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Aquafondo

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**RE:** **Phase II Task 7 – Project Eligibility Considerations for Aquafondo**  
**DRAFT Working Version**

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## Overview

This evaluation builds on a K&A 2012 Phase I Report and a Phase II – Task 6 K&A Technical Memorandum. The Phase I report lays out an operational framework for Aquafondo and introduces the use of a quantifiable metric to assess environmental outcomes for water quality and water quality improvement projects in the Rímac and Callio River Basins. The Task 6 memorandum illustrates the use of these metrics for project solicitation, evaluation, ranking and selection. Task 7 efforts, reported herein, examine potential pre-requisites for projects or applicants, such as minimum performance standards, ability to provide matching funds, capability to self-evaluate performance, intuitional capacity and sustainability. K&A will work with Aquafondo to select and incorporate these factors and performance measures and assemble this into a final program framework recommendation under a Phase II Task 8. Once the framework has been assembled, it will be tested under subsequent Phase III through pilot project demonstrations.

Establishing eligibility criteria enables a more robust project selection and evaluation method that helps ensure that program goals are met. These criteria can be applied to help ensure project outcomes align with program objectives. In addition, eligibility criteria can reduce transaction costs by reducing the number of applications received or enabling more rapid elimination of applications that do not meet the basic requirements. On the other hand, these criteria can increase some transaction costs by requiring a more in-depth analysis of proposed projects. This trade-off should be balanced to generate efficient outcomes. This memorandum examines these considerations through an evaluation of other similar applications in other programs.

## PES Related Applications

Despite the recent increases in the number of payment for ecosystem services (PES) programs being implemented, there is a lack of robust assessment for how well these programs have achieved their stated – and often lofty – goals. Existing programs tend to

not incorporate robust evaluation mechanisms, while several independent assessments that have been conducted indicate relatively little success at achieving stated objectives (Persson, 2011). In many other cases, it is possible PES programs are meeting their objectives and expectations. However, the documentation or data necessary to generate this evidence of success does not exist. This documentation and related data are critical for demonstrating that PES schemes generate additionality – additional environmental or social benefits that would not have occurred without the program.

In general, PES programs lack sufficient monitoring procedures or requirements that would enable success to be demonstrated and documented. There are very few examples of PES programs that generate consistent measurements or monitoring of the watershed services being generated by the program (Porras *et al.*, 2008). Of the programs that have reported quantified results, the measurements often are not considered reliable for a variety of reasons, such as restricted timeframes or confounding factors such as weather events (Porras *et al.*, 2008). Strengthening monitoring and enforcement, for example, is identified as a goal for China's eco-compensation programs (Zhang *et al.*, 2010). Several programs report impacts based on user views or others who provide qualitative opinions on project results (Porras *et al.*, 2008). Other PES schemes that do conduct evaluations typically rely on proxies such as satellite imagery of land cover to estimate changes in forest area. However, these programs do not take the next step of establishing the linkage between land use changes and ecosystem service impacts. As such, these programs are not able to quantify environmental service outcomes such as improved water flows or water quality.

Determining whether PES programs are meeting stated objectives requires establishing linkages between the measureable land use change and associated impact on watershed indicators, such as nutrient concentrations (Blignaut *et al.*, 2010). Typically, the relationships between land use and water quality are more well-known and established than the linkages between land cover and water quantity (Porras *et al.*, 2008). This can create issues when proxies are used to assess impacts on flow.

Relationships between changes in land use or practices and impacts on ecosystem services differ among watersheds, even in the same region, making it difficult to apply linkages established elsewhere. For example, Blignaut *et al.* (2010) modeled the impacts of land use management change in two subwatersheds in southern Africa where a payment program was instituted to restore native grasslands. Substantial differences were observed between the two study areas, and the researchers attributed these differences to the degree of disturbance and degradation of the grassland. The Working for Water (WfW) program in South Africa has demonstrated the relationship between removing invasive species to restore grasslands and improved water flow (Porras *et al.*, 2008). One study estimated that clearing these invasive plants increased annual stream flow by almost 46 million m<sup>3</sup>. Another study estimated that the program provided employment for approximately 24,000 unemployed individuals (Turpie *et al.*, 2008).

The lack of evaluation and monitoring data has made it difficult to attribute additionality to PES schemes. Persson (2011) conducted a modeling effort to assess the additionality

associated with PES schemes and how well these programs contributed to the desired outcomes. Additionality was low in most programs, with an average of 14.6 percent of the benefits being additional when compared to what would occur in the absence of the program (Persson, 2011). Figure 1 illustrates the relative additionality provided through various programs. In the programs assessed, reduced additionality was attributed to the selection of participants who had already achieved the program requirements prior to enrollment. In many cases, participants chose to enroll in the PES program because there was no other profitable land use (Persson, 2011). As such, these projects did not contribute to additional conservation that would not have occurred without the PES payment.

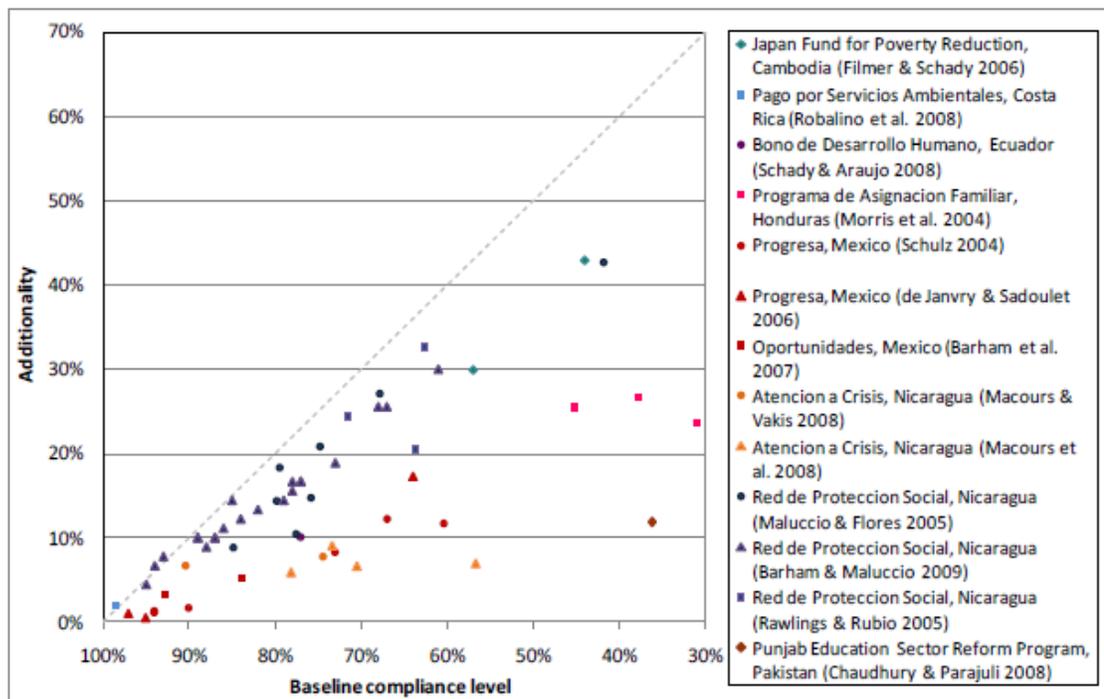


Figure 1. Additionality estimates based on school enrollment, health care utilization, and forest conservation (Persson, 2011).

Project and participant targeting can be conducted to help address the need for additionality. More often than not, the land enrolled in existing PES programs has been marginal farmland or land not suited to other economic uses. As a result, these programs have not substantially contributed to environmental gains, such as slowing deforestation. For example, substantial portions of the land under China’s Sloping Land Conversion Program have a low slope and therefore are not at risk of erosion (Porras *et al.*, 2008). Similarly, in Mexico’s national Program for Hydrological Environmental Services (PSAH) and Costa Rica’s national afforestation program, much of the land enrolled was not at high risk of conversion and was enrolled given the low opportunity costs (Porras *et al.*, 2008 and Persson, 2011). Identifying the activities that would occur in the absence of

the PES payment can help the program target projects and practices that will generate additional benefits.

The Task 7 goals of establishing project and participant eligibility criteria will help Aquafondo learn from established programs and fill the necessary gaps to help ensure additionality and achievement of desired outcomes in the Rimac watershed. Better targeting will improve additionality and monitoring will provide the data necessary to demonstrate that the program is meeting stated objectives. Gathering the information necessary to identify which participants would achieve program outcomes without PES payments will help inform targeting efforts. However, it will be necessary to balance the environmental and social goals. For example, if alleviating poverty is a high-priority goal, it might not be appropriate to address additionality concerns by decreasing the number of program beneficiaries (Persson, 2011 and Sommerville, 2009).

## Aquafondo Eligibility Considerations

Based on a review of academic literature and readily available documentation of existing PES programs, very few programs apply specific constraints on the types of projects and participants being funded. In general, the eligibility criteria applied depends on the geographic scale of the program. In larger national programs, eligibility criteria tend to be centralized and generalized (Porrás *et al.*, 2008).

In the Rímac setting, Aquafondo may wish to consider use of various eligibility requirements to select: 1) potential projects; and, 2) program participants. As such, payments will be conditional on the project and participant meeting these basic requirements. Establishing eligibility criteria will enable Aquafondo to eliminate projects that either are not consistent with the Fund's goals or do not generate substantial benefits relative to the cost of implementation. When selecting these criteria, the Fund should attempt to balance the goal of maximizing benefits while not making transaction costs overly burdensome. Participant eligibility considerations address critical issues such as how the Fund might expect projects to be maintained and whether the capacity is there to ensure long-term benefits. Both project and participant eligibility are discussed as follows.

### *Project Eligibility*

Project eligibility considerations incorporate multiple factors, including how well the project type and location fit with Aquafondo objectives and specific characteristics of the land on which the project will take place. The project type should be clearly defined, and include a description of the service or activity being funded. Other project eligibility factors include the cost of project implementation and how that cost compares to the benefits being generated. The duration of the project and whether or not it provides multiple services also should be considered.

***Does the project meet Aquafondo objectives?***

Both project type and location eligibility criteria should be specified such that the outcome will align with Aquafondo’s objectives. These criteria should be selected such that the associated land management practices will “deliver” the ecosystem service desired in the area of interest. Specific objectives identified by Aquafondo that should be used to inform project type and location eligibility criteria include the following: restoration and protection, sustainable agriculture, farmland protection, infiltration practices/aquifer protection, river hydrology, and water pollutants.<sup>1</sup> Based on these stated objectives, K&A illustrated how example project types applicable to the Rimac watershed and Aquafondo priorities could be ranked in the Phase I Report. The rankings were based on several factors that affect implementation feasibility, including cost, relative water quality or quantity benefits, efficacy, fit with local values, scalability, complexity, sustainability, and ease of management. Based on this analysis, the following project types ranked in the top ten (out of twenty total project types):

- 1) Agricultural Irrigation Improvements
- 2) Pasture Management
- 3) Infiltration Practices
- 4) Livestock Exclusion
- 5) Streambank/Vegetative Buffers
- 6) Urban Water Conservation Practices
- 7) Wetlands Restoration
- 8) Micro Reservoirs
- 9) Nutrient Management
- 10) Streambank Restoration

This ranking can be used to inform how Aquafondo prioritizes project selection based on type. Selection criteria should incorporate the multiple factors considered for the ranking assessment.

The same twenty water project types in the Phase I Report were qualitatively assessed based on their potential to contribute multiple ecosystem benefits. The benefits evaluated included reduction of sediment, nutrients, and heavy metals, as well as infiltration and water conservation. A table summarizing the results of this assessment is reproduced here as Table 1. From this analysis, it can be seen that some projects provide multiple benefits of interest to Aquafondo while others are not relevant for these particular water quality objectives.

**Table 1. List of possible ecosystem benefits from water projects. Projects highlighted in gray represent options that were ranked in the top 10 by an assessment of multiple considerations, including cost, relative benefits, efficacy, fit with local values, scalability, complexity, sustainability, and ease of management.**

<b>Project Options</b>	<b>Sediment</b>	<b>Nutrients (N/P)</b>	<b>Heavy Metals</b>	<b>Infiltration</b>	<b>Water Conservation</b>
Reforestation	X	x		x	
Infiltration Practices				x	
Agricultural Irrigation	X	x			x

<sup>1</sup> As described in the document “Aquafondo – Fondo Del Agua Para Lima & Callao: Lineas Estrategicas y Proyectos en Cartera”

Improvements					
Urban Water Conservation Practices					x
Micro Reservoirs					
Water Reuse Projects					x
Pasture Management	X	x		x	
Canal Projects					
Drinking Water Treatment Projects					
Lagoon Restoration	X	x		x	
Livestock Exclusion	X	x			
Streambank/Vegetative Buffers	X	x			
Wetlands Restoration	X	x		x	
Nutrient Management		x			
Solid Waste Collection					
Recycling Projects/Programs					
Streambank Restoration	X	x			
Treatment of Mine Tailings			x		
Sewer Treatment Projects		x			
Dredging Projects	X				

Information regarding the types of benefits provided by each project type can be combined with the results of the ranking process. The top 10 projects are highlighted in gray in Table 1. Combining the two analyses, it can be seen that three of the top 10 projects provide at least three benefits: agricultural irrigation improvements, pasture management, and wetlands restoration. As such, Aquafondo might consider prioritizing these project types in the PES program.

The program framework also can incorporate the location of the project as an eligibility criterion. Project locations should be prioritized based on the relationships between upstream uses and downstream benefits (Smith *et al.*, 2006). For example, the fund might choose to prioritize areas downstream of Huaycolora for nitrogen reductions. Alternatively, all regions can be considered equally eligible. Very few existing PES programs adjust payments based on location (Porrás *et al.*, 2008). Restricting eligibility only to certain regions will make it simpler to target areas where projects are likely to generate greater benefits. However, this approach also will reduce the distribution of the social impacts, including increased income.

***Is the land type eligible?***

Existing land use and parcel size can be considered when determining whether the specific land characteristics are appropriate for project implementation. Specific land uses can be designated ineligible for program participation. For example, the Costa Rica national afforestation program initially excluded mixed land uses, such as agro-forestry. However, this typically excluded poorer landowners. In addition, parcel size can be an eligibility criterion. Aquafondo could target smaller parcels, using this as an indicator of

landowner wealth. Alternatively, the program could implement a size minimum to ensure larger-scale projects.

### ***Is the price right?***

In PES programs, the payment amount is typically negotiated among participants or set by the governing entity. Project eligibility therefore will depend on whether the seller will accept the payment. Sellers are less likely to accept a payment when the overall net return is negative – such as a loss in profits. The exception might be when the landowner expects to generate secondary benefits that counteract the loss.

Project selection based on cost also can be determined through a unit cost ranking. This approach starts by assessing the total benefits and total costs associated with each project. The unit cost is calculated in terms of dollars per unit of benefit – such as pounds of nitrogen reduced. Then projects are ranked in order of their unit cost and those with the least unit cost are funded first. The K&A Task 6 memorandum illustrated how performance metrics for water quantity and quality could be used with project cost data to rank projects for selection and funding based on cost of environmental outcomes.

### ***How long will the project last?***

In order to reduce transaction costs and help ensure continued benefits, existing PES programs have found it beneficial to focus on long-term projects and contracts. This approach helps establish the permanence of the ecosystem services (Smith *et al.*, 2006). Given a desire for longer-term contracts, it likely would be beneficial to work with landowners, as opposed to tenants or other shorter-term land users.

### ***Does the project provide multiple services?***

Aquafondo could emphasize projects that generate multiple ecosystem services. However, this approach would potentially require addressing tradeoffs among the various services, as well as tradeoffs between environmental and social impacts. One consideration for multiple services might be based on the above Table 1 comparisons with a primary focus on a single service and its associated performance based on a specific metric. Cost-benefits, if very similar, could lead to the use of a secondary criterion focused on additional or ancillary benefits from each project.

## ***Participant Eligibility***

Participant eligibility considerations incorporate multiple factors, including whether the individual owns the land and meets minimum performance baselines. Experience from other PES projects has found that well-defined property rights are important for program success (Smith *et al.*, 2006). Other participant eligibility factors include a history of effective management, landowner capacity to sustain the project, and landowner capabilities to monitor project performance. Participation in other programs, achievement of certification requirements, and ability to provide matching fund support also should be considered.

***Does the individual own the land?***

Generally, PES programs are more successful when working with landowners. This makes contract establishment more straightforward and simplifies payments. It also can contribute to project longevity because the landowner has a greater interest in the land than a temporary tenant.

***Does the individual meet minimum performance baselines?***

A minimum performance baseline can be established to provide a basis for determining project outcomes. This baseline becomes the reference point for determining the additional benefits provided by the project. The baseline should incorporate considerations of what changes would occur in the absence of the payment program in order to help ensure additionality (Smith *et al.*, 2006). Without this consideration, the program will lack credibility and be less likely to achieve the stated objectives. However, setting the baseline too high might exclude landowners that could benefit from the program and provide additional benefits through practices they otherwise would not be able to afford.

For certain types of projects, such as those that might address non-conventional pollutants like heavy metals, the baseline for credit generating projects may be more rigid. If active mine tailings piles, for example, were to be covered to reduce leaching of heavy metals, the Fund should determine whether the practice of covering these tailings was already required under an active mining permit. If so, such actions would not result in additional water quality benefits and the project should not be considered for funding. If, however, an abandoned tailings pile were proposed to be covered as a voluntary action where there was no formally responsible party identified, the project might be considered eligible for funding.

In addition to determining whether participants meet a baseline, the program also should assess whether potential participants are already achieving the final performance level – what would be expected as a result of program implementation. Individuals that are already in compliance with the final project requirements will not contribute to additionality (Persson, 2011). As such, the program should target payments to participants that would not meet the program requirements without the additional support.

***Does the individual have a history of effective management?***

A history of effective management demonstrates the potential for success when implementing conservation practices. However, this criterion might exclude some poorer landowners. In addition, landowners that have demonstrated abilities might already be achieving at the final performance level that would be expected as a result of the project. Therefore, the need to ensure practice success should be balanced with the need for additionality.

***Does the individual have the capacity to sustain the project?***

Participants who can sustain projects over the long term will contribute to the permanence of ecosystem services provision. In order to assess this capacity, the program should evaluate external pressures that might lead to the participant

discontinuing the practice. Program facilitators also should determine whether the ability to sustain the project stems from a lack of other opportunities for that land. If this is the case, it is likely no external forces are driving the individual to engage in practices that would degrade the land and therefore the payment incentive is not needed to protect the land. As such, no additionality is provided by the payment. For example, a landowner who is not facing pressure for deforestation will not contribute additional benefits through participation in an afforestation program.

***Does the individual have self-evaluation capabilities?***

The ability of landowners to evaluate and monitor practices can reduce the overall program costs. The landowner would measure and quantify benefits associated with the practice and provide documentation of this assessment. Landowner monitoring would be especially beneficial in more remote areas where it can be difficult and expensive to bring in outside assessors (Porrás *et al.*, 2008). However, requiring substantial self-evaluation capabilities might eliminate the eligibility of poorer landowners who may not have the capacity to self-monitor.

In order to prevent dishonest monitoring, the program could implement consequences such as fines and cessation of payments (Sommerville, 2009). For example, a program in Pimampiro, Ecuador utilizes three potential sanctions, based on the type of infraction. Removal of secondary products results in payments being suspended for one month. Non-permitted selective felling results in payments being suspended for three months. Clear-cutting, which is illegal, results in permanent exclusion from the program and legal ramifications (Porrás *et al.*, 2008).

There is debate among program implementers and other stakeholders regarding how many resources should be devoted to monitoring. Some argue that this money should be allocated to conservation payments (Porrás *et al.*, 2008). A balance should be struck between the need for data to demonstrate program effectiveness and additionality and the need to efficiently allocate scarce resources.

For larger projects, overall monitoring costs become a much smaller proportion of overall project expenditures. In these cases, however, the level of monitoring sophistication is likely to increase. In more rigid water quality trading programs in North America, these settings often require monitoring by independent agencies or organizations. Individuals performing such services are often trained and certified to conduct monitoring. This level of project monitoring is also seen in some of the international carbon markets and can be expensive.

***Is the individual participating in other programs?***

Aquafondo should consider whether individuals who are receiving funding from other sources can also participate in the PES. If so, the Fund should decide which funding sources are compatible.

***Does the individual meet certification requirements?***

Aquafondo could consider implementing certification requirements for potential participants. However, this could create insurmountable barriers to program entry. Depending on the nature of the certification, this requirement could reduce program efficiency by excluding landowners who would contribute substantial conservation benefits.

***Can the individual provide matching fund support?***

Provision of matching fund support would help the program extend financing to more landowners and practices. However, a substantial cost share requirement would restrict participation and reduce efficiency by excluding landowners who could provide additionality. The need to supplement scarce resources should be weighed against the objective to include poor landowners and generate social benefits. Poorer landowners could contribute through in-kind support by volunteering their time. For larger projects such as multi-million dollar streambank restoration project examples cited in the K&A Phase I report, substantial cost share might: a) be necessary because of limited Aquafondo resources; and, b) serve as a threshold for Fund consideration.

## **Summary**

Several considerations for project and participant eligibility have been identified in other PES programs that will have applicability in the Aquafondo framework. Decisions on which ones and how these are applied will affect the types of projects that may qualify for funding, whether these match the Fund's objectives, if they are sustainable and whether they create additionality in both water quantity and water quality applications. As such, K&A recommends that Aquafondo: 1) review the array of criteria suggested here; 2) determine which of these may or may not apply to their organizational aspirations within the proposed operational framework; and, 3) test these against the current portfolio being developed. An initial set of eligibility criteria should be adopted for use in pilot project demonstrations. Depending on responses from program funders and recipients, this list can be adapted to better accommodate objectives and expressed needs.

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