemned the company, usually for not coordinating with them.

A number of points need to be made here. There is serious in-fighting among the provincial line agencies for influence over assistance activities. Partly this is to help supplement their meager budgets to service needs, and part may be to position themselves for rent-seeking opportunities. In any event all are demanding greater coordination (read control over project resources). It appears to the evaluation team that PADCO may have been caught-up in political maneuvering between the PDC (a provincial government entity and some of the national government line agencies in the province (MAIL, MRRD, ... to whom many of the provincial level office directors reported. Most evident was the bitterness over the allocation of project equipment given to the provincial government when the project closed. The executive director made the allocation, less favored departments got nothing. (See appendix ___)

The PDC process itself is quite political. With regard to communities, those that did not receive anything blamed PADCO, where in truth it was the government and the PDC that largely determined which areas were favored. In theory communities petition the governor who refers the request to the PDC which consults with line agencies and then seeks donor provision of the needed activity. The governor, district governors, legislators, national and local politicians, all have an interest in directing assistance to favored groups and taking the credit. The provincial line agencies intrude on the process. As elections approach the process can become dysfunctional. Moreover, some targets of opportunity need to be addressed more rapidly than the PDC process would allow.

Some line agencies complain that were not coordinated with nor apprized of the specifications on work performed within areas of their jurisdiction. The last COP for PADCO disputes this. He points out that line agencies generally signed off in advance, that there is no culture of coordination here, and that no one files anything. At PDC meetings he could be coordinating with someone who would nod his head in acceptance and take a copy of the proposal, but for lack of interest (nothing in it for him personally) or lack of language skills, would remember nothing of the conversation and would promptly trash the document. A different former COP notes that the governor regarded PADCO as his personal public works program and that the USAID American CTO consistently overruled him with regard to the Governor's pet projects. Undoubtedly much of this is true, and other foreign attendees at the PDC meetings found PADCO

presentations credible. But it does nothing to explain, it does not explain the failure to disseminate technical studies of use to other donors²⁴.

Lessons learned: Unrequited coordination is not inherent in the local culture. Even where project management demands it from employees, it will not happen without command emphasis. Mechanisms need to be designed into project to force a reasonable level of cooperation and, **equally important to protect against unreasonable demands made in the name of cooperation.** A hands-on USAID management approach is called for -- it is neither fair nor wise to place field coordination responsibility entirely with a contractor.

10.3 The Sub project activity cycle. Generally USAID strives for an 18 month pipeline. This allows for an orderly process. In the case of Afghanistan there was substantial pressure to raise the activity thru-put level and the pipeline fell to 9 months. Perhaps in consequence of USAID's own funding and approval cycle, project activities were conceptualized, designed, and approved starting in late spring and extending through the summer. Implementation often commenced in the fall. This is 180 degrees out of phase with the harsh winters in Northern Afghanistan. Design approval work could best be done in the winter when construction and agriculture were nearly paralyzed, and implementation should start in the spring while it had 6 or 7 months of good weather for completion. This may be one of the sources of the persistent failure of PADCO to meet USAID expectations. Related to this, one should expect a one year project in temperate areas to be a 2+ year project where the effective work year is only 6 or 7 months long.

Lesson learned / recommendation: Adjust the project cycle and time duration to mesh with climatic and geographic realities.

10.4 Sustainability: Much of the work done by ADP-N will have no long term consequences. It would have been better to do less, but endow what was done with more staying power.

Lesson learned: Focus more on institutional development, even though it does not yield the quick gains USAID metrics strive to capture.

10.5 Care in introducing new varieties: Farmers are critical of PADCO's practice of not field testing imported, improved varieties before distribution of seed. This has caused unnecessary hardship to individual farmers and undermined project credibility. Cucumbers, radishes, carrots and onions are cases in point. The team also heard, and substantiated complaints that farmers were misled as to the variety of apricot saplings provide – discovering that it was inappropriate only after three years of growth. Lastly, farmers, probably erroneously, blame PADCO for the introduction of the destructive Colorado beetle.

Lesson learned: Locally field test new agricultural varieties for appropriateness before distributing them. Take special care with regard to introducing exotic pests. Note: This, of course, slows momentum and must be allowed for in AID project performance metrics.

²⁴ Case in point: PADCO commissioned a three quarters of a million dollar study [check amount] by WINROCK of hydroelectric potential a /in _____. It was never used by PADCO and no one else ever heard of it.

10.6 Duration and Focus: the project was designed with too short a time span and too broad a focus accomplishes its stated ends.

Lesson Learned: Don't confuse long term sustainable development work with short-term high, but time-limited high impact work.

10.6 Close-Out Problems: By any measure the ADP close-out was badly done. Decisions were made without full understanding of consequences. The hurried departure of the contractor left behind a legacy of shoddy work²⁵ rushed to completion under unusually harsh winter conditions. Even though a follow-on project IDEA-NEW was under development much valuable equipment needed for the new activity was turn-over to government entities and appears to be used in sub-optimal. The decision not to extend the PADCO contract had consequences that should have been foreseen, and that could have been mitigated. We would also note that the USDH field program officer was withdrawn from Faizabad during the last 6 months of the activity; this, despite the knowledge that lack of such a presence had been a contributing factor to initial project problems. The locally-based FSN USAID engineer (given full CTO responsibility only at the project's end) is seen as competent and conscientious but not given the necessary oversight and support from Kabul.

Lesson learned: a senior, seasoned CTO is required for complex activities – project closeout is no exception. Backstop officers should visit with enough frequency to understand the unique context. Travel to the North is troublesome, but clearly could have been done within the current security ground rules and transportation availability.

10.7 Provision for Post Project Remedial Action. When PADCO left there was no effective mechanism for enforcing the subcontractor warranties against faulty work, nor for completion of activities truncated, nor for compensation of project caused losses to individuals.

Lessons Learned: USAID needs a mechanism to correct project mistakes which surface in the immediate post project period. As close-out approaches, an assessment of such clean-up costs needs to be made, and the necessary funds reserved.

10.8 Bad Metrics: Metrics should measure project performance, not drive it. It is difficult to devise metrics that cannot be gamed. Accordingly it is critical that these be field evaluated periodically by USAID, or a least someone independent of the project to see if they are effective and valid. Because context is critical this must be done in the field, by headquarters personnel, not simply certified by some backstop who has no ground familiarity with the activity.²⁶ There is no such thing as a standard kilometer of canal or road or anything else in the mountains of Northern Afghanistan. Further complicating performance measurement were the frequent changes in alignment and routing requested by government entities at all levels and by communities. Lastly, PADCO was required to report on 8 tracking indicators every two weeks. Frequent reporting is not without cost, and it is hard to see operational value in biweekly indicator reports.

²⁵ See appendix ___ [the Baharak Power Canal and related works]

²⁶ The metrics by which ADP-N activities were judged could be compared to those by which Wall Street Bankers were compensated for before the bail-out. They bias everything toward short term measureable progress rather than long term sustainable gains.

10.9 Lessons Learned: Backstop technical officers should periodically field-validate any metrics used to measure or drive project activities. Measures should be limited in number and timed for operational value.

10.10 Excessive Personnel Turnover and Backstop Office change: ADL-N /ADP-N had 10 changes of CTOs and 4 CPOs over its 4 year project life. It also seems that the ADP-N portfolio was moved between differing USAID/Kabul offices with different development philosophies and priority. Each change brought a different vision with different priorities and a different operating style. This appears to have been quite disruptive;

Lessons Learned: Consistency of oversight is to be highly desired.

11.0 Conclusions

There are several different ways to put project results in context: (1) Did the benefits justify the costs; and/or (2) could the same level of benefit be achieved at lesser cost or greater benefit achieved at the same cost. Although outside this analysis, it should be recognized that politically, the USG could not ignore the north – not with respect of poppies and not with respect to political-economic needs. A program needed to be implemented. Nonetheless, the figures – imperfect as they are -- call into question the overall cost-benefit of the activity. It is difficult to argue that \$60 million spent to obtain a present value of benefits on the order of \$40 million constitutes effective use of resources, even if it did create 70,000 jobs, and engender substantial non-quantifiable benefit. Had it been possible to implement the program along the lines it was conceived, the result might have been substantially different. Specifically, partnering with the Aga Khan Foundation, which had local knowledge, staff, and project support infrastructure, might have avoided the de facto loss of the initial project implantation year and the faulty implementation of micro hydro power subprojects. Had the project been able to create a financing facility it could have been more effective in developing cooperatives and agribusinesses. Had the turnover of project CTOs and CPOs been less, better program consistency could have been obtained. Had the project cycle been better tuned to the realities of Northern Afghanistan, there would have been less friction between the contractor and AID, and better implementation. The list could go on, but the ADP-N experience could also be seen as a necessary investment in learning how to mount effective programs in the North. Having paid this price, it would be a shame not to follow-up with effective, longer duration activities.

ANNEXES

Annex Set I. Activity Specific Problem Areas

1. Baharak Power Canal / Road / Micro hydro rehab

Annex set II. Project Design and Oversight Problem Areas

1. Unstable ground rules
2. ST focus to LT goals
2. Shifting focus
3. Ineffective Backstopping
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Annex Set III. Quantitative Estimates and Benefit Calculations and Team Econometrician's Observations

1. Disclaimer
2. Summary Table
3. Fruit and Nuts
4. Roads
5. Veterinary Medicine
6. Vegetables
7. Wheat
8. Agribusiness

Annex Set IV. Sustainability and Social Scientist's Observation

Annex Set V. Project Data

1. CTO Tracking Sheet
2. Contractor closeout report list of accomplishments (annotated by evaluation team)
3. PADCO success claims with team annotation

ANNEX I.1 THE BAHARAK POWER CANAL – SERIOUS AND CONTINUING PROBLEMS REQUIRING REMEDIAL USAID ACTION

- The Baharak Power Canal (aka the Sakhr canal) – \$1.023 million
 - The Baharak Micro hydro Rehabilitation -- \$0.031 million
 - The Baharak Road (below canal) -- \$0.590 million
- Total cost \$1.644 million

The evaluation team heard numerous complaints about all three activities; visited the sites, interviewed provincial government officials, district officials, local arbabs²⁷, and nearby residents.



With respect to the canal, we observed that the canal, much of it unlined, was constructed in unstable soil on a steep slope. Numerous large breaches in the canal were noted, and the road below appeared threatened by the inappropriate construction. Large boulders were noted in the canal which would cause turbulence ultimately destroying the unlined bank and breaching the

canal. The evaluation team has no engineering competence but is of the opinion that the construction is dangerously inept and requires immediate remedial work. Further, in the lined portions and in related culverts the cement appeared substandard and cracks were apparent. Villagers stated that they protested when they observed construction crews mixing cement at a 6 or 7:1 cement to sand ratio (the specifications called for 4:1.) Locals said that no water ever flowed through the canal as it was breached almost immediately. USAID’s reports indicate that parts of the canal were tested with water flow and the breach had been some months later. Parts of the canal had been built for an 8 meter flow, but later sections were downsized to a 4 meter flow after surrounding residents protested that the larger flow would divert water from their existing irrigation canal. Engineers at the Baharak micro hydro power station told the team that they never received any water from the power canal – the station was operating at less than half capacity – and then only at night -- using water from the agricultural water canal.



Another distressing aspect of the construction was that people’s houses and trees were taken for the construction without compensation. How extensive this was is unknown but we spoke with one villager and viewed his half house. Compensation was promised (and

²⁷ Community representatives

that promise later confirmed in speeches by the provincial governor at the inauguration ceremony at which USAID and PADCO were present). Yet no compensation had ever been paid. USAID and PADCO apparently took the view that compensation was a government responsibility. Nonetheless, the people hold PADCO responsible. A promised PADCO-built foot bridge allowing the nearby community to cross the canal was observed to be in a state of deterioration, less than 18 months later. (Picture __.)

Engineers at the power station are very unhappy with the PADCO rehabilitation work. They claim that PADCO never left any documentation as to what repairs had been made. In their view PADCO had done little more than paint the equipment and supply some spare parts.



The road below the canal is yet another problem. It is badly deteriorated and was never hard surfaced as had been promised. (Indeed a small hill of never used and abandoned asphaltting material is visible from the road.)

Local residents are quite upset over the matter. When it became known

that an evaluation team was inspecting PADCO work, a local delegation requested to meet with the team. This was led by the district police chief (Commander ____?) who had been acting district governor at the time the canal was constructed. The commander explained that he asked for the meeting with two issues in mind: the Sokura canal and road; and (2) security in Baharak. As former acting district governor and current police chief he had received many complaints about PADCO in general and the Socura canal and road in particular. “The people hate the project and hate PADCO. Does not USAID realize that at the canal intake there is a big billboard advising to the world that USAID was responsible (for this disaster)?” He began by noting that the canal is a disaster from every stand point -- large sums were expended by USAID. People’s homes and orchards had been destroyed to make way for the canal – yet it was so badly done it never held water. He was particularly offended that because he represented the government at the time, people associated him with the corruption that, in the popular mind, could only have accounted for this disaster.

The Baharak road was a related concern. In their speeches both the Province Governor and the PADCO representative promised the road would be paved. A USAID/Kabul official was present along with USAID’s Faizabad-based engineer. They did not disagree. Later a PADCO representative came to his office (the acting governor) and asked him to sign a letter accepting the road which stated that the canal road was finished except for the asphalt. The document further stated that cold weather did not allow the application of the paving material. The PADCO representative assured him that in the spring, the road would be paved. The then acting governor said he would sign the acceptance document if PADCO would give him a letter promising to apply the asphalt

when warmer weather returned. The PADCO representative “sneaked out of the office and never returned”. The commander provided a copy of the acceptance document PADCO presented. It was signed by PADCO COP Carlson Coleman and was dated December __, 2008. Since the PADCO closeout was then in process, it seems clear that there was not any intention to pave the road. A large pile of unused asphalt rock is visible from the road, and attributed by local residents to the unfinished road. The commander said everything PADCO did was bad. When asked as to a specific bridge (known to the team to be a good job) he allowed as to this bridge and 4 or 5 other bridges done by PADCO were well done and well received.



ADP/N: Impact of Micro-hydropower Plant

Introduction

According to the NRVA, 20% of the Afghan population is connected to the public grid, of which the rural population accounts for a mere 6% (NRVA 2007/8, Main Report). Over 80% of the population relies on solid fuels, mainly fire wood, bushes and twigs and animal dung. The situation in Badakhshan is not that different from the national level. Few districts have access to electricity and those households connected to the electricity grid in Faizabad are residents within a 2 to 5km radius, at most. Some districts, like Baharak have small scale hydropower and some even run generators. The ratio of the population serviced by these plants is probably even less than the national average. Most of the population in Badakhshan has no access to electricity. Farm households use solid fuels for heating, cooking and lighting. The impact of this on health, particularly on women's health, is unmeasurable. Incomplete combustion and emission of compounds has the potential to induce serious health hazards, besides producing greenhouse gasses that contribute to climate changes.

The linkages between rural energy and poverty alleviation, and the potential contribution of renewable energies for rural electrification, have both been well recognized. These sources include, among others, hydropower schemes which can be usefully harnessed for rural energy demands from small rivers, and canals where there is a gradient of a few meters and the flow rate is more than a few litres per second. Although the amount of available energy is site specific, Badakhshan is well endowed with water flowing from the mountains, which can provide energy for many isolated rural communities.

Micro-hydropower is a renewable and clean energy option, used extensively for electricity generation to alleviate poverty. The present best practices include: sustainability, good governance, appropriate tariff setting, community participation at all range of issues related to energy services. There are a large number of successful small hydro schemes in different developing countries, which show their adaptability to the local conditions, their sustainability and their positive contribution to local development.

ADP/N implemented several feasibility studies of rivers and canals for hydropower generation. It contracted Maunsell New Zealand and Winrock International to undertake technical feasibility studies of hydropower generations for Faizabad, Baharak, Kishem, Jurum and Darayi districts. The total cost of these feasibility studies is US\$559,387. It was rationalized that the provision of electricity would improve the quality of life and increase business opportunities. The canals would also provide reliable water supply for irrigation downstream, increase employment and agriculture productivity. However, ADP/N rehabilitated only two existing power generating plants – Baharak and Faizabad- and constructed one small scale village based micro-hydro power in Wardoj district and abandoned the other three on the ground of cost.²⁸ These power plants use gravity-fed water to produce electricity. Water is diverted into canals, eventually cascading down

²⁸ ADP/N has also run out of budget and by the time it had selected the powers it was deep into the last quarter of 2008 and opted for refurbishment of existing power plants.

penstocks. Inside the power house, water flows through a turbine whose spinning blades, or runners, power generators to produce electricity. The amount of kilowatts produced by the generators is a function of the amount of water coursing through the turbines. In appraising impact, ADP/N concluded in its closeout report that “Electrical generating capacity was tripled in Faizabad and Baharak through performance upgrades to hydropower plants from rebuilt turbines and new power canals (ADP/N completion Report, March 2009). This assessment has set out the objective of validating this ADP/N statement.

The assessment consisted detailed discussions with the provincial Energy and Water Department senior staff, technicians at the power plants, and a review of available reports and minutes. The evaluation team has also consulted an ex-ADP/N technical person familiar with the infrastructure projects currently residing overseas.

The Projects

Baharak had Soviet-era turbines that outlived their working years. The power plant generated 60Kw to provide on average about 43 Watt per household. Only one of the turbines was functioning, producing 60Kw power. Such low power generation means only 400 households out of 6,000 households of the district were getting electricity. ADP/N rebuilt the turbines at the quasi-Government Da Afghanistan Brushna Mosis (DABM) workshop in Puli-Khumri. New runner blades pin bearings were also imported from abroad and installed. Civil works were done on repairing the forebay and spillway structures; the trash rack and penstock dewatering valves were replaced. The power house has also been cleaned and painted. The total cost for the proposed rehabilitation measures was US\$ 167,227. With refurbishment and rehabilitation the power plant would have a 100KW capacity to serve more consumers or provide 72 Watts per household for existing customers.

The refurbishment and rehabilitation of the power plant has not delivered sufficient electricity. Providing power to residents of Baharak and the surrounding villages and towns required construction of a canal extending 7.1Km from an intake on the Zardew River located on Shohada road which was rehabilitated by ADP/N. The canal (also called Sakha canal) was constructed at a cost of **US\$1,014,486** for an initial capacity of 1.5m³/sec with the potential to upgrade to 4m³/sec. The expectation was that once water starts to flow from Sakha canal, the Baharak power would generate 220-230Kw electricity 24 hours a day, seven days a week, an amount sufficient to power 500 homes, schools, businesses and government offices in and around the town. Though located in Baharak, the power plant was also intended to supply electricity to the provincial capital, Faizabad. Local idiosyncrasy in the province is based on competition between the two districts where Baharak having resources and Faizabad being the capital.

The canal however did not deliver water to the power plant, as planned. Technicians at the plant informed the team that electricity is still produced by one of the original turbines. Two turbines have not been installed fully. One reason being lack of water; the other because of electric voltage control switches that are regularly interrupted. Earlier, a mission comprising of the CTO (Kim Kim Yee) and other senior staff from USAID and AECOM visited the project (June 25, 2008) and the report submitted by the team pins down the problem to engineering failure. The mission observed some sections of the canal collapsed and the wall not protected by stone masonry. The mission warned that the project may fail as it was not done according to the BoQ. The evaluation team has visited the canal and discussed with farmers located in the vicinity of the canal and with other

stakeholders. The canal has deteriorated much since it was constructed two years ago. There was no water flowing downstream to the power plant as seasonal floods and water infiltration have eroded the canal in many locations. Had the canal functioned, the actual amount of water flowing into the plant would probably have also been less, because farmers along the canal have permission to siphon off water for irrigation. Estimates are that up to 50% of the flow will go for irrigation in spring and summer. This would have adversely affected the power generation capacity of the plant. In a state of trade off between irrigation and power, the former often prevails. Moreover, as the USAID mission also noted, the understanding ADP/N had reached with local government to compensate farmers and shopkeepers dislocated by the construction of the intake remains unresolved, causing much distress to the affected farmers.

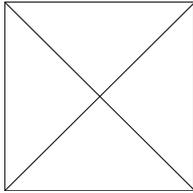
As in the case of Baharak power, the Faizabad power also uses water from an existing irrigation canal, Jawzoon, with its intake on river Jawzoon, some 3 kilometer outside the old city, Faizabad. Due to low water flow and chipped, inefficient turbine blades, the hydro-power plant was producing 40kw electricity for 500 homes nearby the station, often intermittently. The facility needed more water flow and a rebuilt turbine to boost the power generation capacity of the plant.

ADP/N cleaned and lined 2.7km length of the Jawzoon canal, installed a trash rack and barriers to control debris entering the spillway. ADP/N reported that due to its work on the canal, the flow rate has increased from 250 liters/second to 450 liters/second. It also reported to having installed a new turbine runner built at the DABM workshop in Pul-i-Khumri. New needle bearings were also installed for the rebuilt turbine to operate at peak efficiency. ADP/N reported the refurbished turbine generation capacity to have more than doubled to 85Kw with the potential even reaching 90Kw to provide power 24-hours a day to 600 households. The total cost of rehabilitation-cum-refurbishment was US\$461,442.

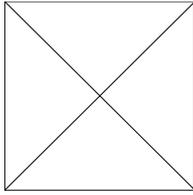
However, discussions with technicians at the power plant casts doubt if this level of efficiency has indeed been achieved. Technicians noted that the water level has not increased much to drive the newly-cast turbine blades to spin faster. The evaluation team has learned that around 500 households are still getting electricity every other night. They have no electricity during the day. Government offices get electricity 24 hours. As ADP/N documents also show people siphon off water at the intake for private use at the expense of water reaching the power house. Dumping waste in the canal is further reducing the flow as well as speed of water reaching the power house. ADP/N augmented its intervention by supplying the power plant with two generators and some fuel worth thousands of dollars as part of its equipment disbursement plan. At the time of visiting the power plant, technicians informed the team that the generators were only used for few weeks due to lack of fuel. Demand for electricity is such that it is supplied from 5PM till mid-night every day. However, the per kilo watt cost is exceptionally high at 10Afs. Hence, most people can not afford to buy electricity and this has perversely affected coverage.

An attempt is made to evaluate the impact of the power plants. The data are patchy but nonetheless adequate to derive some parameters of outcome. Table 1 tests the efficiency of Baharak power plant. The analysis is conduct in two ways; one is by imputing all costs, including the cost of Sakha canal and, the other, by discounting capital cost but considering operational and maintenance expenses. The analysis is done both for the power plant and for consumers. The power plant has a negative NPV if the capital cost is imputed. Indeed the power plant can not recover the cost of the rehabilitation and canal

construction during the life of the plant. Discounting the capital cost (assuming it is a sunk cost incurred by the donor) and applying operation and maintenance costs improves the NPV to a positive US\$56,673 with a very high IRR. From the consumer point of view the annual electricity bill is much higher than the annual cost of kerosene incurred by a household. Based on data obtained from technicians at the power plant, the average annual cost of kerosene incurred for lighting by the 400 households would be US\$14,898 (for half the year as electricity is available every other day only). The annual electricity bill of these households is US\$17,143. This means that a household is worse off by about US\$6/year.



This analysis can be extended to Jowzoon canal. A typical scheme, the power plant generates limited supply of electricity its distribution has to be rationalized. The plant sales electricity worth about US\$43,000 per annum. If operation and maintenance costs are imputed, the power plant has a negative net present value. The benefit to consumers is negative and twice higher than their lighting bill without rehabilitation of the plant.



The erratic supply of power and high cost means the hydropower schemes are not promoting productive end uses. Indeed, information compiled from both Baharak and Faizabad suggests that the hydropower energy plants did not induce local economic growth; there are no new processing plants established and productive activities initiated locally. Around Baharak, some 50 woodwork plants were established but they do not work optimally as they get electricity every other day.

The Wardooj micro hydropower plant is, by comparison, very small but a viable scheme. Constructed at a cost of US\$2,000 the hydropower plant generates adequate electricity 24 hours a day year round for 160 households of two villages. Management is decentralized to the local level such that each household pays \$0.10 per bulb, \$.25 for radio and \$0.65 for TV per month. In comparative terms, the investment cost for a small hydro is slightly higher than that for its most important competitor - the diesel generator,²⁹ but its running cost is low as it is driven by water while diesel sets require a permanent purchase of diesel, furthermore diesel sets generally have a much shorter life span hence more demanding in reposition costs. With appropriate implementation and management setup in place, the cost of a kWh for a micro hydro can be one half to one fourth of the unit cost of energy produced with diesel sets.³⁰

Sustainability

A final remark is made on the issue of sustainability. Sustainability of the projects is analysed in its economical, institutional and technical. Micro-hydro power is a low energy unit (kWh) cost compared to other available options; with appropriate implementation and management setup in place, the cost of a kWh for micro hydro can be one half to one fourth of the unit cost of energy produced with diesel sets. They are also environmentally friendly; because they are generally built using simple structures with minimum alteration of the watershed conditions. They use canal and river water flow, which goes back to its original course for irrigation downstream. Given its size, the Wardooj hydel was built with considerable participation by communities who are also operating and managing the system.

²⁹ Diesel sets generally need less initial investment costs but their running costs are high due to fuel costs and high cost of spare parts and technical services.

³⁰ The life span considered for the different technologies is: hydro 25 years, solar 30 years, wind 20 years and diesel sets 15 years.

In the case of Baharak and Faizabad, the technology still uses water but this does not contribute to sustainability in many dimensions. A management system has to be developed that takes into account demand for electricity (considering willingness to pay and capability to pay); investment costs; operation and maintenance costs. Metering of consumption and billing accordingly is also important. Upon completion the power plants were turned over to the provincial Department of Electricity, DABM. But DABM does not have the resources to carry out regular maintenance works. The sustainability of the power plants is, therefore, questionable. Management likewise needs improvement. DABM still has to work out a tariff scheme to make the power plants self-sustaining as currently, many of its power consumers do not pay electricity bill. Technical persons at the Jowzoon power plant informed the team that all houses have meters. However, the revenue DABM gets is far too little to pay for its operation expenses.

In conclusion, it is evident that rehabilitation of the power plants was a short-term measure to meet the electricity demands for Faizabad and Baharak towns. Extending coverage beyond the existing level on a sustained level requires either extension of the electricity grid or implementing higher capacity hydropower plants for a long term solution. The feasibility studies by Winrock and Maunsell provide sufficient justification for resource allocation for hydropower generation.



Left overs and cuts

Notwithstanding the problems related to measurement and quantification, the project has realized most of the expected outputs set forth in the PMP, and output indicators as reported in a series of bi-weekly and quarterly reports. This evaluation has independently measured net incremental benefits attributable to the project. Attribution is validated, as required by the scope of work, through the use of counterfactuals. The mean outcomes of interventions are compared with the mean outcomes of non-interventions (with and without interventions) and impact is estimated, to the extent data allowed, by the difference-in-difference method. We have found the net impact of interventions to be well below that claimed in project document.

Ways should have been found to de-link this cycle from the FY driven AID cycle.

Inability to devise and define standardize metrics is a serious problem, which far transcends this project. In the case at hand, the very uneven quality of work with the level of effort varying widely makes reliance on such indicators inadvisable. It is not clear that the contractor was gaming the metrics but that was the effect. The biweekly reporting on the eight tracking indicators would seem of little value and at some cost. In any case, we have not dwelled extensively on targets and goals as it is unclear what was actually being reflected in the numbers.

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III.1.1 ADP/N: Impact of Micro-hydropower Plant

Introduction

According to the NRVA, 20% of the Afghan population is connected to the public grid, of which the rural population accounts for a mere 6% (NRVA 2007/8, Main Report). Over 80% of the population relies on solid fuels, mainly fire wood, bushes and twigs and animal dung. The situation in Badakhshan is not that different from the national level. Few districts have access to electricity and those households connected to the electricity grid in Faizabad are residents within a 2 to 5km radius, at most. Some districts, like Baharak have small scale hydropower and some even run generators. The ratio of the population serviced by these plants is probably even less than the national average. Most of the population in Badakhshan has no access to electricity. Farm households use solid fuels for heating, cooking and lighting. The impact of this on health, particularly on women's health, is unmeasurable. Incomplete combustion and emission of compounds has the potential to induce serious health hazards, besides producing greenhouse gasses that contribute to climate changes.

The linkages between rural energy and poverty alleviation, and the potential contribution of renewable energies for rural electrification, have both been well recognized. These sources include, among others, hydropower schemes which can be usefully harnessed for rural energy demands from small rivers, and canals where there is a gradient of a few meters and the flow rate is more than a few litres per second. Although the amount of available energy is site specific, Badakhshan is well endowed with water flowing from the mountains, which can provide energy for many isolated rural communities.

Micro-hydropower is a renewable and clean energy option, used extensively for electricity generation to alleviate poverty. The present best practices include: sustainability, good governance, appropriate tariff setting, community participation at all range of issues related to energy services. There are a large number of successful small hydro schemes in different developing countries, which show their adaptability to the local conditions, their sustainability and their positive contribution to local development.

ADP/N implemented several feasibility studies of rivers and canals for hydropower generation. It contracted Maunsell New Zealand and Winrock International to undertake technical feasibility studies of hydropower generations for Faizabad, Baharak, Kishem, Jurum and Darayi districts. The total cost of these feasibility studies is US\$559,387. It was rationalized that the provision of electricity would improve the quality of life and increase business opportunities. The canals would also provide reliable water supply for irrigation downstream, increase employment and agriculture productivity. However, ADP/N rehabilitated only two existing power generating plants – Baharak and Faizabad- and constructed one small scale village based micro-hydro power in Wardoj district and abandoned the other three on the ground of cost.³¹ These power plants use gravity-fed water to produce electricity. Water is diverted into canals, eventually cascading down

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Baharak had Soviet-era turbines that outlived their working years. The power plant generated 60Kw to provide on average about 43 Watt per household. Only one of the turbines was functioning, producing 60Kw power. Such low power generation means only 400 households out of 6,000 households of the district were getting electricity. ADP/N rebuilt the turbines at the quasi-Government Da Afghanistan Brushna Mosis (DABM) workshop in Puli-Khumri. New runner blades pin bearings were also imported from abroad and installed. Civil works were done on repairing the forebay and spillway structures; the trash rack and penstock dewatering valves were replaced. The power house has also been cleaned and painted. The total cost for the proposed rehabilitation measures was US\$ 167,227. With refurbishment and rehabilitation the power plant would have a 100KW capacity to serve more consumers or provide 72 Watts per household for existing customers.

The refurbishment and rehabilitation of the power plant has not delivered sufficient electricity. Providing power to residents of Baharak and the surrounding villages and towns required construction of a canal extending 7.1Km from an intake on the Zardew River located on Shohada road which was rehabilitated by ADP/N. The canal (also called Sakha canal) was constructed at a cost of **US\$1,014,486** for an initial capacity of 1.5m³/sec with the potential to upgrade to 4m³/sec. The expectation was that once water starts to flow from Sakha canal, the Baharak power would generate 220-230Kw electricity 24 hours a day, seven days a week, an amount sufficient to power 500 homes, schools, businesses and government offices in and around the town. Though located in Baharak, the power plant was also intended to supply electricity to the provincial capital, Faizabad. Local idiosyncrasy in the province is based on competition between the two districts where Baharak having resources and Faizabad being the capital.

The canal however did not deliver water to the power plant, as planned. Technicians at the plant informed the team that electricity is still produced by one of the original turbines. Two turbines have not been installed fully. One reason being lack of water; the other because of electric voltage control switches that are regularly interrupted. Earlier, a mission comprising of the CTO (Kim Kim Yee) and other senior staff from USAID and AECOM visited the project (June 25, 2008) and the report submitted by the team pins down the problem to engineering failure. The mission observed some sections of the canal collapsed and the wall not protected by stone masonry. The mission warned that the project may fail as it was not done according to the BoQ. The evaluation team has visited the canal and discussed with farmers located in the vicinity of the canal and with other

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As in the case of Baharak power, the Faizabad power also uses water from an existing irrigation canal, Jawzoon, with its intake on river Jawzoon, some 3 kilometer outside the old city, Faizabad. Due to low water flow and chipped, inefficient turbine blades, the hydro-power plant was producing 40kw electricity for 500 homes nearby the station, often intermittently. The facility needed more water flow and a rebuilt turbine to boost the power generation capacity of the plant.

ADP/N cleaned and lined 2.7km length of the Jawzoon canal, installed a trash rack and barriers to control debris entering the spillway. ADP/N reported that due to its work on the canal, the flow rate has increased from 250 liters/second to 450 liters/second. It also reported to having installed a new turbine runner built at the DABM workshop in Pul-i-Khumri. New needle bearings were also installed for the rebuilt turbine to operate at peak efficiency. ADP/N reported the refurbished turbine generation capacity to have more than doubled to 85Kw with the potential even reaching 90Kw to provide power 24-hours a day to 600 households. The total cost of rehabilitation-cum-refurbishment was US\$461,442.

However, discussions with technicians at the power plant casts doubt if this level of efficiency has indeed been achieved. Technicians noted that the water level has not increased much to drive the newly-cast turbine blades to spin faster. The evaluation team has learned that around 500 households are still getting electricity every other night. They have no electricity during the day. Government offices get electricity 24 hours. As ADP/N documents also show people siphon off water at the intake for private use at the expense of water reaching the power house. Dumping waste in the canal is further reducing the flow as well as speed of water reaching the power house. ADP/N augmented its intervention by supplying the power plant with two generators and some fuel worth thousands of dollars as part of its equipment disbursement plan. At the time of visiting the power plant, technicians informed the team that the generators were only used for few weeks due to lack of fuel. Demand for electricity is such that it is supplied from 5PM till mid-night every day. However, the per kilo watt cost is exceptionally high at 10Afs. Hence, most people can not afford to buy electricity and this has perversely affected coverage.

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Table 1: Evaluating the Efficiency of Baharak Power Plant

Without		With							
	Cost	Cost					Benefit	Net incremental benefits	
Year	Kerosene	Capital cost	Rehabilitation Cost	Operation	Lubricants/spare parts	Total cost	Hydel (lighting)	Option 1	Option 2
1		1,014,486	167,227	3967	1053	1,186,733	0	(1,186,733)	(5,020)
2	14,898			3967	1053	5,020	17,143	12,122	12,122
3	14,898			3967	1053	5,020	17,143	12,122	12,122
4	14,898			3967	1053	5,020	17,143	12,122	12,122
5	14,898			3967	1053	5,020	17,143	12,122	12,122
6	14,898			3967	1053	5,020	17,143	12,122	12,122
7	14,898			3967	1053	5,020	17,143	12,122	12,122
8	14,898			3967	1053	5,020	17,143	12,122	12,122
9	14,898			3967	1053	5,020	17,143	12,122	12,122
10	14,898			3967	1053	5,020	17,143	12,122	12,122
11	14,898			3967	1053	5,020	17,143	12,122	12,122
							IRR	-	241%
							NPV	(\$998,428)	\$56,673

Note

Option 1 is including capital cost (canal construction); option 2 considers this a sunk cost and includes only operation, lubricants and spare part costs. At the individual household level, the hydel does not produce positive incremental benefits. The cost of kerosene used for lighting is much less than the average annual electricity bill paid by consumers.

This analysis can be extended to Jowzoon canal. A typical scheme, the power plant generates limited supply of electricity its distribution has to be rationalized. The plant sales electricity worth about US\$43,000 per annum. If operation and maintenance costs are imputed, the power plant has a negative net present value. The benefit to consumers is negative and twice higher than their lighting bill without rehabilitation of the plant.

Table 2: Evaluating the Efficiency of Faizabad Power Plant

Year	Without Cost			With Cost			Benefit	Net incremental benefits
	Kerosene	Capital cost	Rehabilitation Cost	Operation	Lubricants/spare parts	Total cost	Hydel (lighting)	
1		417,590	43,852	15980	1053	478,475	0	(478,475)
2	18,622			15980	1053	17,033	42,857	25,824
3	18,622			15980	1053	17,033	42,857	25,824
4	18,622			15980	1053	17,033	42,857	25,824
5	18,622			15980	1053	17,033	42,857	25,824
6	18,622			15980	1053	17,033	42,857	25,824
7	18,622			15980	1053	17,033	42,857	25,824
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10	18,622			15980	1053	17,033	42,857	25,824
11	18,622			15980	1053	17,033	42,857	25,824

IRR -10%
NPV (\$296,929.04)

Note:

The Faizabad power plant is run on a commercial basis; hence the kilo watt rate is high, 10Afs. But weak management combined with inadequate metering system means the power plant does not collect the full cost of supplying electricity to its customers.

The erratic supply of power and high cost means the hydropower schemes are not promoting productive end uses. Indeed, information compiled from both Baharak and Faizabad suggests that the hydropower energy plants did not induce local economic growth; there are no new processing plants established and productive activities initiated locally. Around Baharak, some 50 woodwork plants were established but they do not work optimally as they get electricity every other day.

The Wardooj micro hydropower plant is, by comparison, very small but a viable scheme. Constructed at a cost of US\$2,000 the hydropower plant generates adequate electricity 24 hours a day year round for 160 households of two villages. Management is decentralized to the local level such that each household pays \$0.10 per bulb, \$.25 for radio and \$0.65 for TV per month. In comparative terms, the investment cost for a small hydro is slightly higher than that for its most important competitor - the diesel generator,³² but its running cost is low as it is driven by water while diesel sets require a permanent purchase of diesel, furthermore diesel sets generally have a much shorter life span hence more demanding in reposition costs. With appropriate implementation and management setup in place, the cost of a kWh for a micro hydro can be one half to one fourth of the unit cost of energy produced with diesel sets.³³

³² Diesel sets generally need less initial investment costs but their running costs are high due to fuel costs and high cost of spare parts and technical services.

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Sustainability

A final remark is made on the issue of sustainability. Sustainability of the projects is analysed in its economical, institutional and technical. Micro-hydro power is a low energy unit (kWh) cost compared to other available options; with appropriate implementation and management setup in place, the cost of a kWh for micro hydro can be one half to one fourth of the unit cost of energy produced with diesel sets. They are also environmentally friendly; because they are generally built using simple structures with minimum alteration of the watershed conditions. They use canal and river water flow, which goes back to its original course for irrigation downstream. Given its size, the Wardooj hydel was built with considerable participation by communities who are also operating and managing the system.

In the case of Baharak and Faizabad, the technology still uses water but this does not contribute to sustainability in many dimensions. A management system has to be developed that takes into account demand for electricity (considering willingness to pay and capability to pay); investment costs; operation and maintenance costs. Metering of consumption and billing accordingly is also important. Upon completion the power plants were turned over to the provincial Department of Electricity, DABM. But DABM does not have the resources to carry out regular maintenance works. The sustainability of the power plants is, therefore, questionable. Management likewise needs improvement. DABM still has to work out a tariff scheme to make the power plants self-sustaining as currently, many of its power consumers do not pay electricity bill. Technical persons at the Jowzoon power plant informed the team that all houses have meters. However, the revenue DABM gets is far too little to pay for its operation expenses.

In conclusion, it is evident that rehabilitation of the power plants was a short-term measure to meet the electricity demands for Faizabad and Baharak towns. Extending coverage beyond the existing level on a sustained level requires either extension of the electricity grid or implementing higher capacity hydropower plants for a long term solution. The feasibility studies by Winrock and Maunsell provide sufficient justification for resource allocation for hydropower generation.

III.1.2

Annex 5: IMPACT ANALYSIS: BAHARAK - SHOHADA ROAD, BADAKHSHAN

YEAR	VALUE ADDED	REDUCED	BENEFITS PASSENGER TO FARMERS	PRODUCER SURPLUS	PASSENGER USER COST SAVING (fares)	TRAVEL TIME COST SAVING (opportunity cost)	NET VEHICLE OPERATING COST SAVING	ROAD	NET BENEFITS
								REHABILITATION/ MAINTENANCE COST	
Base Year								1,943,967.00	(1,943,967.00)
1	63.15	408.69	442.79	4,556.12	73,066.67	458,705.67	58,319.01		478,924.07
2	63.15	408.69	442.79	4,556.12	73,066.67	458,705.67	58,319.01		478,924.07
3	63.15	408.69	442.79	4,556.12	73,066.67	458,705.67	58,319.01		478,924.07
4	63.15	408.69	442.79	4,556.12	73,066.67	458,705.67	58,319.01		478,924.07
5	63.15	408.69	442.79	4,556.12	73,066.67	458,705.67	58,319.01		478,924.07
6	63.15	408.69	442.79	4,556.12	73,066.67	458,705.67	58,319.01		478,924.07
7	63.15	408.69	442.79	4,556.12	73,066.67	458,705.67	58,319.01		478,924.07
TOTAL	442.04	2,860.80	3,099.55	31,892.86	511,466.67	3,210,939.67	2,352,200.07		1,408,501.51
							IRR		16%
	IMPACT (US\$)	Undiscounted	1,408,501.51				NPV at 12% discount rate		\$215,826.67
		Discounted	\$215,826.67	1,800,190.63			B/C Ratio	$\frac{215,826.67}{1,973,322}$	0.11

	.11	
	Impact per kilometer	\$9,810.30

III.1.3

Annex Set IV. Project Documents

IV.1 Listing of ALP/ADP-N COPs and CTOs

Afghanistan Development Program-North (ADP/N)
306-M-00-05-00517-00

List of Chiefs of Party	Period of Service
Jon Keeton	2/28/05 - 08/05/05
Richard Mounsey	03/20/05 – 01/29/06
Jim Graham	1/18/06-9/17/07
Carson Coleman	10/22/07-1/2/09

Name of CTO/COTRs	Capacity	Designation Letter Date
Dan Miller	CTO	2/17/05 (Task order award)
Al Merkel	CTO	8/17/05
Alex Klaitis	Field Advisor	
Beth Dunford	Alternate CTO	11/6/05
Bill Bradley	CTO	4/1/06
David Bilings	temp alternate CTO	8/7/06
Jeremy Foster	CTO	3/18/07
Mohammad Nazir	temp contract admin.	8/6/07
Kim Kim Yee	CTO	6/11/08
Mohammad Nazir	CTO	4/13/08
Mohammad Nazir	CTO	10/20/08

Source: AECOM