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RESEARCH ARTICLE

Exploring the Potential of PPP in Philippine Irrigation

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Abstract: Irrigation systems in many Asian countries including the Philippines remain heavily dependent on public funds and are mostly unsustainable. Systematic degradation due to poor and inadequate management, maintenance and operation, and limited public funding calls for a new approach. Governments have implemented participatory irrigation management, which evolved into an irrigation management transfer (IMT). While progress has been slow, the IMT appear to present some improvements in the irrigation sector. However, the lack of incentives and motivation for irrigators associations (IAs) to become autonomous and irrigation agencies' unwillingness to let go further slows the growth of the irrigation sector. For the irrigation sector to grow fast and to provide the right incentives and policy environment for both farmers and IAs in the Philippines, the next logical step to take is a public-private partnership (PPP) between the responsible public agency and IAs. This paper explores the potential of establishing a PPP by empowering existing IAs beyond the IMT to become viable and sustainable private companies. This paper proposes four financial options for the irrigators associations-irrigation service management company (IAs-ISMC) to become more independent from public subsidies. These financial options are defined, which include doing community work beyond the PPP contracts to generate additional funds to the irrigation service fees (ISF). Necessary policy measures and institutional arrangements are proposed to enable the establishment of a start-up private company.

Keywords: Public-private partnership, irrigators association, ISF collection, Empowering, PPP in irrigation, management, operation and maintenance, *Weak* and *strong* PPP, *Soft-skill* and *hard-skill* works

JEL Classifications: Q13, Q15, Q18, H54

It has been over two decades since PPP has been introduced as an alternative procurement approach that taps into private sector expertise, technology, and capital (Darghouth, Tardieu, Prefol, Vidal, Plantey & Fernandez, 2007; Maskin & Tirole, 2008; Prefol, Vidal, Tardieu, Fernandez, Plantey, & Darghouth , 2006). At the early stages, PPPs have been focused on public works and eventually public utilities and social services (e.g., urban water supply, energy, transportation) with the private sector involved in the planning, design, procurement, technology transfer, implementation, and management. With private sector partnership, efficient allocation of resources and use of skills backed by innovative knowledge and ideas have been injected into the inefficiency-laden, poor quality services and often inadequately financed public works.

A successful PPP contributes to reduced public expenditure and improved institutional arrangements and processes. An ultimate goal for PPPs is to increase social benefit through a win-win partnership between the public and private sectors (hereafter, the two players). However, just as there are potential benefits, there are also associated risks. There is the risk of contract failure because most PPPs are inefficiently designed and not strictly bounded (de Bettignes & Ross, 2009). There is also the inherent concern of asymmetric information between the two players, which affects implementation and necessitates more effort and resources in supervision and monitoring. At worst, asymmetric information between the two players can lead to market and government failures.

The World Bank's (2013) recently completed a PPP study for the irrigation sector in the Philippines, which provides a framework for potential PPPs.[2] This paper examines in detail one of the options identified in the report and presents ideas to operationalize a PPP, benefitting from experiences from the field and inputs from key stakeholders. This paper also discusses the potential of a viable PPP between the public sector and IAs for management, operation, and maintenance (M-O&M) of irrigation systems. In this discussion, the National Irrigation Administration (NIA) is the public sector player.

Traditionally, both NIA and IAs have been in a close relationship in carrying out operation and maintenance (O&M) in irrigation systems. In these activities, both players have entered into M-O&M contracts under the Philippine IMT program.[3] We call this a *weak* PPP where one acts as the principal and the other as an agent. In this relationship, NIA is the principal actor and has a strong hold over the IAs. It finances all the capital expenditures and pays the IAs to perform some canal maintenance and user payment collection. In return, the IAs as agents perform contracted functions, get paid, and a share of ISFs with NIA using both the ISF and national government funds. Specifically, while benefits from irrigation are recognized, government-led provision has been laden with problems from design to implementation, to poor operation and inadequate M-O&M. As a result, systems deteriorate; irrigation sector performs poorly; farmers are unwilling to pay the service charge; and funds for M-O&M will be inadequate. A vicious cycle begins. Major rehabilitation or reconstruction will then be required. The same design and implementation problems will be encountered with government-provided irrigation service failing to use resources effectively and efficiently and farmers' needs not met.

Given the vicious cycle, it is worth considering other modes of providing irrigation service. The partnership between NIA and the IAs can be evolved into an expanded M-O&M and a *strong* PPP where NIA delegates more functions to the IAs. NIA will have a much-reduced role in M-O&M and even in financing irrigation development so it can devote more time and resources in ensuring sustainability through strategic technical and institutional support to farmers. A shift away from M-O&M activities will at worst not decrease cost; and at best, reduce the financial burden to NIA, the ISF, and national government coffers. The IAs' role and responsibility are increased; and there is a stronger motivation to provide farmers with high quality M-O&M services while maintaining the current ISF rates.

This paper will argue that such a strong PPP is the next logical step to the IMT for both NIA and IAs. If this strong PPP between the public sector and IAs will succeed, such a partnership can be scaled up to cover more irrigation systems in the Philippines and serve as a model for other Asian countries. For this strong PPP to be possible, IAs will have to be prepared and empowered. This paper discusses the preconditions for the establishment of such a strong PPP for M-O&M services in irrigation with empowered IAs, which can take on an expanded private sector role.

This paper consists of seven sections. Section 2 reviews the status quo and management issues of irrigation systems. It also discusses the trends in M-O&M activities, the performance of irrigation systems, including ISF collection efficiency, and incentives for M-O&M of irrigation systems. Section 3 focuses on empowering IAs for the establishment of a strong PPP. It discusses how to empower the IAs and enhance their organizational capacity for irrigation management. It suggests four conditions for an integrated approach for empowerment towards establishing an irrigation system management company (ISMC), which can qualify as a strong private sector partner. Section 4 contrasts the traits of a weak and strong PPP in terms of degree of independence from the private sector partner. This section also discusses the aspect of incomplete contracts due to uncertainty and asymmetric information. Section 5 lays down the requirements for an ISMC to meet financial requirements for the PPP by identifying four financial options and five scenarios. Each option and scenario is assessed in terms of likelihood and feasibility. Section 6 provides the institutional and policy recommendations for establishing the ISMC and implementing the PPP for improved provision of irrigation service. Lastly, Section 7 provides the conclusions and recommendations for a viable PPP for irrigation system management.

Current Issues in Irrigation Service Provision and M-O&M

Many irrigation systems in the Philippines and in the rest of Asia were constructed by governments and international donors in the 1970s--80s. Irrigation expenditure served as a major policy instrument to increase rice production to achieve food security. Many of these irrigation systems in Asian countries have now reached or exceeded their lifespan and require rehabilitation and modernization. Despite this trend, irrigation investments and spending by international donors slowed down (Svendsen & Rosegrant, 1994; Faures et al., 2007; Inocencio, David, & Briones, 2013). With diminishing marginal returns to farmers' input use in intensively cultivated irrigated areas, many countries removed input subsidies as part of their structural adjustment or liberalization programs. It was in this economic environment that farmers were asked to pay a higher absolute and relative share of irrigation costs.

With the decline of food prices since the mid-1980s, investments in irrigation also declined. Irrigation projects that followed were mostly rehabilitation projects. In more recent years, the Philippine government has been filling the gap by funding from the national coffers. With the shift to local funding, preliminary observation indicates deterioration in the quality of projects (Inocencio et al., 2013). Accumulated neglect or inadequate M-O&M has caused various problems around water distribution such as conflict of upstream and downstream, low ISF collection, and weakened collective action among farmers. Under these conditions, IAs have played their roles as supposedly independent organizations with own decision-making powers. Each IA has its own rules but follows the same general guidelines and principles for M-O&M given by NIA (NIA, 2008, 2011). The IAs recognize that there is an intrinsic incentive to do better M-O&M of the irrigation systems (Small & Carruthers, 1991). However, despite these potential benefits, most IAs are not in a position to implement the desired M-O&M without NIA's support, both technically or financially.

Despite the increasing trend in ISF collection efficiency, NIA still depends heavily on government subsidy. Subsidies, however, are not permanent or regular and, thus, are an unstable source of funding for corporate operations. As of December 2013, the average ISF collection rate was 66% for national irrigation systems (NIA, 2014). The ISF collections, however, cover on average about 40% of corporate expenses, thus, the national government continues to fill the gap in operational funds (Inocencio et al., 2013). Cablayan, Inocencio, Francisco, Saw, and Ureta (2014) reported that the key reasons for non-payment of ISF were poor service and inadequate water.

In this situation, the IAs are in a better position to influence and pressure the farmers covered by the irrigation service to honor their obligations. However, if the IAs are unable to sufficiently accomplish their M-O&M tasks, collecting the ISF and compelling farmers to become cooperative members would be difficult. The members of IAs are farmers themselves who depend heavily on public sector support. So, many IAs are operating without the full participation and

support of farmers while depending heavily on public sector support.

Many exogenous factors also affect M-O&M activities that constrain farmers and IAs in taking collective actions. These factors include high opportunity cost, absence of successors among the young, conversion of agricultural land to other uses, and less communication among farmers (CPRM Consultants, Inc., 2013; Cablayan et al., 2014). At present, farmers engage in better paying off-farm jobs instead of implementing M-O&M activities. If farmers will fully participate in daily M-O&M activities, they will be able to voice out freely their concerns and share ideas to address irrigation concerns through a dialogue among and between members. For example, the water distribution conflict between upstream and downstream can be resolved in a democratic way through a dialogue—that can be called "water democracy" (Yoshinaga, 2014; Shiva, 2002). This traditional approach to resolving issues provides communities with values that strengthen the fabric of the community and cultivate tradition, culture, and skills related to water concerns. It should be noted that M-O&M activities are not only concerned with the management of the irrigation system but also with the daily activities and livelihoods of the people in the community.

For its part, the public sector has provided different incentives in order to encourage IAs and farmers to promote M-O&M activities with their own initiatives (NIA, 2008, 2011). These incentives cover the farmers' collective actions for canal clearing (e.g., direct payments per 3.5 km of unpaved or 7 km of paved canals); IAs' efforts to enhance ISF collection efficiency (e.g., percentage shares in ISF collection when targets are exceeded); IAs' management of irrigation systems (e.g., specific awards and recognitions, exchange visits, training for IA officers and best performing farmers at the public sector's expense); and facilitation of access to the Department of Agriculture (DA) incentives and Land Bank of the Philippines' credit facilities (Cablayan et al., 2014). The key purpose of such incentives provided by NIA and DA is to motivate IAs and farmers to perform better M-O&M activities (Bagadion & Korten, 1991). However, these incentives do not appear to be effective in promoting independence from public sector support.

Empowering IAs Towards a Viable PPP

Organizing farmers to improve production began in the late 1960s but a more participatory approach to irrigation management started in the mid-1970s for communal systems. Given the favorable results of such approach, it was scaled up to national systems in the 1980s. As of December 2013, over 3,000 and almost 4,500 IAs in national and communal systems, respectively, have been organized (NIA, 2014). Overall, these IAs cover 78% of the area developed for irrigation (Inocencio et al., 2013). With the emphasis on participatory approach, resource allocation shifted from construction to irrigation system management. This shift in focus increased the *soft-skill* works component in irrigation projects, which required corresponding skills from NIA and the IAs (World Bank, 1994, 2001; Inocencio et al., 2013). This change has affected the activities, particularly those of IAs, at the field level. For IAs to be independent from the public sector, IAs and farmers should view M-O&M as their responsibility and not of the State.

The existing relationship between the public sector (or NIA) and IAs in implementing M-O&M activities can be defined as a weak PPP. The relationship is that of a principal-agent type where the public sector assumes the principal role and the IAs as the agent. There is asymmetric information between NIA and IAs in the implementation of M-O&M activities in the field. In this relationship, if the incentive provided by the principal is weak, the agent usually exerts a low effort for M-O&M activities. Thus, the IAs as an organization does not work to fully benefit farmers. Also, IAs is not a mature organization to bear the responsibility of M-O&M under PPP relationship. Yet, it is true that PPP cannot work well if there is asymmetric information between the principal and the agent.

Depending on the model believed to be most suitable, corresponding contracts can be drawn between NIA and IAs. The power balance in weak PPP is skewed to the public sector due to the financial support and authority given to the organization. If a weak PPP could shift to a strong PPP, some measures should be taken by both NIA and IAs. A strong PPP means that it is a legally identified contract and both sides are independent organizations authorized with sufficient administrative and technical capabilities for

M-O&M. In this sense, NIA as a government agency has developed its own capabilities on *hard-skill* works and soft-skill works on irrigation matters; and has experienced and encountered various financial and technical problems in the past. As a partner of PPP, NIA could be a potential candidate as the public sector while the IAs' capability as the private sector is not enough in terms of financial and technical expertise. At the present status of IAs, it is difficult to play the role of the private sector in a strong PPP.

Given this situation, the IAs have to be empowered to increase their capability to become a qualified organization for a strong PPP.[7] Based on the definition of PPP[8] stated earlier, we introduce a strong PPP as a variant to the existing PPPs, in which NIA represents the public sector and IAs as the private partner for M-O&M services. It is defined as "a partnership based on a contract between NIA and IAs (ISMC, defined below) on the provision of M-O&M services in an irrigation system in exchange for a management fee or revenues from operations (ISF)." The contract at this stage excludes hard-skill works such as rehabilitation and modernization that are still under the responsibility of NIA. Currently, IAs are not equipped with individual and collective assets in terms of financial and technical expertise to work towards a common goal. Moreover, many IAs are incapable of efficient and effective M-O&M due to the lack of full cooperation of its members.

As to the approach to empower IAs in terms of organizational and operational capacity, an integrated strategy may be needed. IAs have to challenge the status quo and meet several conditions which include independence from the public sector, establishing ownership of assets, financial capacity through improvement of ISF collection, and strengthening of organizational authority and responsibility. These four conditions are interrelated and can be part of an integrated approach to empower the IAs. Firstly, upon the establishment of a strong PPP, IAs should be financially independent from the public sector. It can be paid based on a clear contract with the public sector. Secondly, IAs can foster a spirit of ownership in fully managing the irrigation system, recognizing the system as its own asset, which could produce profits with efficient use. The IAs can take the lead and encourage farmer members to participate in establishing such ownership.

Thirdly, financial viability and resource management is a difficult issue given that the ISF is the only source of income for most IAs. Given the low ISF collection, the corresponding shares that IAs can get from NIA for M-O&M activities will affect the IAs' financial position. In order to break this cycle, it is imperative that the ISF collection be improved. At the same time, IAs can negotiate with financial institutions such as the state development bank, for possible investment in IAs' activities as a private sector borrower. In this negotiation, the public sector will be in a position to provide a guarantee against financial failure of IAs. This guarantee can substantially influence securing of investment from development banks.

Lastly, many IAs have yet to succeed in establishing some authority and autonomy because of their heavy financial and technical dependence on the public sector. If the IAs cannot generate their financial resources, they will continue to be constrained by the public sector's decisions and actions and cannot be expected to grow and become financially viable. In addition, IAs will have less incentive to professionalize and operate efficiently and effectively.

PPP Establishment with Full Participation of IAs

As pointed out earlier, a strong PPP is different from the existing program of IMT (NIA, 2008, 2011), which is being implemented by NIA in over 200 national irrigation systems in the country.[9] The IMT aims at transferring operation, maintenance, and management to IAs and reduce the role of NIA especially in models 3 and 4. For the IMT to be successful, it is a prerequisite that the IAs take some initiative with the participation of farmers, an approach which takes off from the relatively favorable experience on participatory irrigation management (PIM), which was introduced in the 1980s (Araral, 2005; Meinzen-Dick, Raju, & Gulati , 2002; Raby, 2000; Vermillion, 1997). In implementing IMT, the public sector still provides substantial financial support to IAs and the national irrigation systems (Mejia, 2002). In this paper, we propose for the IAs to take the role of the private sector and to have the financial and technical capacities to provide the M-O&M services.

If the IAs will succeed in establishing a viable private company[10], we shall call this the Irrigation

System Management Company (ISMC). If the IAs are integrated and organized into one private company, this can be effective in strengthening the fabric of an organization and can incorporate different but useful skills and knowledge for the management of an irrigation system. In this case, the ISMC becomes a potential candidate as the private sector partner in a strong PPP for M-O&M. Once the ISMC is established, its mandates and guiding principles should follow the government rules and regulations for private companies.

The next action to be taken is to establish a clear relationship between the ISMC as a service provider and farmers as recipients, who in turn, will pay for the services. The farmers are obliged to pay for M-O&M services in the form of an ISF. In this scheme, NIA plays a catalytic role in collecting the ISF and reimbursing the ISMC for its M-O&M expenses. Two ISF collection options can be defined. One option is to include it in the M-O&M services by the ISMC. The other option is for NIA to remain responsible for collection but assisted by IAs. In the latter option, the ISMC shares the responsibility by taking care of campaigning for ISF payment and persuading farmers to pay their ISFs. Whether these contracts can improve the ISF collection will directly affect the future of the PPP contract with the ISF as a major, if not the only, source of income.

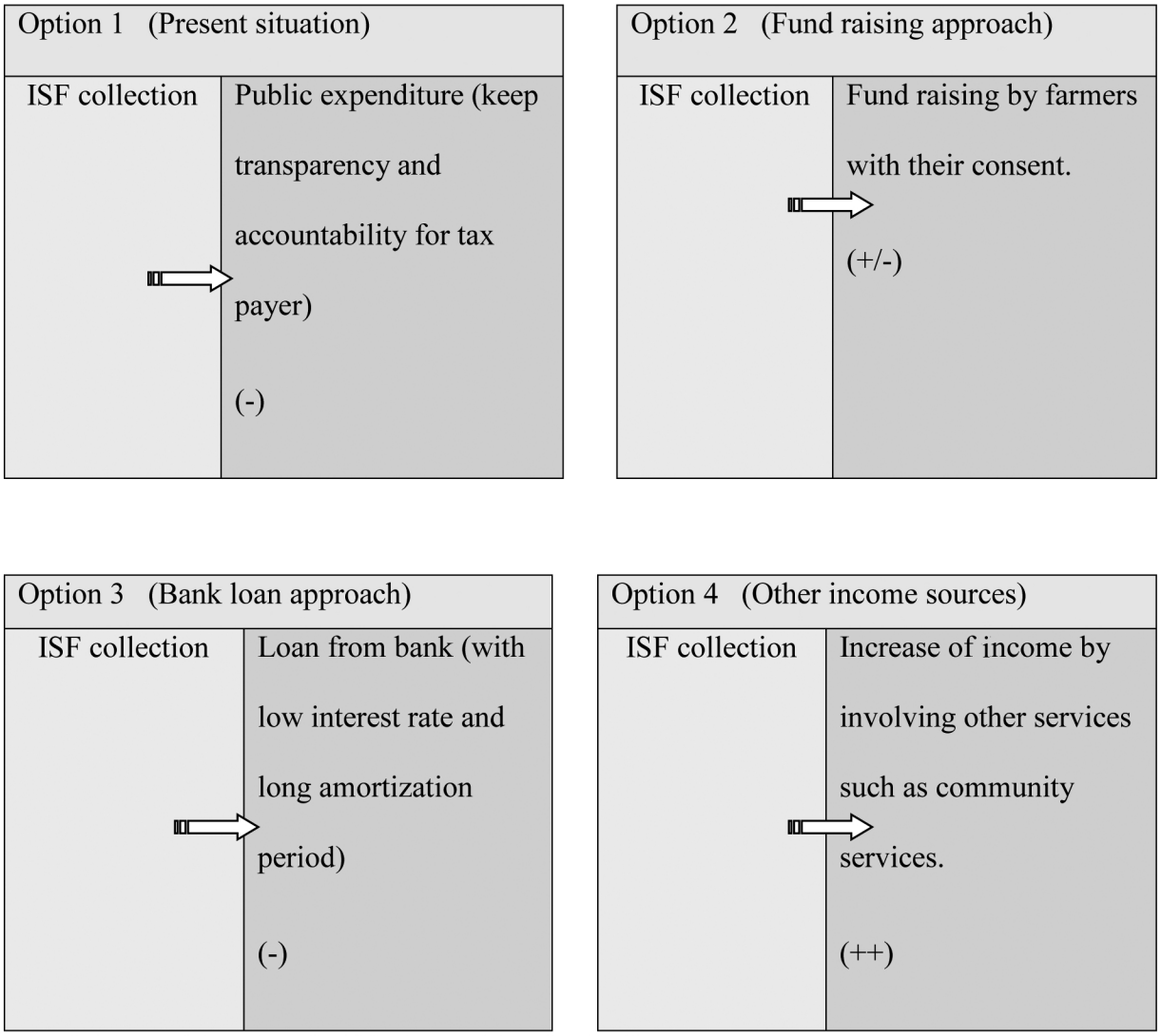
The PPP contract between NIA and the ISMC will be incomplete because it cannot cover explicitly all possible contingencies as the M-O&M services cover soft-skill work such as daily maintenance, operation, and management of irrigation facilities which are difficult to monitor. An incomplete contract on soft-skill works adopts a lump-sum payment if both parties agree to such a payment system. However, the lump-sum payment induces the ISMC to underperform and this will be difficult to establish because of information asymmetry. This is the moral hazard problem in the principal–agent relationship. The agent (ISMC) may have an incentive to act inappropriately (from the viewpoint of the principal, NIA) if the interests of the agent and the principal are not aligned with each other. The information between the principal and the agent on the degree of achievement of soft-skill works like the M-O&M services is asymmetric. The PPP can break down. To avoid the moral hazard problem, both parties need to have an open communication and transparency on the progress of work and accomplishments.

As a future development, the ISMC can consign part of M-O&M activities to existing IAs through a sub-contract that covers such services as regular inspection of the conditions of the irrigation facilities and monitoring and implementing of timely and adequate irrigation service. These activities have traditionally originated from their water management practices, which are also linked to collective actions involving farmers. This approach can contribute to the deepening of local culture, customs, and traditions with linkages to water including biodiversity and ecosystem preservation, some of which play roles as a local public good. A commission of such water management linked closely to local peoples' livelihoods to IAs is effective to preserve local culture and tradition as an asset that provides a society as a whole with ingrained values. This is one of the important tasks and effective soft-skill works of PPP with participation of the ISMC.

In the case of NIA, investment has been gradually reduced after the peak of construction of irrigation infrastructure funded by international donors in the late 1980s. At the same time, NIA has weakened its authority at the national level and popularity among taxpayers waned. On the other hand, many irrigation facilities have deteriorated with the passage of time. Accordingly, NIA has gradually shifted main works from hard-skill works to soft-skill works of M-O&M. The budget for M-O&M, by nature, has been limited together with a low rate of ISF collection, under which situation NIA has suffered from providing high quality of M-O&M services at the field level. In this situation, the status quo is more or less the same as before and has not changed much, as expected.

In PPP establishment, NIA as the public sector is responsible for arranging various procedures. As in the first case of PPP involving IAs as the private sector of ISMC, NIA should pay particular attention to the qualification of ISMC in terms of financial, administrative, and human resource management. In this case, NIA has to have the capability to screen the qualification of the ISMC as a partner of the private sector. In reality, however, NIA is in the position to get sufficient information on the ISMC's O&M track record and how to empower the ISMC to operate as a private company.

On the other hand, NIA is also responsible for empowering the IAs to become the private sector partner in a PPP by conducting field training and organizing special courses on financial and



Note: The arrows are used to denote the effect of ISF collection on the need for supplementary funds. A negative (-) effect means that an increase in ISF will reduce the need for alternative funds. For a positive (+) effect, an increase in ISF will encourage investment by farmers or provide the capital (labor and other inputs) to generate more income.

Figure 1. Financial option for ISF in participating PPP.

administrative management. In fact, NIA knows the strengths and weaknesses of the IAs as a candidate private sector partner. These weaknesses include: less work experiences as the private sector, difficulty in accessing investment and capital formation, a lack of human resources, and uncertainty of independence with autonomy and ownership. NIA, within a scope of given authority, can help IAs to improve their situation. For instance, NIA can encourage IAs to recruit professional staff in negotiating a bank loan and support their independence by setting legal and institutional procedures. As to their strengths, there are accumulated knowledge and skills on M-O&M activities—familiar to farmers who belong to IAs—and data collection on irrigation facilities necessary for M-O&M including rehabilitation. NIA can empower the IAs to become a viable private partner in a PPP.

Financial Resources and Viability

The continuing government support to IAs comes from at least two sources—the ISF and government

subsidies. If the IAs-ISMC will be the private partner in a PPP, it will be highly dependent on the ISF as a key source of funding since the public sector reduces or discontinues its M-O&M support. This section defines the four financial options for the ISMC partner in a PPP (Figure 1). Option 1 represents the status quo, while Option 2 raises some funds from farmer-members. On the other hand, Option 3 secures a loan from a bank and Option 4 generates revenues through community development and entrepreneurial activities.

Under Option 1 with low ISF collection rate, shortage in the annual M-O&M budget is covered by national public expenditure using taxpayers' money.[10] This situation has been the case since NIA began its operations although IAs have taken several measures to oblige farmers to pay their ISF. In Option 1, the challenge of the ISMC is to improve ISF collection efficiency so it can build its own capital and reduce public support.

If IAs are to form an ISMC, they need a start-up fund to finance setting-up operations as a private company and getting into a PPP contract. In Option 2, farmers will be asked to share a certain amount to invest into the ISMC. In this option, it is a prerequisite to get the consensus among farmers to set up the private company and their cooperation to raise funds. The IAs can issue an authorized bond with a guarantee certification, and for farmers to purchase the bond given their financial capacity. This approach will create a different principal-agent relationship where the farmers as a group will play the role of principal and the ISMC as agent, supervised by the farmer-shareholders. This option, however, may be difficult to realize for two reasons. First, not too many farmers may have the financial resources to buy shares in the company. Second, assuming there are interested farmer-investors, they will have to be convinced that the ISMC will be viable and profitable.

Option 3 is to secure a loan from a commercial bank, which implies satisfying all requirements for the borrower and following bank procedures. The bank may take a risk-averse position so that the ISMC will need to mortgage something to secure a loan.[11] The problem with this is that the ISMC may not have a property to mortgage and may end up using assets of some individuals, if they are open to lending their assets to the ISMC. This option, however, is more feasible than the Option 2 if the ISMC will qualify as a borrower. However, the size of the loan might be limited to start-up work of the ISMC and may require strict feasibility analysis to minimize the probability of failure. Finally, Option 4 considers a future possibility of expanding services of the ISMC to improve its financial position.

Given these four financial options, five scenarios are presented to illustrate the costs and benefits consideration. Scenario 1 (IMT Model 1) is a business as usual case, which focuses only on M-O&M services. Scenario 2 (IMT Models 2 and 3) is for expanded services covering partial hard-skill works, mainly simple rehabilitation work such as repairing damaged gates and rebuilding of damaged part of concrete canals. Scenario 3 (IMT Model 4) is for expanded services covering full hard-skill works, and Scenario 4 includes some community-related work. Scenario 3 covers all rehabilitation, possibly including modernization work in the irrigation system, which needs sub-contracting with a construction company. Scenario 4 extends the ISMC services to cover water-related work in the community such as cleaning side-ditches along a road, management of wetland and water pond, which are beyond the scope of the PPP services.[12] Finally, Scenario 5 describes a final stage where the ISMC becomes a full-pledge private company, which can be involved in full M-O&M services under a competitive contract beyond the PPP. Figure 2 shows the progressive scenarios for the ISMC services under and beyond the PPP.

Lastly, the relationship between the financial options and scenarios are discussed. Both are closely linked to the establishment of the ISMC and its participation in PPP. Table 1 presents the financial options under various scenarios, prioritized according to the likelihood of being adopted. Option 1 is given a high priority as a source of finance. It requires that the ISF collection be increased, otherwise, the ISMC will encounter financial problems. If Option 2 is realized, the ISMC can be financially independent and can expand its activities. However, it may take time to get the farmers to understand the value of investing in the ISMC. This option is given a low priority as a source of finance because of lower expectation of farmers' participation. Option 3 is possible and can be a stable source of financing with high or moderate priority if the ISMC has the management capacity and appropriate insurance for specific cases of failure can be obtained.

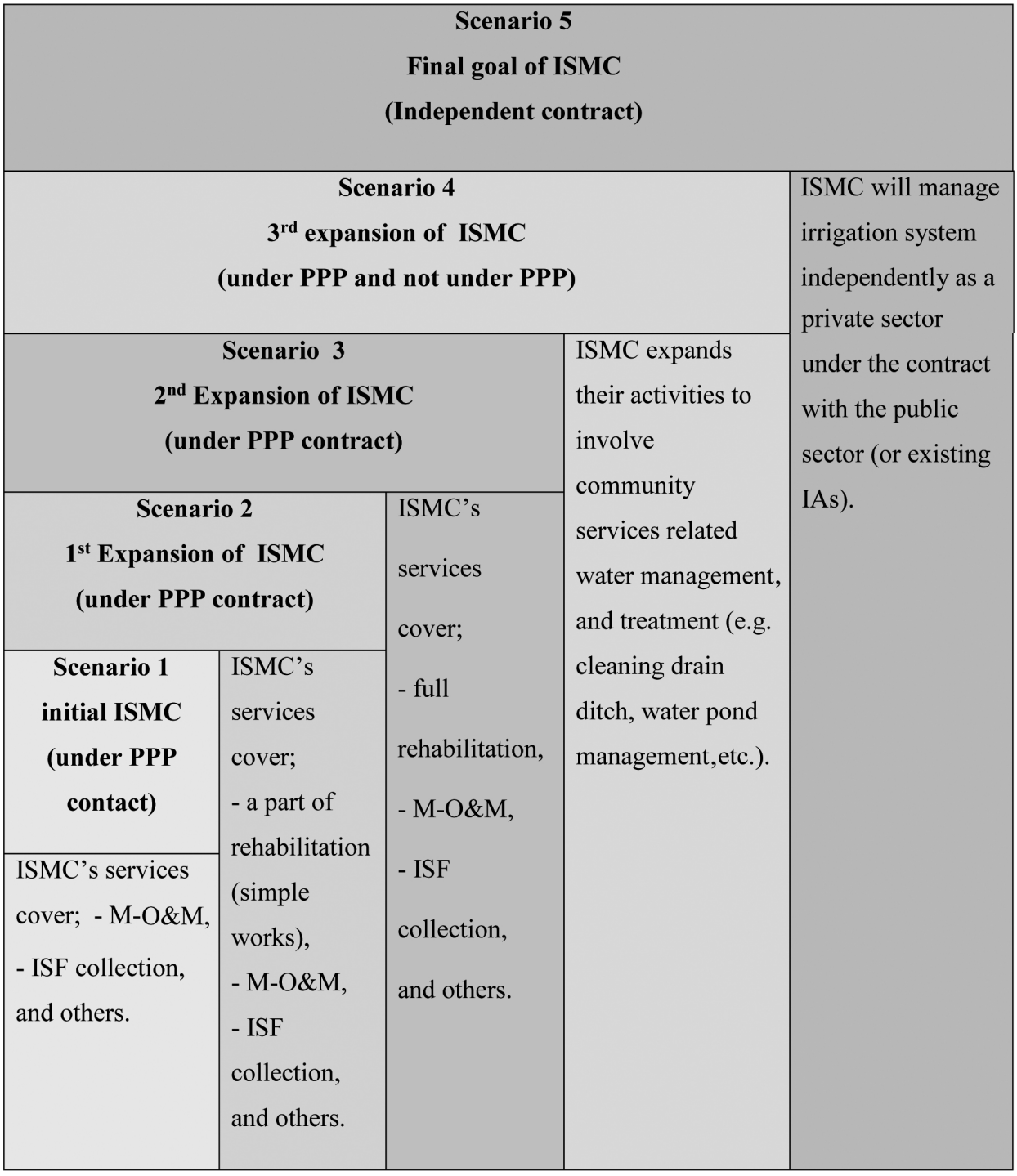


Figure 2. Evolutionary scenarios of ISMC services under and beyond PPP.

If the bank gives the loan, the ISMC can expand its activities to cover part of hard-skill works. Option 4 is not under PPP activities but with high priority if the ISMC services are closely linked to community development activities that are income generating and that can create employment opportunities.

Policy and Institutional Arrangements

It is a challenge to establish PPP between the public sector (NIA) and the ISMC for M-O&M in irrigation service. This direction requires that accompanying policies and institutional arrangements be put in place

Table 1. *Main Points and Priority in Financial Option for ISMC*

	Main points	Related Scenario	Priority
1	Current situation with public expenditure without any clear agreement of taxpayer. Need to increase ISF collection in order to reduce public expenditure through PPP.	Scenario 1	High
2	It needs farmers' agreement and consensus on the contribution for fund raising. It depends on economic situation of farmers and requires guarantee for failure case of ISMC.	Scenario 1 and 2	Low
3	Government guarantees the bank for failure case of ISMC. It needs institutional arrangement for involvement of government in contract ISMC and the bank.	Scenario 1, 2, and 3	High/ Middle
4	Future possible development of ISMC could succeed PPP and be further empowered as a private company. It is useful to link ISMC activities to community development.	Scenario 3 and 4	High

in order to facilitate the establishment of PPP. This section discusses the necessary policy measures by the public sector and institutional arrangements for both the public and private sectors for purposes of specific PPP establishment. Policy measures to be taken for supporting PPP establishment covers mainly fostering human resources by empowering employees of IAs. For example, the public partner can commit to some continuing support for specific training programs, linkages with different government agencies for specific complementary interventions, and facilitation of private sector forward or backward linkages, among others. Training programs can include risks management, innovative financing, and application of new technologies. The public sector needs to make procedures and qualification requirements clear for IAs in PPPs through several rounds of orientation workshops and consultations. With regards to budgetary support, it may be limited to a start-up fund with a low interest rate and a long amortization period. This support requires an evaluation of the private company, which includes the financial capacity to amortize the fund within a specified period.

The existing policy measures are inadequate in enabling IAs to evolve into a viable private sector partner in a PPP. Thus, it is incumbent upon the public sector to increase awareness, understanding, and appreciation of PPPs, particularly in irrigation. The public sector can do a massive information campaign, which includes why PPP is considered, the options, various associated risks, costs and benefits, roles of different parties in decentralization, and policy implications. By taking existing policy measures on PPP into account, there is a need to review all present policies and legal environment and propose appropriate changes in order to prepare entry of an IA-managed private company in a PPP.

On the other hand, with regards to institutional arrangement, there are various issues that need to be addressed by both players. First is how to evaluate the performance of the agents in a PPP contract of M-O&M, which becomes the basis for payment. The evaluation of achievement depends on an objective standard where a common checklist can be used for a fair evaluation. The PPP goal and measurement of performance are closely linked to avoid "moral hazard" where there is asymmetric information between the public sector as the principal and the private company as the agent. For instance, the scope of maintenance work can be clearly defined to avoid non-performance or systematic neglect to eventually pass them off as rehabilitation work. Performance of soft-skill works such as a conflict resolution among farmers, continuous skills improvement, and accumulation of knowledge that improve management capacity may also be difficult to evaluate. However, conflict resolution is one of important soft-skill works, which is closely linked to water management practices, thus, better maintenance action by farmers can be used as a proxy measure. In the end, both parties will simply have to agree on an evaluation standard and how to measure performance to minimize ambiguity. A guidebook

covering bidding and contracting procedures, clearly defining functions and allocating risks, performance standard and measurements, and payment procedure will be needed.

An important provision in a PPP contract is on ISF collection, which is part of the soft-skill in M-O&M services. The payment of ISF is an obligation for farmers who benefit from irrigation water. However, in most national irrigation systems, the current arrangement is for farmers to be liable as long as they harvest above 40 cavans of palay per hectare (Cablayan et al., 2014). However, there is no written contract between NIA or IAs and the individual farmer on how much water is delivered. There is some sort of "a gentleman's agreement" which in fact adds to the difficulty in collecting the ISF.[13] Also, the prevailing ISF rates are not linked to actual maintenance, operation and management expenses, and amortization for the construction of irrigation facilities.

Under the present situation, the involvement of the ISMC in ISF collection will be limited to encourage the farmers to pay the ISF through persuasion and peer pressure. Whether or not the ISMC can enhance the ISF collection efficiency is heavily related to a continuing PPP contract, and the implementation of the M-O&M services. It is necessary to make farmers understand that M-O&M services cannot be continued without their ISF payments because it is a key financial source for the PPP contract. Farmers need to realize that public funds, which are currently supplementing the ISF collection, are never a regular and stable source of financing and are subject to national priorities. Finally, the public sector has to be ready with alternatives in case of failure of the ISMC due to lack of management funds or capacity to implement the M-O&M services contract, and a low risk management against exogenous shocks such financial and natural disasters. One option to avoid the risk of this management strategy for the public sector is to require some performance bonds[14] for the ISMC to insure against management failure. Yet, in general, the uncertainties in irrigation and agriculture and lower expected profits will push the ISMC to take a risk averse position.

Conclusion

With the slow progress and mixed results of IMT implementation, this paper proposes a way forward. Specifically, it discusses the possibility of establishing a PPP between the public sector and an empowered and strengthened IAs through a private company, the ISMC. With existing challenges in irrigation system management and sustainability, public spending for this sector needs to keep up. However, with also rising demands by other sectors on government resources, other options will have to be explored. A new form of PPP between NIA and the ISMC is one such option. There are pros and cons for this form of PPP. It is imperative for IAs to take on a broader role in the management of irrigation systems as key beneficiaries. The present form is not sustainable given the vicious cycle of inadequate financing, weak M-O&M, and poor irrigation service and sector performance.

The present capabilities of IAs in terms of organizational, functionality, and financial aspects are too weak to qualify them as a private partner in a PPP. Historically, most IAs have been heavily reliant on public sector support and without decision-making powers based on a strong ownership and initiative. Empowering IAs beyond the IMT is a prerequisite for them to participate in a strong PPP. Necessary measures should be put in place to prepare the IAs for such increased roles which cover human resources, financial, administrative, and business management including risk control and getting appropriate insurance coverage to shield IAs from failures. Financial capacity and management are most critical concerns for IAs to become viable and independent from public support. This paper suggests four financial options, which include measures to increase the ISF collection, extending credit to IAs, encourage direct investments from farmers as shareholders, and generate additional incomes from related community works. The paper also highlights the necessary support of the public sector for the start-up stage of the ISMC. A sound financial arrangement is a necessary condition for the ISMC to become a competent partner in a new type of PPP in the irrigation sector.

The other necessary conditions are appropriate policy and institutional measures for the establishment of a strong PPP. These measures will focus on empowering the IAs and laying down the legal foundation for IAs to establish the ISMC and enter into a PPP contract with NIA. Upon the PPP establishment, the public sector will have to evaluate different management approaches in terms of who will be responsible for

which functions, how to share the management costs and how risks will be shared. On the potential evolution of the ISMC services based on five scenarios, the goal is for ISMC to be an independent private company beyond the irrigation PPP and participate in other contracts through a competitive bidding system. To this end, the ISMC needs empowerment beyond the IMT and guidance towards the establishment of PPP and increase awareness and appreciation of farmers of the goals and direction of the ISMC. The public sector will be responsible for ensuring transparency in the whole process and keeping accountability for public expenditures.

Finally, there are still several research areas this paper is unable to cover. These areas include detailed cost-and-benefit analysis in establishing PPP in irrigation system management, making the most of incomplete contract under prevailing asymmetric information, particularly in soft–skill works of M-O&M contract, and determining the ISF rates that will be consistent with the PPP option.

Notes

[12] PPP refers to a range of possible contractual arrangements (long-term) between the public and the private sectors targeted towards financing, designing, implementing, and operating infrastructure services and facilities that were traditionally provided by the public sector (Public-Private Partnership Center, 2012). The authors adapt the same definition of PPP in this paper.

[3] The IMT is aimed at the following (NIA, 2008): (1) establishing duly organized and functional IAs; (2) improving performance of the NISs including equitable water distribution, timely and reliable water deliveries, higher irrigated cropping intensity, and higher collection efficiency of ISF; (3) creating opportunities to NIS farmers for better and more profitable agricultural production; (4) contributing to the sustainability and financial viability of the IAs and the overall O&M of the NIS; and (5) contributing to the sustainability and financial viability of NIA.

[4] The World Bank defines empowerment as "the process of enhancing the capacity of individuals or groups to make choices and to transform those choices into desired actions and outcomes. Central to this process are actions which both build individual and collective assets, and improve the efficiency and fairness of the organizational and institutional context which govern the use of these assets" (World Bank, 2013, p. 6).

[5] The BOT Law allows NIA to take on the public sector role in a PPP contract where it is responsible for irrigation development including rehabilitation and modernization of irrigation systems, while the private sector can be responsible for the delivery of irrigation service. NIA retains the ownership of the dam and irrigation facilities while the private sector bears the financial risk of M-O&M services. The private partner can contribute managerial efficiency to reduce M-O&M costs, and to ensure longer rehabilitation cycle.

[6] Four IMT models are defined in NIA IMT Implementing Guidelines (NIA 2011): In Model 1, NIA manages the entire NIS but transfers specific operation and maintenance activities to the IA. In Model 2, NIA manages the main system from the headworks to the main canal up to the head gates of lateral canals and transfers to the IA the management of the laterals, sub-laterals, and terminal facilities. In Model 3, NIA manages the headworks and portion of the main canal up to the junction of the first lateral canal and transfers to the IA the management of the rest of the system downstream of the specified junction. In Model 4, NIA completely transfers to the IA the management of the entire system including the headworks and stops all its activities on directly managing the system.

[7] Currently, there are councils of IAs in large irrigation systems. A council has been responsible for M-O&M in an irrigation system as a private, non-profit organization.

[8] Several reasons have been given on the low rates of ISF collection, that is, poor irrigation service and lack of water (Cablayan et al., 2014).

[9] At present, the Land Bank of the Philippines (LBP) has been offering "sikatsaka," a financial assistance program for irrigators associations aimed to provide rice production support. However, there are not too many takers and those which did, mostly defaulted. The LBP is shifting to qualifying individual farmers instead of IAs.

[10] These services further include rice trading and sale of farm inputs, rice milling, drying, providing credit, and trucking services.

[11] In a few irrigation systems in Mindanao and the Visayas, the IAs and NIA require a "request for water" signed by the farmer as written proof of provision of irrigation service.

[12] A guaranty from a third party guarantor, either a bank or an insurance company, submitted to a principal by a contractor, which ensures payment of a sum of money if the latter fails to fully perform as specified in the contract.

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