A Different Approach to Investing in the Restoration and Protection of the Delaware River Watershed

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I. Introduction

Institutions like the William Penn Foundation play a critical role in natural resource restoration and protection efforts through their support of new and successful programs, projects, and conservation initiatives. However, ensuring the Delaware River watershed is a safe and reliable water resource in the long-term requires the philanthropic investments to be catalytic in nature, spurring further investments from the public and private sectors.

With funding from the William Penn Foundation, the Environmental Finance Center (EFC) at the University of Maryland led an 18-month project called the Innovative Financing Panel. This project sought to identify how philanthropic capital can leverage private capital to achieve greater watershed health. Essential to the project was a panel of 12 experts, representing multiple disciplines (science, finance, policy), interests (conservation, agriculture) and institutions (local government, universities).[1]

Charged with identifying new ways of mobilizing capital and investment in watershed restoration and protection, the project began with a focus on the mechanisms to finance and/or fund watershed activities. Mechanisms for deploying capital are varied, falling on a continuum from grants to loans to investments. Our research, however, quickly concluded that existing instruments (eg, grants, loans, guarantees, etc.) for deploying, combining, pooling or stacking multi-sourced capital are sufficiently robust and applicable to watershed restoration. As a result, the research turned to assessing where capital flows and the market dynamics that direct this flow. A key finding is that innovation arises in how philanthropic capital is uniquely placed to create opportunities and partnerships across sectors. It can become the bridge for advancing watershed restoration and protection outcomes that are embedded in market based transactions and activity. This finding is not calling for philanthropic capital to support the development of environmental markets such as water quality trading. Instead, it calls on philanthropic capital to strategically invest in business and investment activities that have environmental performance (ie, restoration or protection of water resources) as core values guiding the design and delivery of services and products.

> ***Existing instruments for deploying capital are sufficiently robust and applicable to watershed restoration. Innovation is in the partnerships not the mechanics.***

[1] Appendix A provides a list of panel participants.

Project approach

The EFC followed a three-step process to develop recommendations. The first step involved reviewing a rich body of literature that evaluates the opportunities and challenges facing financing and funding mechanisms utilizing capital from private, public, and nonprofit sectors. This literature review was expansive, covering peer-reviewed journal articles, white papers, thought pieces and reports produced by foundations, investment firms and nongovernmental agencies. It sought out insights from areas and markets that are directly related such as philanthropic grant-making and program-related investments, social and environmental innovation, green entrepreneurism, market-based strategies and incentives, impact investing and private-public partnerships. The EFC considered these concepts across various sectors and social missions beyond conservation and the environment, including areas such as energy, education, and economic development.

The EFC then explored and expanded this research through stakeholder and expert interviews. The interview process was comprehensive. We actively sought the insights of individuals and organizations across sectors, to better understand the perspectives and barriers to financing watershed work. For example the agriculture sector research went beyond conservation and farm interest groups to also engage value chain coordinators, community bank representatives, farm accountants and estate planners.

Based on the findings from the interview process, the EFC convened two forums to vet and evaluate financing options and our investment diagnostic, where participants provided a systems perspective. The forums brought together thought leaders from inside and outside the Basin, representing government, conservation finance, impact investing and private sector service deliverers. The aims of these forums were ambitious. Participants directly tackled barriers, confirmed salient characteristics of target investments or partners, and began the selecting approaches that had potential to leverage philanthropic investments. The forums confirmed the importance of a holistic process and revealed options that moved beyond current practices.

Structure of this report

This report sets outs the project findings. Chapter 2 discusses why and how philanthropic capital has an important role in leveraging private capital. The next chapter provides a framework for evaluating when leveraging private capital is appropriate. Chapters 4 and 5 discuss our findings specific to stormwater and agriculture, respectively. The final chapter summarizes the project's key findings and recommendations.

Appendices provide further detail. They describe the interview and forum process for engaging stakeholders and experts.

2. A Different Way to Invest

The philanthropic sector alone does not have enough capital to solve all the hard problems. Achieving strong, lasting solutions needs more than just growth in the scale and capacity of initiatives. It also needs innovation in the capabilities of organizations that deliver environmental services. For example, the William Penn Foundation has made a significant commitment ($35 million over three years) to watershed protection. This level of investment, while substantial, falls short of the Delaware River Basin's needs. Over the same three-year period, the Foundation's network of nonprofits, local governments, universities, environmental groups and other partners identified funding needs in excess of $230 million.[2] Documented in implementation plans, these activities do not provide a clear indication of what it would take to achieve full restoration and protection; rather they characterize the types of activities necessary to protect and maintain current conditions.

Investment from any one sector is not enough to restore the watershed health. Over a 3-year period, a network of organizations identified over $230 millions of funding needs to address the Delaware River. But, it is not clear how much improvement would be delivered or how much more it would take to protect these gains.

Foundations – like the William Penn Foundation – need strategies to attract additional resources and new partners. They need leverage from new sources in order to bridge the funding gap that exists between the needs and the available philanthropic resources. Philanthropic organizations have a long history of partnering with the public sector. However, its engagement with the private sector offers potential that has been less explored – especially as the number of impact investors and socially responsible entrepreneurs rise.

Foundations have long depended upon grant making as their primary methods for directing resources addressing mission objectives. Over time, program related investments (PRI) have emerged as a second, but equally important, method. PRI offers a way for foundations to meet their mission and leverage their financial resources. It is a platform for engaging the private sector, attracting investors, and ideally capitalizing on market efficiencies and innovation. PRI follows a similar process to that of grant making. Funding is mission driven but deployed as an investment offering a modest (and potentially risky) financial return. This low rate of return allows PRI to be flexible rather than prescriptive in terms of its time horizon, risk profile, or

[2] Source: 2nd Annual Delaware River Watershed Forum, October 21, 2014. Remarks presented by Clare Billet

investment vehicle. However, by design it is required to generate a below market rate of return that meets IRS requirements.

The distinction between loans and PRI is blurred with mechanisms that mix the two, such as loan guarantees, linked deposits, and revolving funds. These mechanisms can also play a role in social impact bonds, green bonds, pay for success, and other private-public partnerships. They demonstrate how the public sector is experimenting with private sector collaborations to deliver public services and outcomes cheaper, more efficiently and more effectively in portfolios beyond forestry, infrastructure, and utilities.

Nonprofits and environmental groups offer models for leveraging private capital and market forces to deliver environmental and natural resource protection and/or services. These types of projects occur opportunistically (eg, a project-by-project basis as seen in the TNC & GoldmanSachs collaboration for DC Water to deliver green infrastructure), more systematically (eg, as seen in on-going partnerships between NatureVest and Encourage Capital), or through mission-driven business models (eg, nonprofits like EcoTrust offering investment and consulting services). The assimilation of investor and market instruments reflects not only innovation but also cross-fertilization of human capital and expertise as private sector individuals and leaders cross over to the nonprofit world.

Figure 1. Challenges of a Grant-Driven Process

Often complementary to the public sector's activities, foundations direct funding to activities that either reinforce or fill gaps in local, state or federal regulation and policy. They direct funding through a strategic, grant-driven process that focuses on service delivery rather than capacity and capability enhancement. The grant process typically funds specific projects, requiring demonstrated success over short time horizons and limiting support to organizational growth. Only 10% of foundations reported multi-year grant making in a recent assessment.[a] Little, if any, of the grant monies can be used for enhancing or expanding the organizational capacity or delivery capabilities of the organization. One study finds that annually, only 16% of foundation giving supports general operations.[b] This type of funding constraint limits cross-fertilization and connections across networks of organizations. Grant recipients struggle to secure resources (eg, staff time) to support their efforts to leverage and pool funding (typically in the form of cost-share or partnership requirements). These factors weaken the stimulus potential of philanthropic grants and potentially undermining the sustainability and adequacy of foundation investments to deliver long, term, self-sustaining societal outcomes.

Source: [a] Grossman, Allen, Sarah Appleby and Caitlin Reimers (2013). "Venture Philanthropy: Its Evolution and Its Future", Harvard Business School. N9-313-111. Revised June 13. [b] *Ibid*.

Seeking leverage needs to move beyond social impact investing & PRI

For foundations to use their capital as leverage with private capital and private partnerships, they need to push the envelope of existing financing and partnership models (as seen with conservation finance and impact investing more generally). Private capital markets are projected to deploy $5.6 billion to conservation impact investing over a five-year period (2014-2019).[3] This scale of investment signals a sizable and serious interest by financial markets to deploy capital that is touted as creating "positive impact beyond financial return."[4]

Despite this growth, investors consistently report the supply of investment-ready projects is not keeping pace with demand.[5] A number of reports on conservation finance and impact investing echo similar views.[6]

The limited supply of projects primed for social impact investment is not surprising. Impact investing in its current form employs traditional models and rules to guide investment decisions and maintain competitive rate of return. Looking across three specific areas of conservation investing – sustainable food and fiber production, habitat conservation and water quantity/quality conservation – investors generally reported little to no tradeoff between returns and impact.

Ample demand and capital exists but not enough is being directed to early-stage market development. Impact capital is largely deployed to deliver services rather than foster innovation and capacity – leaving a much needed and vital role for philanthropic capital.

The view that impact investing does not compromise market returns aligns with how capital is deployed. (See Figure 2.) The overwhelming majority of capital goes to projects in mature investment stages: 71% was invested in real asset purchase, with an additional 16% in mature companies. Only 4% was invested in growth stage opportunities; and less than 10% of the deployed capital between 2009 and 2013 was invested in growing the potential supply of opportunities (eg, angel/seed stage through to project finance/development). Investors are deploying capital to projects with familiar risk profiles, because they are unwilling to compromise "market returns" while supporting positive social impact. Later investment stages, by definition, have less risk and reflect mainstream investments.

[3] NatureVest and EKO Asset Management Partners (2014). *Investing in Conservation: A landscape assessment of an emerging market*. November.
[4] J.P. Morgan (2010). *Impact Investments: An Emerging Asset Class*. Global Research. 29 November.
[5] *Ibid.*
[6] See Credit Suisse, WWF and McKinsey & Company (2014). *Conservation Finance: Moving beyond donor funding toward an investor-driven approach*. January.

Figure 2. Capital Deployment by Investment Stage and Focus Area ($Million)

Investment Stage	Sustainable Food & Fiber	Habitat Conservation	Water Conservation	Total
Angel / Seed Stage	$2 (<1%)			$2 (<1%)
Early Stage	$13 (1%)	$43 (10%)	$2 (1%)	$58 (3%)
Project Finance / Development	$28 (2%)	$49 (11%)	$16 (8%)	$93 (5%)
Growth Stage	$70 (6%)	$1 (<1%)	$11 (5%)	$82 (4%)
Mature Private Companies	$283 (22%)	--	$25 (12%)	$308 (16%)
N/A: Real Asset Purchase	$870 (69%)	$339 (79%)	$147 (73%)	$1,356 (71%)
Total	**$1,266 (100%)**	**$432 (100%)**	**$202 (100%)**	**$1,900 (100%)**

Source: *NatureVest & EKO Asset Management* (2014). Figures 15, 16, 17.

Prospecting capital leverages impact capital

Re-focusing philanthropic capital to be prospecting, or exploratory in nature, opens the opportunity for it to operate in a more experimental manner. It shifts the goal from paying for services to investing in activities that stimulate and support transformational efforts and build the capacity of organizations to expand and grow these activities.

This report calls capital deployed in this manner prospecting capital. It emphasizes that the investment is seeking new opportunities through less traditional paths or opportunities that grow the pipeline of projects that may eventually feed into social impact investment markets. This approach sets out a framework that seeks to expand opportunities for private capital to support positive watershed health outcomes. The activities are market based but the focus is not on creating environmental markets (such as mitigation banking or credit trading). Instead, it seeks to support entrepreneurial endeavors that have minimizing environmental footprints or enhancing watershed health as core values embedded in its process.

> ***Prospecting Capital – the deployment of capital in an exploratory manner through market activity and/or transformation with the aim of scaling up watershed restoration and protection.***

The concept of prospecting capital builds on two beliefs.

- The private sector has two types of capital that can – and should – be leveraged: financial and human. To date, the focus has been on access and scale of financial capital. However, human capital in the form of expertise, mentoring, skills and capacity is equally important. The leveraging each type of capital depends on the project's needs.
- Private capital should be leveraged to create and grow pathways for transformation and innovation in economic activities impacting watershed health rather directly paying for restoration and/or protection activities (eg, best management practices and easements).

Because philanthropic capital can be exploratory and patient, it is uniquely placed to leverage private capital in this framework. Building on these principles, prospecting capital offers a way to leverage the growing availability of private capital offered by social impact investors.

Prospecting capital operates in tandem with social impact capital. (See Figure 3.)
The key difference is the roles prospecting capital and private capital play in an investment framework. Prospecting capital mitigates risk for the private sector and leverages two distinct forms of private capital – financial and human. In this approach, prospecting capital has the potential to attract more early stage investment that eventually leads to more impact projects being ready for mainstream and impact investors.

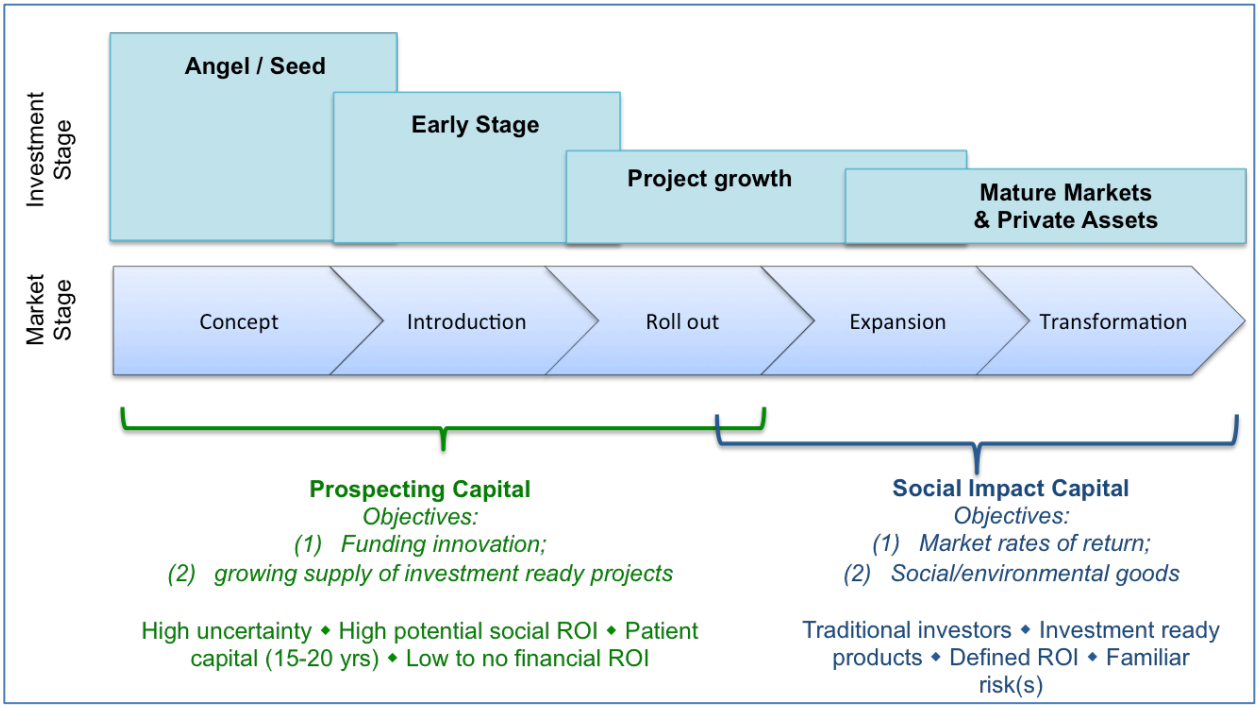
To achieve this goal, prospecting capital operates similarly to venture philanthropy and venture capital.[7] Venture philanthropy mined the experiences and practices of venture capital in guiding a portfolio of organizations through early stages of development.[8] This framework helped to align performance measures, linking the growth potential not just to programmatic goals but also the skills, governance, and overall operational health of a funding recipient. Investing in "human capital" fosters growth that supports efficiencies and expanded capabilities.

Prospecting capital has two objectives: (1) grow the supply of projects that can meet the demands of private capital; and (2) mitigate investor risk in projects that deliver a positive social impact and a financial return.

[7] Venture philanthropy has many labels – enterprise philanthropy, angel philanthropy, catalytic philanthropy, etc For more detail see: OECD netFWD (2014). "Venture Philanthropy in Development: Dynamics, Challenges, and Lessons in the Search for Greater Impact," OECD Development Centre, Paris.
[8] Letts, Christine W., William P. Ryan, and Allen Grossman (1997). "Virtuous Capital: What Foundations Can Learn from Venture Capitalist", *Harvard Business Review*, March-April.

This approach recognizes that the most innovative ideas often come from young entrepreneurs or organizations with little to no experience in implementing the idea. Barriers and risk in this early stage arise from limited human capital in the form of knowledge, skills and capacity. Traditional investment models focus on the financial capital, overlooking this critical human capital deficiency.

Figure 3. Comparison of Prospecting Capital and Impact Capital



3. Identifying Opportunities for Private Partnership

Philanthropic capital can be catalytic if directed to overcome barriers to emerging entrepreneurs, services and products. Common barriers include inadequate infrastructure, uncertain or unproven customer base, attracting and retaining talent, and established supply chains. These market challenges signal high risk and low financial returns to investors. As a result, innovation and/or the scaling-up of green enterprise are hampered, unable to access to capital and/or compensate investors for risk.

Leveraging private capital needs projects to follow a market discipline in where philanthropic capital is deployed, how it leverages private capital, and what outcomes can be reasonably expected. There are a host of methods and projects for achieving water quality protection or restoration, but not all are appropriate for private sector partnership or the engagement of private capital. Partnering with private capital positions positive social impact (change) in the context of market dynamics. This approach fundamentally shifts the focus away from buying environmental goods to "greening" economic activity. In this context, a foundation looks to leverage private capital to make catalytic or transformative investment, much in the same way private-public partnerships have emerged. It builds private sector partnerships that embed environmental impacts in economic activity as the cost of doing business or as an integral part of the product or service's definition. This strategy employs economic levers that potentially have a chain reaction along a business or industry's network.

Leveraging private capital needs project to follow a market discipline in where philanthropic capital is deployed, how it leverages private capital, and what outcomes can be reasonably expected.

A foundation's capital is uniquely placed to overcome these barriers and to partner with private capital. Philanthropic capital has the advantage of being less risk adverse and more prospecting. It can be patient in the time it takes for outcomes and returns to be realized. Importantly, it does not have the same pressures to deliver the same competitive market rates of return that impact capital requires. As a result, philanthropic – or prospecting capital – can mitigate impact investor risk in exchange for higher future potential environmental gains.

Figure 4 sets out a diagnostic framework to evaluate whether a project is a strong candidate to leverage private capital. The framework, which involves six questions, serves as an approach to assessing if a project follows a market discipline in its design and implementation. The first four questions help define the purpose of the project and its needs, while the last two questions

focus on the conditions that funders should seek in a project proposal that aims to leverage private capital.

The assessment questions touch on key project components that should be addressed when seeking project funding. These are:

1. Does the project embed **environmental outcomes** in a business activity?
2. What is the project's **market stage**?
3. What are the project's **barriers**?
4. What is the **role of investment capital**?
5. Does the project have **applicability** to a wider share of the market?
6. Will the project become **self-sustaining** (ie, not dependent upon foundation/grant money)?

This decision framework begins to ensure that the desired environmental outcome(s) is fully integrated in the business model. The link between an environmental outcome and the business model should be clearly and convincingly established. Standards around the type of information or evidence supporting that link need to recognize that the robustness and certainty of the information must match the life stage of the intervention (eg, more mature project should have stronger evidence demonstrating the robustness of the link).

The framework ends with two questions are about the project's applicability and financial sustainability. In many cases, interventions will be in nascent stages. Having a well-designed project is not enough. In order for it to be transformative, catalytic or scale-enabling, the project needs relevance to a broader audience of potential adopters. Applicability assesses its potential for growth within a region or diffusion across sectors. High applicability may justify an investment with high risks.

In addition to applicability, a project should have a path to becoming financially self sustaining. The motivation for leveraging private capital is to make the foundation's investment go further. Besides attracting partnering capital, this leverage should set the stage for philanthropic capital to have an 'exit strategy'. This exit strategy defines when a project is either financially no longer reliant on its initial philanthropic investors or not a good investment. The framework recognizes that the timing and conditions for meeting this condition will vary. The important point is that a project defines a foreseeable pathway to becoming sustainable and fully operational.

Figure 4. Framework for Assessing Opportunities to Leveraging Private Capital

Market stages

The decision framework defines the maturity of a project as a market stage. Each stage tends to face unique barriers and challenges. The early phase involves three stages: concept, market introduction and market roll out. (See Figure 5.) These early stages often face roadblocks in developing organizational capabilities and accessing capital markets. The mature phase involves two stages: market expansion and market transformation. (See Figure 5.) These later stages tend to be "investor-ready," with the hurdle about the costs of capital rather than accessing it.

Concept Stage

The concept stage is an idea in its infancy. It is the precursor stage to attracting investors who see potential returns based on the strength of the business plan or market research. The output of this stage is a robust concept design or roadmap that identifies the necessary organizational capacity and capabilities and a business plan that can underpin efforts in the next stage. These outputs help investors understand: (1) the concept's value proposition by articulating how it fills a need and why that need has not been met; and, (2) the rationale for how it can overcome barriers.

Projects in this stage typically need substantial investment on several fronts. In addition to seed money, they need capacity building, technical skills, and education of stakeholders. This stage faces significant barriers to capital. It does not have revenue streams or assets to secure loans, instead relying on self-funding through 'sweat capital' and/or angel investors. Philanthropic capital is leveraged with private capacity, advocacy and/or equity capital. The capital can take the form of grants focused on taking the concept to next stage.

Market Introduction

This stage is focused on proof of concept – technically and/or financially. It often involves pilots or demonstrations that provide: (1) preliminary evidence to validate the business model; and, (2) help the organization build capabilities and secure talent.

This stage faces a mix of barriers to accessing capital because of incomplete information, significant uncertainty, and little-to-no established revenue stream(s). Individually each of these factors restricts access to traditional sources of capital. In combination, they prevent market development. This stage is highly dependent upon capital to start and/or demonstrate a concept's potential viability to a wide audience (ie, potential customers, suppliers, adopters, etc).

Market Rollout

Market rollout focuses is on customer or user adoption. Projects are poised to become "investor ready." Transaction costs (such as contracting, marketing, accessing networks and switching) are high, acting as market barriers. Two barriers to emerging environmental markets in the Delaware River Watershed include: (1) limited aggregation which prevents opportunities

achieving a scale that is appealing to investors; and, (2) potential crowding by public moneys which deters alternate financial mechanism from being adopted.

Philanthropic investments play an important and strategic role in this stage. They can offset transaction costs and signal "investability" to private capital. Structured appropriately, they can also reduce risk for more traditional sources of capital (first loss, guaranteed payment, interim payments, etc)."

Market Expansion

Projects in this stage have a track record but are still small in scale. Their challenge is growth. Barriers are rooted in the industry's competitive cost structures, market fragmentation, and under-developed infrastructure up- or downstream. Philanthropic capital leverages private capital to overcome these structural barriers and mitigate the time horizon or risk profile for recovering investments. Private capacity also fulfills much needed knowledge and experience in aggregating projects or building "market infrastructure" at this stage (eg, transactional platforms connecting producers to suppliers, facilitating price discovery, etc).

Market Transformation

Market transformation occurs in mature sectors where a company's values and principles shift. These companies tend to be market leaders who define performance standards and use their market power to push value chain transformation. These types of strategies are forward thinking building on awareness, branding and transparency. Projects in this stage rely on corporate reporting (social responsibility, sustainability, environmental) and voluntary agreements. Foundations and corporations partner in development and branding of performance and environmental values.

Figure 5. Early Market Phases

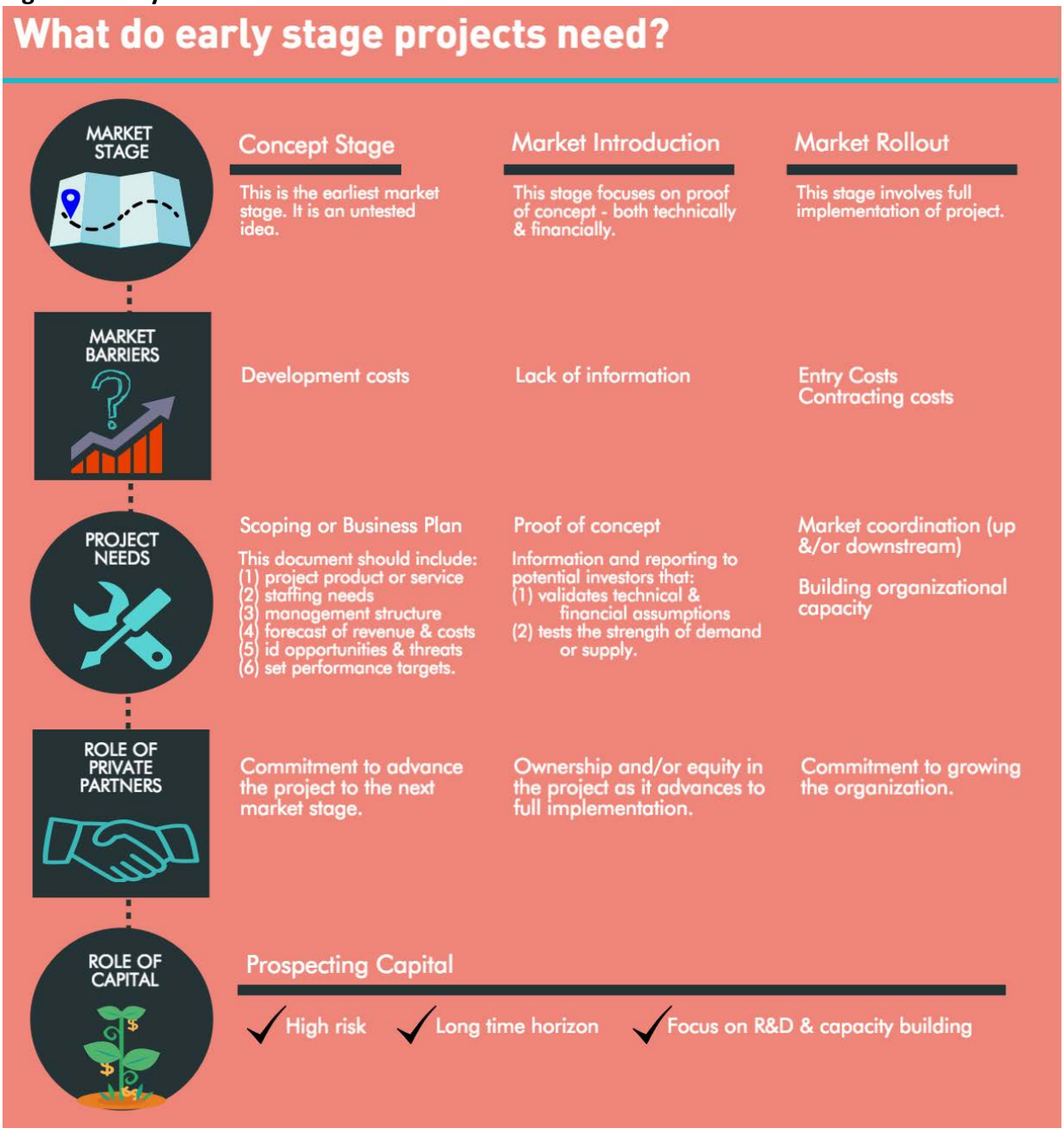
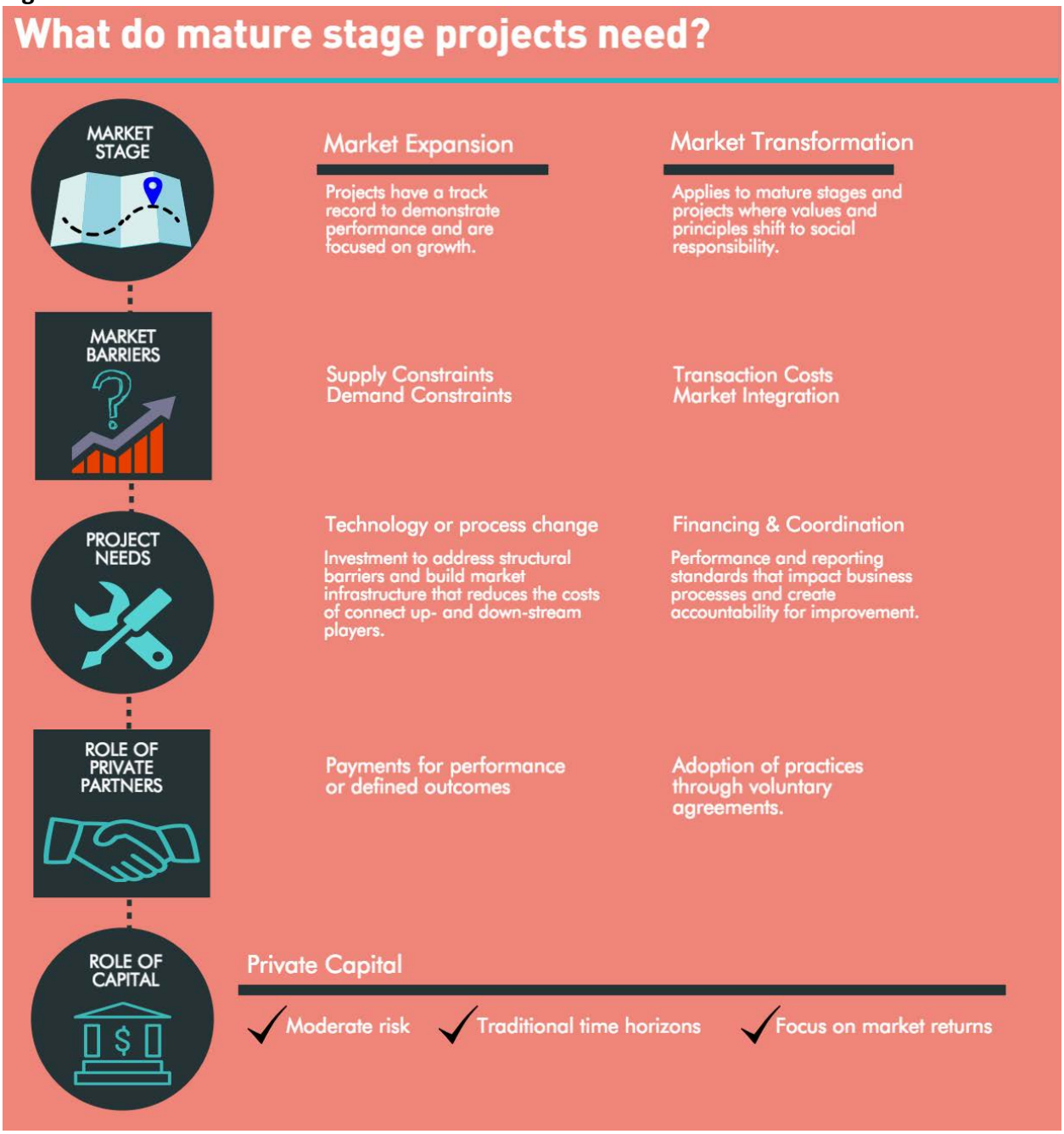


Figure 6. Mature Market Phases



4. Stormwater

Stormwater is one of the leading sources of pollutant loads to waterbodies. It occurs when precipitation falls at rates higher than what the land can absorb. The result is a flow of water across land surfaces that runs off into drains and waterbodies. Poorly managed stormwater flows transport pollutants (such as nutrients, bacteria, grease and litter) and contribute to flooding and erosion problems.

Environmental regulations highlight stormwater management as one way of protecting and restoring water quality. Currently, approaches to stormwater management focus on design and build standards for new buildings and major renovations (industrial, commercial and residential) and sediment and erosion controls during construction. Increased attention is being given to land use planning, protection and enhancement of riparian buffers along waterways, and municipal activities.

Strategy

The EFC, in partnership with TNC-NJ, conducted focused interviews to identify barriers and opportunities to address stormwater through financing mechanisms. The interviews involved representatives from industry, government, interest groups, researchers and investment firm representatives.[9]

The diffuse nature of stormwater points to the essential role of regulation as a significant driver for municipalities and developers to invest in stormwater management. The interviews confirmed the importance of regulation. They consistently cast it as the problem (acting as a direct impediment) and the solution (as a needed demand driver). Using the regulatory environment as the starting point for discussion consistently acted as a barrier to generating creative, market-based solutions. Thinking around leveraging private capital required a fundamental paradigm shift.

Beyond regulatory inadequacies, stakeholder perspectives did not produce consensus over the sources and importance of barriers to engaging and leveraging private capital. For localities, key barriers were education, awareness, political will, and financial feasibility. For environmental groups, a leading barrier was the limited availability of resources to finance restoration and remediation activities. Property managers and businesses

Beyond regulatory challenges, stakeholders did not have consensus around the barriers engaging private capital in stormwater solutions.

[9] See Appendices B and C for details of the interview process and findings.

stressed the poor business case for making investments in stormwater management. For investors, barriers related the shortage of investment-ready projects. In contrast, potential suppliers of stormwater projects pointed to weak demand. The diversity of perspectives with respect to barriers suggests that the solution to engaging private capital is not singular, but rather multi-faceted.

The interviews confirmed that stakeholders see pathways for private capital deployment, if regulatory barriers are addressed. They confirmed that private capital has a role at all stages of a project, from the front end (ie, raising capital to finance a project) through design and build to eventual operation and/or ownership. Leveraging private sector involvement can address barriers to capital (in terms of cost or access). This role follows a financing or investment model, eg, loans, debt guarantee, bonds, etc. On the other end of the spectrum, the private sector can assist in implementation by creating delivery efficiencies, expanded capacity, and enhanced capabilities. This role aligns with several financing models, including private-public partnership and service provider models.

The following describes initiatives that have the potential to leverage foundation investment with private capital. Six initiatives emerged based on the interview and then vetting them with the diagnostic framework presented in Chapter 3. The concepts are organized by market stage. (Market expansion was the only stage where a strategy did not emerge from the interviews and research.) Each initiative involves the private sector as either a partner in implementation or funding. Many of the strategies reinforce each other reflecting a system's approach.

Concept Stage

Strategies in this stage focus on providing information to facilitate project ideas and/or cultivate ideas that can be developed and advanced to the next stage (market introduction). At this point, stakeholders are still climbing the learning curve. Ideas in this stage involve upfront design and incubation costs – even when replicating successful approaches from other watersheds or sectors. For example, institutional arrangements for municipal government can significantly influence project design. In Maryland, local government (or municipality) most commonly refers to county government (with the exception of a handful of city or town, such as the City of Baltimore). Engagement at the county level naturally provides scale in terms of project resources, impact and coverage. In contrast, Pennsylvania has six types of local government: county, township, borough, town, city, and school district. As a result, municipal strategies need to account for the diversity of local governments. They also need to overcome problems of scale in accessing capital to finance stormwater projects and attracting private service providers. Overcoming the scale involves knitting together multiple municipalities, which adds significant transaction costs and complexities.

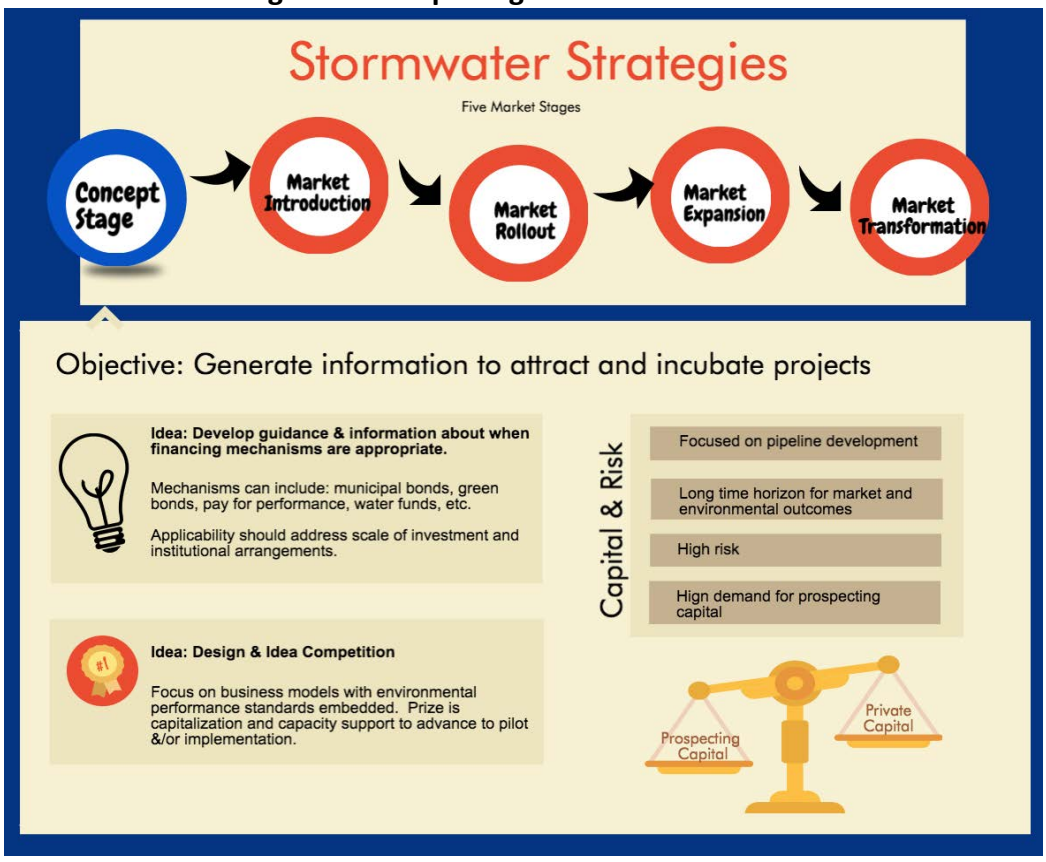
The concept stage is the start of the pipeline for market-driven strategies and projects that can meet investor demand. It is also characterized by discovery and patience, and therefore has a high-risk profile. The potential 'return' on invested capital (be it money or other resources) is low. As a result, philanthropic capital funds research and development costs. Private

partners/capital provides expertise and capacity to advance promising concepts. This partnership of capital and capacity is essential to overcoming these barriers. This stage needs volume in ideas and projects. But the 'economics' and learning curve of this stage will often deter participation and investment.

Two strategies, or avenues for private capital, emerged through stakeholder consultations and research (see Figure 7). Both concepts build on existing mechanisms and approaches. The first strategy addresses information gaps that act as barriers to adopting financial mechanisms, such as social impact bonds and pay-for-success. It would involve identifying the appropriate ways to define demanders – that is, groups of municipalities – that have logical mapping to different financing mechanisms. Guidance about scale, financial viability and outcome requirements for each financing mechanism would be tailored to the municipal category.

This strategy helps develop an inventory of ideas that can generate a potential pipeline of innovative projects. It involves a design competition that provides implementation capital as the prize. The private sector can provide prize capital that is matched by philanthropic dollars or act as a "matchmaker" to connect the competition winner(s) to an adopter and/or investor so that the concept advances to market introduction.

Figure 7. Stormwater Strategies – Concept Stage

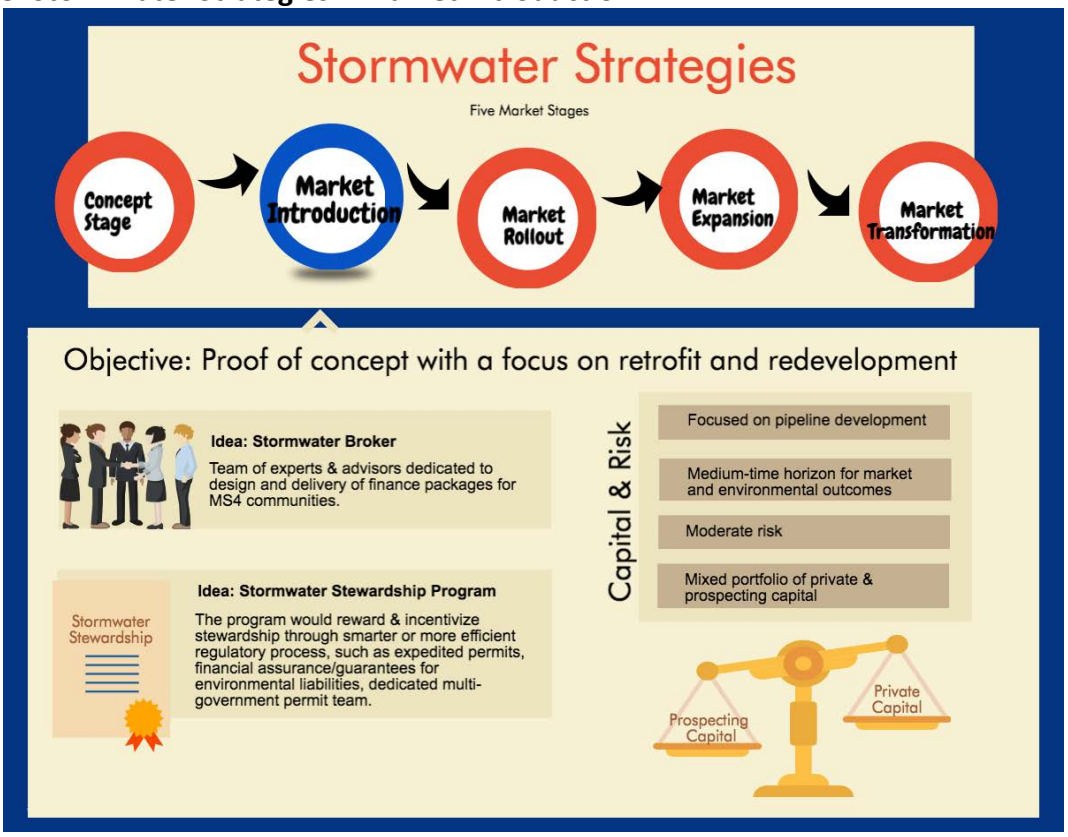


Market Introduction

Two strategies relevant to this stage rose to the top through the interviews and forums: a municipal stormwater broker and a stormwater stewardship program (see Figure 8). The stormwater broker concept builds on the financing guidance suggested in the Concept Stage. A team of brokers and advisors would be funded to implement finance strategies and pay–for-success models at a scale that is appropriate to the Delaware Watershed. This broker team would: (1) inform, educate and directly assist municipalities in formulating options for engaging private capital in a manner that responds to their specific conditions; (2) secure the service providers; and, (3) cultivate investors.

The stewardship program aims to incentivize stormwater investments by providing benefits in the regulatory process. These benefits could be expedited permits, financial assurance or guarantees for environmental liabilities, and/or dedicated multi-agency teams for permit review and administration. As a result, private companies would be able to internalize both intangibles and tangibles to make the business case for adopting stormwater management. A stewardship program lets market participants decide where and how stormwater investments make sense. This approach involves philanthropic capital to educate and resource positions that engage in the regulatory process and capital for guarantees and assurances. Leverage from the private sector would be measured as the increase in stormwater management investments.

Figure 8. Stormwater Strategies – Market Introduction



Market Rollout

Only one strategy emerged for this market stage (see Figure 9). It tackles the technical and financial capacity constraints that municipalities face when addressing stormwater. It proposed funding a stormwater manager – or circuit rider – for municipalities. This integrates stormwater management into a range of municipal activities (eg, zoning, permitting, public works). The conditions and structure for providing stormwater capacity should be tied to a defined period of time and an 'exit strategy' for the philanthropic support. The goal should be foundation-funded positions establishing the value of this programmatic support and cultivating an operating model where the municipality eventually assumes responsibility for funding the stormwater manager position. The strategy does not leverage private capital, but it does apply a performance based model to funding capacity.

Market Transformation

Market transformation involves identifying industry leaders to adopt and elevate the importance of addressing stormwater. This strategy focuses on elevating the importance of stormwater management in corporate reporting (see Figure 9). Currently, environmental and sustainability reporting draws little attention to stormwater, instead emphasizing carbon, waste and water usage. Working to highlight stormwater in corporate and private sector reporting establishes awareness, accountability, baseline performance and commitments to improvement

Figure 9. Stormwater Strategies – Market Rollout and Transformation Stages

5. Agriculture

Agriculture plays two distinct and opposing roles with respect to watershed health. It acts as an important buffer against (sub)urban sprawl and development pressure; yet at the same time, agriculture contributes to water quality impairments through nutrient and bacteria loads. In the Delaware River Basin, agriculture covers roughly one-quarter of the basin's land and attributes to 12% of the nonpoint source pollutant loads. [10]

Strategy

The EFC conducted focused interviews taking a "systems" approach to understanding the barriers to adoption of practices that minimize a farm's environmental impact on water quality.[11] The interviews engaged organizations beyond those that advise, promote and recruit farmers to participate in agriculture BMP programs. The EFC spoke to farm accountants, community bankers, and downstream value chain coordinators.

The interviews had three consistent themes. First, the significance of the farm's bottom line was a key point in all of the dialogues. Interviewees emphasized that BMP adoption is driven by the strength and immediacy of its impact on the farm's profits. For example, many farmers will defer BMP implementation until they can access grants or other funding. As a result, the grant cycle can act as a bottleneck to the adoption rate of BMPs. In other instances, the availability of grants undermines the effectiveness of loan programs.

Incentivizing agricultural restoration needs a strong, direct link to the farm's bottom line.

Second, interviewees suggested that agricultural sector solutions require substantial expertise and human capital, which is seldom measured or funded in BMP programs. Agriculture in the Basin lacks uniformity in terms of scale, practices, commodities and enterprise model makes. Farms tend to be small- to medium-scale (generally less than 150 acres). In addition, they operate under different enterprise models (eg,owner-operated, leased, or Plain Sect), which directly affects the likelihood of adopting BMPs offering long-term returns through improved soils and water quality. The interviews also stressed the importance of consistent, in-person advisory services that build relationships and trust to promote practice changes. These factors

[10] *Investing in Strategies to Accelerate Conservation and Measure Impact in the Delaware River Watershed: A report of the Open Space Institute, the Academy of Natural Sciences of Drexel University and the William Penn Foundation*. April 2014

[11] See Appendices E and F for details of the interview process and findings.

raise the costs and challenges of designing and implementing effective outreach and engagement.

Third, farms are in transition due to a many social and economic pressures. New farmers are emerging as older generations retire, and consumer markets are demanding new products or more sustainably produced commodities. In combination, these factors point to the need for "new" financial and enterprise levers that take advantage of the industry's structural changes. As suggested earlier, farming enterprises make decisions based on measureable and direct impact to their bottom line. Incentives for changing management practices or resource decisions need to have a clear, credible and immediate direct link to a farm's revenue or profitability.

The following describes initiatives that have the potential to leverage foundation investment with private capital. Four initiatives emerged based on the interview and then vetting them with the diagnostic framework presented in Chapter 3. Across the market stages, the strategies respond to the importance of connecting environmental investments to a farm's financial bottom line.

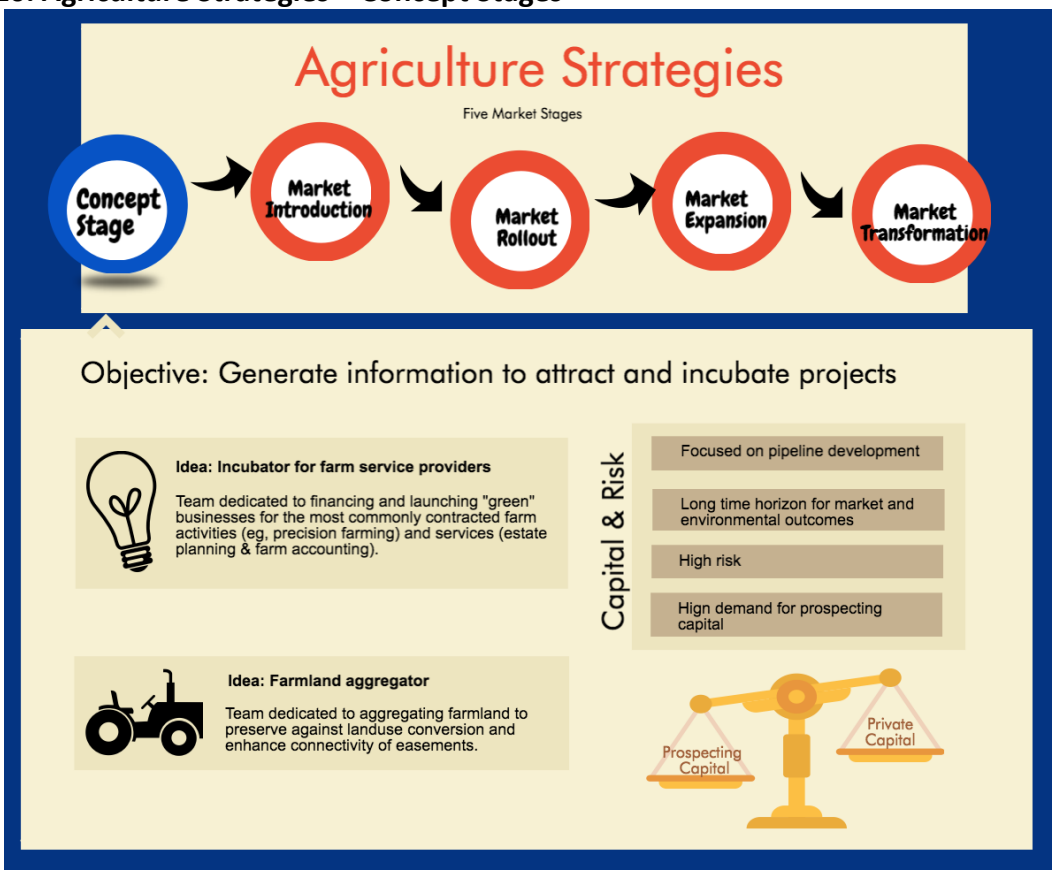
Concept Stage

Interviews with farm service providers – such as community bankers, accountants, suppliers, distribution/wholesalers – stress that a farm's bottom line drives all farm management decisions. 'Greening' farm practices and conservation are cast as add-ons to a farm enterprise rather than fundamental aspects to its operation. Awareness raising and education around the production improvements and other benefits of BMPs needs to target not just farmers but their service providers and consultants who often left out of the loop on this information . For example, farm accountants and community banks are not often brought into discussions around conservation and water quality. Yet, they work with farmers to understand how to finance farm improvements and investments.

Going beyond information packaging, the farming sector needs business models and service providers that specialize in maximizing the double bottom line of a farm's financial and environmental performance. Two strategies for this stage emerged from our interviews. The first strategy is uses an incubator model to cultivate and launch "green" farm service providers. Two services that seemed to gain traction in these conversations included contracted farm activities and estate planning. The contracted farm activities would focus on services heavily dependent on capital equipment or the need to adopt a new technology. This approach relies on the service providers to promote and implement sustainable farming practices. The second service area is farm accounting and financial planning. Farm transition – either from one generation to the next or to new sector entrants – provides a unique opportunity to integrate environmental objectives, such as carbon and other ecosystem credits, easements, buffers, conversion from conventional farming practices and other greening practices.

The second strategy involves establishing a team dedicated to the aggregation of farmland. Existing farmland faces the threat of land use conversion from development pressure and challenges with attracting and retaining of human capital. Developing a financing/investment vehicle for farmland aggregation also addresses issues of scale and fragmentation that act as barriers to connecting farmers with markets for green/locally-sourced and value-added commodities and food products.

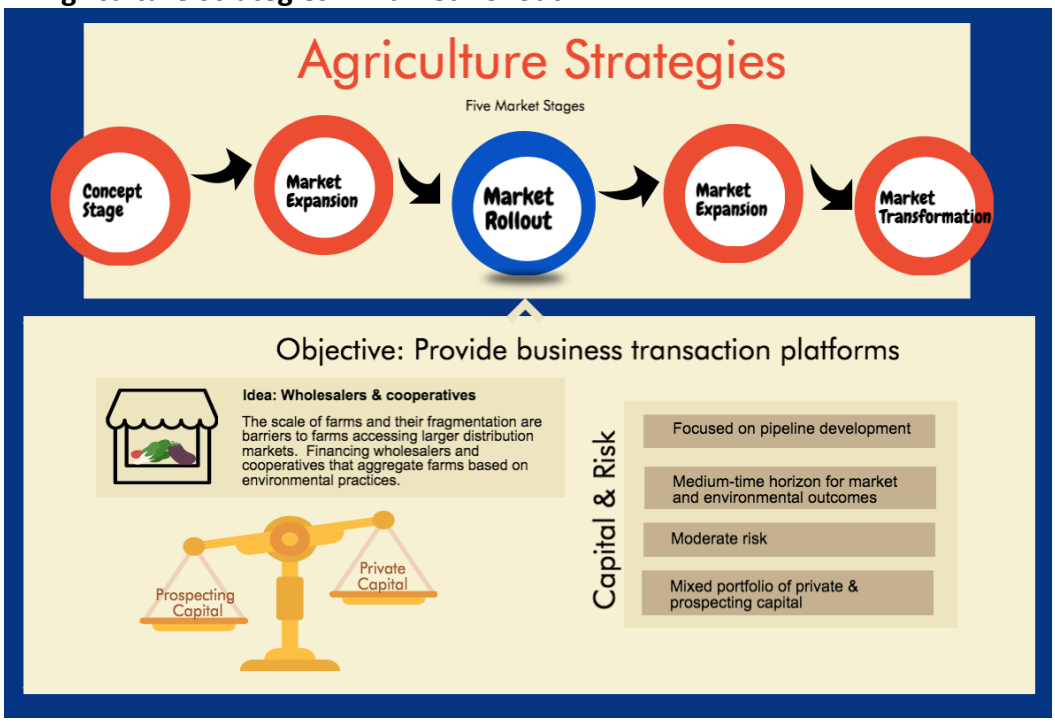
Figure 10. Agriculture Strategies – Concept Stages



Market Rollout

Market rollout is the 'commercialization' of a business plan. It is the stage when businesses begin transacting in a market. These projects are generally viewed "investor ready" and present the greatest potential to attract and leverage impact capital. This stage also faces significant market barriers, including product differentiation, high costs of contracting and marketing, accessing networks and switching costs. A strategy for this stage focuses on investing in the establishment of a "broker" – such as a wholesaler or cooperative – that can overcome fragmentation to build critical mass or networks of farm producers (see Figure 11). In this scenario, prospecting capital could leverage private capital to overcome the transaction costs of value chain coordination and the development costs of shared business transaction platforms that enhance the price signal for "greener" commodities.

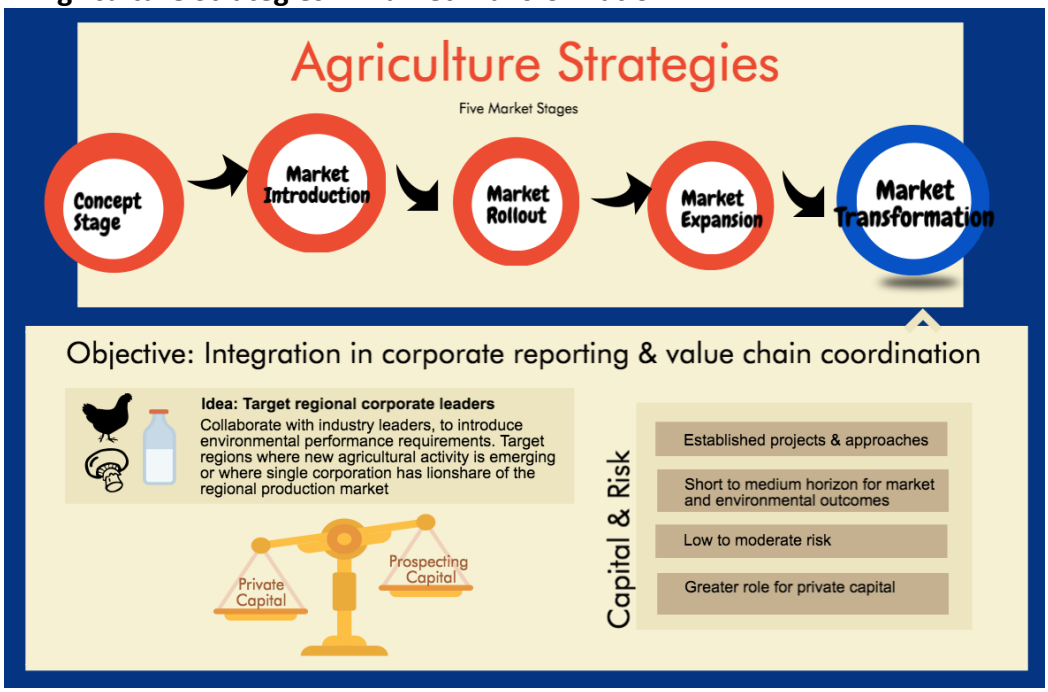
Figure 11. Agriculture Strategies – Market Rollout



Market Transformation

Strategies in this stage aim to incentivize established businesses and corporations to adopt and promote sustainability and environmental principles that emphasize water quality. As industry leaders, they have sufficient market power to signal and introduce standards that flow both up and down the supply chain. Its implementation is opportunistic, seeking to influence emerging agricultural production, such as, for example, the large integrators that are establishing chicken houses the Chester County, or partnering with regional operators, such as Wawa or other dairy cooperatives.

Figure 12. Agriculture Strategies – Market Transformation



Conclusions

A different approach to leveraging private capital.

The philanthropic sector plays a critical role in natural resource restoration and protection efforts. But one sector's investment is not enough to restore a watershed's health. Creatively looking to partner philanthropic capital with private capital offers a solution to making philanthropic investments go further. Our research found that innovative financing is far more rooted in the partnerships than the mechanisms. Existing financial mechanisms are varied and robust enough to stack and pool capital sourced from multiple sectors. As seen in conservation financing – and more recently emerging in stormwater markets – the potential for the public sector to tap into private capital has been gaining traction. Social impact bonds, green bonds, pay-for-success, and other private-public partnerships demonstrate how these collaborations can deliver public services and outcomes cheaper, more efficiently and more effectively.

This report suggests that re-focusing philanthropic capital to be **prospecting**, or exploratory in nature, opens the opportunity for it to operate in a more experimental manner. It shifts the goal from paying for services to investing in activities that stimulate and support transformational efforts and build the capacity of organizations to expand and grow these activities.

The concept of prospecting capital builds on two beliefs. First, the private sector has two types of capital that can – and should – be leveraged: financial and human. To date, the focus has been on access and scale of financial capital; however, human capital in the form of expertise, mentoring, skills and capacity is equally important. The balance in leveraging each type of capital depends on the specific project needs. Second, private capital should be leveraged to create and grow pathways for transformation and innovation in economic activities impacting watershed health rather directly paying for restoration and/or protection activities (eg, best management practices and easements).

Identifying opportunities for leveraging capital.

Leveraging private capital needs projects to follow a market discipline. This discipline should guide where philanthropic capital is deployed, how it leverages private capital, and what outcomes can be reasonably expected. Recognizing the importance of a market discipline, this report provides a framework for assessing whether a project is a strong candidate. It examines: whether environmental outcomes are embedded in the project; its current market stage; barriers to implementation; the role of capital; applicability to other markets; and the project's potential to becomes financial self-sustaining.

Figure 13. Strategies for Stormwater and Agriculture

Market Stage	Stormwater	Agriculture	Role of capital
Concept	• Develop guidance & information when mechanisms are appropriate • Design & idea competition	• Incubator for green farm service providers • Farmland aggregator	High demand for prospecting capital • Focused on developing pipeline of investment projects; • High risk; • Long time horizon
Market Introduction	• Stormwater broker • Stormwater stewardship program		
Market Rollout	• Embed stormwater managers in local government	• Wholesaler or cooperatives	High demand for private capital • Moderate risk; • Medium time horizon
Market Transformation	• Elevate stormwater in corporate reporting	• Partner with regional corporate leaders	

See Chapters 4 and 5 for more detail.

Opportunities for investment

With any strategy that involves transformation, a multi-touch, multi-faceted approach is needed. Barriers to stronger and more widespread stormwater management or agricultural restoration are numerous. Research, corroborated by the interviews, emphasizes that in practice, no single barrier's removal will solve the problem. Instead, entities – be it developers, farmers, landowners, municipal government – need signals and pressure from many directions. Projects and interventions that build the systems and architecture necessary to support transformative change need critical mass, that is, occurring at multiple points along a supply chain or by inundating a market sector.

Table 13 summarizes the strategies that emerged form our work. These ten initiatives all have the potential to leverage foundation investment with private capital. Six initiatives are specific to stormwater; the remaining four apply to agriculture. All of these strategies emerged from an extensive stakeholder interview process and were vetted by the six diagnostic questions above. The concepts are organized by market stage and summarized in the table below. Each initiative involves the private sector as either a partner in implementation or funding. Many of the strategies reinforce each other reflecting a system's approach.

Each strategy has promise, but their success depends on partnerships that bring both financial and human capital to them.

APPENDICES

Appendix A: Innovative Financing Panel Working Group

Jen Adkins, Partnership for the Delaware Estuary
Jim Baird, American Farmland Trust
Clare Billett, William Penn Foundation
Jan Bowers, Chester County Water Resources Authority
Nina Chen, The Nature Conservancy – New Jersey
Patrick Coady, Seale & Associates, Inc.
Carol Collier, Academy of Natural Sciences
Matt Flemming, Maryland Department of Natural Resources
Peter Howell, Open Space Institute
Jerry Kauffman, University of Delaware
Stephanie Pendergrass-Dalke, Pinchot Institute
Will Price, Pinchot Institute
Jane Silfen, Encourage Capital

Appendix B: Stormwater Forum Agenda

UNIVERSITY OF MARYLAND
ENVIRONMENTAL FINANCE CENTER

Preinkert Hall, Bldg. 054
College Park, MD 20742

William Penn Foundation Innovative Financing Strategy
Draft Agenda for the Stormwater Forum
February 2016

Thank you for agreeing to participate in the ***William Penn Foundation Innovative Stormwater Financing Forum*** on February 8, 2016. This memorandum provides important information related to the event, including a description of our goals for the day, the agenda, and forum logistics. Again, thank you for taking the time to participate.

The purpose of this forum is to chart a path for the William Penn Foundation (the Foundation) to improve the efficiency and effectiveness of its investments in Delaware River Watershed restoration and protection efforts. Specifically, our goal for the day is to identify the opportunities and barriers associated with incentivizing private capital and private sector engagement in moving watershed investments—specifically those in the stormwater sector—to scale.

This forum will be small and very focused. As you will see from the agenda below, we will begin the day at 10:00AM and will finish by 2:30PM. The participants come from a variety of disciplines, which represent the key issues necessary for moving innovative ideas forward, including financial, institutional, legal, and political requirements. Specifically, the forum will focus on achieving three outcomes:

1. A collective understanding of the opportunities that innovative financing mechanisms could provide, including potential sources of leveraging capital, both public and private;
2. An outline of the institutional and political structures necessary for incentivizing private investment and engagement in stormwater management; and,
3. A set of very clear and concise next steps for moving ideas forward.

Over the next several months, EFC will draft a set of recommendations to the Foundation, many of which will be based on the outcomes of this meeting as well as follow up conversations with you and other financial and restoration leaders across the region and the country.

Thank you very much or taking the time to help us make this meeting possible. I look forward to seeing you on February 8, 2016. In the interim, if you have any questions or concerns, please do not hesitate to contact me directly at 443-770-4513, or via email at dnees@umd.edu.

UNIVERSITY OF MARYLAND
ENVIRONMENTAL FINANCE CENTER

Preinkert Hall, Bldg. 054
College Park, MD 20742

Workshop location:

School of Architecture, Planning and Preservation (Bldg 145), Room 1111
University of Maryland
College Park, MD 20742

Forum Agenda

10:00 AM: Welcome and introductions

10:15 AM: Laying out the issues

- Brief description of the William Penn Financing Project
- A description of the financing challenge
- The need for private intervention and engagement

10:45 AM: Potential innovative financing options and opportunities

- Options and examples from other fields
- Initial institutional structures
- Potential for moving to scale in the Delaware River Basin

11:45 AM: Open discussion

- Appropriateness to address environmental problem
- Potential institutional structures
- Technical features needed
- Balancing risk and performance in nascent market
- Investor interest
- Availability of private capital

12:30 PM: Lunch

1:00 PM: Next steps for moving forward

- Necessary political and regulatory requirements
- Potential partnership opportunities
- Realistic timelines and impacts

2:30 PM: Adjourn

UNIVERSITY OF MARYLAND
ENVIRONMENTAL FINANCE CENTER

Preinkert Hall, Bldg. 054
College Park, MD 20742

Invited Forum Participants:

Mark Bryer, The Nature Conservancy
Erik Michelson, Anne Arundel County, MD
Eric Letsinger, Quantified Ventures
Jose Gaztambide, Quantified Ventures
Ashley Allen, i2 Capital
Doug Lashley, GreenVest
George Kelly, Resource Environmental Solutions
Brian VanWye, District Department of Energy & Environment
Brad Rogers, Moreland Advisors, Inc.
Joe Gill, Prince George's County, MD
Adam Ortiz, Prince George's County, MD
Nick Dilks, Ecosystem Investment Partners
Matt Fleming, MD Department of Natural Resources
Lee Currey, MD Department of Environment
Katherine Antos, EPA Chesapeake Bay Program Office
Richie Jones, TNC-DE

Directions:

Visitor Parking Map: http://www.transportation.umd.edu/parking/maps/map_visitor.pdf

Parking: Mowatt Lane Garage - Three hundred fifty parking spaces within this facility are allocated for visitor parking on the top level of the garage. The hours of operation, as a digital pay station facility, are 7:00 a.m. to 2:00 a.m. daily. Parking rates for this facility are $3.00 per hour, with a $15.00 per day maximum and a $5 per day maximum on Saturday and Sunday. Make note of your parking space number as you will need it for the pay station.

Walking Directions from Mowatt Parking Garage to School of Architecture, Planning and Preservation: Use the WEST ELEVATOR to exit the parking garage. Immediately upon exiting the elevator, make 2 rights to exit the garage. Walk up the steps and head toward the large M embedded in the bricks on the pathway keeping the Robert H. Smith Business School (Van Munching Hall) to your left and Prince Frederick Hall to your right. Make a left at the set of stairs just past the yellow fire hydrant. The school will be directly in front of you. Follow the brick path to the school. Enter at the glass doors labeled School of Architecture, Planning and Preservation, Bldg 145. Take the elevator to the second floor. Take a left as you exit the elevator and then take your first left. Room 1111 will be at the end of the walkway.

Appendix C: Stormwater Forum Notes

William Penn Innovative Financing
Stormwater Forum – February 8, 2016 – University of Maryland

Meeting Notes

Private sector has two distinct roles in addressing stormwater: accessing capital /reducing capital costs or assisting in implementation /creating efficiencies to bring down costs. Its involvement can be at the front end (ie, raising capital to finance a project) through design and build through operation and/or ownership.

Two challenges to engaging private capital are defining the "mechanics" of a solution that addresses the tension in multiple (competing) interests (e.g., among regulators, non profits, for profits) and demonstrating the potential for profit to be had. The sources of competition and interested parties need to be acknowledged upfront and addressed when developing a project.

Private sector involvement is gaining momentum – especially given trends in the wetland and stream restoration markets. There is potential to also think about how these approaches translate to species protection applications.

Potential solutions need to be crafted to the unique conditions of the watershed. These conditions are not just physical but also regulatory, political and institutional. Key differences between Chesapeake Bay and Delaware River watersheds are:

- Scale: in MD, stormwater tends to be managed at the county level; in PA, it is at a smaller scale (eg, township)
- Institutional: MD has dedicated state and jurisdictional funding streams channeling monies to address stormwater; and
- Regulatory: the Chesapeake Bay TMDL sits on top of the local water impairments providing a natural 'regionalization' and contains 10 MS4 jurisdictions, as well as the State Highways Authority.

The Chesapeake Bay watershed offers several examples of market and private sector strategies to address (municipal) stormwater obligations. They are: District of Columbia's stormwater trading scheme, Anne Arundel County's pay for performance pilot scheme, and Prince George's County's private-public partnership with Corvias.

In both watersheds, municipalities face the following barriers for municipalities to address stormwater: (1) contract structure, (2) implementation capacity, and (3) bond rating. The relative importance of these barriers varies – especially given scale (e.g., county versus township).

A key advantage of engaging private sectors is the transfer of risk away from the public sector. The private sector is arguable better placed and has better capacity to handle risk with respect to investments that meet desired (performance) standards. Two models of where governments have

engaged the private sector successfully in transferring risk are mitigation banking and social impact bonds. For example with mitigation banking, the risk is completely held by the private sector. The private sector has to implement the projects and can sell credits only after the work has been completed and "proven". The risk is two types: first, the project is achievable and effective; and second, demand will materialize for the credit that is produced (ie, return on investment).

Where can philanthropic capital plug gaps or assist in the transfer of risk to those best able to address it (i.e., private sector)?

1. Need to develop standards and performance through education and demonstration projects/pilots.
    a. Let the pilots be proof-of-concept – demonstrating not just technical feasibility but also financial feasibility (i.e., cost savings and/or profitability).
    b. Education on project performance standards and requirements for both the citizen and regulatory audience.
2. Articulating the 'story' from the science to the objective(s) to the solutions.
3. Cultivate stormwater managers:
    a. Establish an endowment that funds stormwater managers.
    b. Develop cohort of local government stormwater mangers that can be embedded in local jurisdictions to support cross fertilization and taking advantage of economies of scale.
    c. Examples come from Lycoming County, York County, and emerging efforts in Blair County.
4. Articulate objectives and performance standards and then put the out to tender (RFP)
    a. Find the coalescence between the technical, regulatory and marketplace realms.
    b. Find scale potential based on TMDL alignment and potential replication with business case.
    c. Develop business case that leverages "add-on's" (eg, ancillary benefits of green infrastructure, open space, conservation efforts).
    d. Ensure investment has serious strings attached.
5. Invest in building regulatory / market structure to attract more investors.
6. Endowment to fund engagement strategy and laboratory concept with matching funds for early adopters.
7. Need to foster/support leadership that "lives and breathes" stormwater initiatives and can "open doors."
8. Need to increase the number of successful demonstration projects and build on systems that include tracking, accounting and reporting system – not just physical performance of but also the performance of organizations doing this work.

Attendees

- Ashley Allen, i2 Capital
- Katherine Antos, EPA Chesapeake Bay Program Office
- Pat Coady, Seale and Associates
- Nina Chen, Nature Conservancy
- Lee Currey, MD Department of Environment
- Stephanie Dalke, Pinchot Institute
- Nick Dilks, Ecosystem Investment Partners
- Alex Eidson, Encourage Capital
- Matt Fleming, MD DNR
- Richie Jones, Nature Conservancy - Delaware
- George Kelly, Resource Environmental Solutions
- Doug Lashley, GreenVest
- Eric Letsinger, Quantified Ventures
- Erik Michelson, Anne Arundel County, MD
- Adam Ortiz, Prince George's County, MD
- Brad Rogers, Moreland Advisors, Inc.
- Brian VanWye, District Department of Energy & Environment
- Dan Nees, Environmental Finance Center
- Jen Cotting, Environmental Finance Center
- Naomi Young, Environmental Finance Center
- Albert Guiney Engel, Environmental Finance Center

Appendix D: Agriculture Interviews

William Penn – Innovative Financing Panel
Interview Notes for Agriculture Forum Development

Throughout the fall 2015, EFC interviewed experts in the agriculture sector. These experts answered questions about the barriers to 'greening' agricultural practices and where they saw opportunities for philanthropic dollars to be leveraged with private capital to incentivize and scale up efforts that ultimately enhanced and/or protected the health of the Delaware River Basin. The following summarizes the interview findings.

Key Findings

- The Delaware River Basin has no single environmental issue, such as water scarcity or a hallmark pollutant (unlike the Chesapeake Bay with nutrients and sediment constituents). The absence of a leading environmental threat makes developing financial incentives that can achieve substantial scale and impact challenging.
- The farms in the Basin can be characterized as small to medium in scale, highly fragmented and diverse in terms of production systems, commodities and ability to access existing distribution networks. At the same time, they are well-placed, being located in close proximity to dense urban markets. Currently, locally produced foods flow into the regional (urban) markets but not necessarily in an efficient manner creating an opportunity for downstream markets to better convey demand for a reliable supply of sustainably produced food.
- Farm enterprise models in the basin tend to fall into one of three classifications: owner-operated, leased (for short terms), and Plain Sect farms. These farms are of small to mi-size (less than 150 acres). The short-term lease model acts as a significant barrier to adoption of BMPs that offer longer-term returns (in soil health or water quality). The unreliability of short-term leasers to implement BMPs is also challenging for loans since there is no hard infrastructure (land, barns) to use as collateral for the loans for BMPs. Only the farmer-owned operations are likely to implement sound land use practices that restore and protect water quality.
- The average farmer in the Delaware River Basin follows the national trend of aging farmers, (most over the age of 58). The increasing age highlights the need and potential opportunity of transitional farm planning for the next generation of farmers in adopting greener and more environmentally-oriented practices (e.g., GMO free, organic, etc.) and/or farmland preservation.
- Other factors to consider, that arose in the interviews, include:
  - Ecosystem services as markets for buffers, easements, Carbon, and nutrients may be potential mechanisms to jump start conservation-oriented practices being implemented.
  - The intersection between agriculture and MS4-permitted communities may be an opportunity to consider implementing more water quality improvements. Through the lens of the bubble theory, there may be greater interest in incentivizing sound land use practices on the agricultural lands in and adjacent to MS4 communities.

Preliminary Recommendations for Paths Forward

Three aggregation points emerged from the interviews where philanthropic/private investment could incentivize practices that improve the Basin's health:

- Aggregation of Land (regional strategy)
- Aggregation of Food (beyond the farm gate)
- Aggregation of BMPs (on farm practice)

The interviews drew attention to the need for interventions that focus on aggregation so that investments can reach scale by overcoming the challenges of a fragmented industry. Below are four ideas that emerged and build on using market-like incentives achieve stronger environmental performance.

- IDEA #1: Develop a model of pay for performance for farm service providers (Conservation Districts, extension services and farm contractors) that is focused on farm/regional adoption of practices that deliver water quality improvements (through BMPs are in place and functioning fully). This concept focuses on promoting technology and state of the art practices that would typically be contracted farms.
- IDEA #2: Bridge financing to facilitate the conversion from conventional to organic farming.
- IDEA #3: Investment in service providers that supports value chain coordination and other shared business transaction platforms and/or services that enhance the price signal for "greener" commodities.
- IDEA #4: Investment in service providers that assist in estate/succession planning that integrates environmental objectives, such as ecosystem/carbon credits, easements, buffers, conversion from conventional farming practices and other greening practices.

Next Steps

Through the Ag forum, participants will vet the ideas and develop concept plans for the ones that are most promising. The concept plans will articulate target participants, scale of effort and candidate measure of success.

Interview Summaries

I. FARM SERVICE PROVIDERS

EFC conducted telephone interviews with experts from:

- Chester County Conservation District
- Red Barn
- Sustainable Chesapeake
- State Conservation Commission
- AgChoice Farm Credit
- PA Farm Bureau.

Chester County Conservation District – *Dan Miloser and Chris Strohmaier, 11/10/15*

- Farm performance is diverse throughout the Chester County area, where approximately 15% are poorly run, 15% are well run, and the remaining 70% in between are mixed. This mix in performance presents challenges for farmers and service providers.
- Farm enterprise models are diverse, including a small population of Plain Sect.
- Most farmers own the land they work in Chester County with the exception of Plain Sect who tend to lease from family members.
- In the area, financing hurdles tend to be "big ticket" items for dairy and mushroom farms.

- Small farms tend to need excavation and terracing fields.
- The Conservation District finds it harder to service the Plain Sect population as they are uninterested in government support and do not have the cash flow to implement best practices. While they will not not accept government money, foundation money might be acceptable.
- Farming practices are necessarily different between Plain Sect and the general agricultural community requiring strategies that are tailored to each. For example, the lack of mechanization in Plain Sect, farming practices acts as a barrier to planting cover crops in winter or altering manure storage and application rates.
- Targeting increased organic and sustainable farming needs to be staged and is easier for beef and poultry; typically much harder for dairy.
- Needs more assistance with maintenance and inspection for CREP practices, which run about $15/acre for maintenance.
- Potential win-wins (better for the environment and farm bottom line) for targeted investment include focusing on the following: energy use; animal health; nutrient management; soil erosion; and stormwater issues. Stormwater on farms presents its own challenge where most farmers want to separate clean from dirty water but need help to do it.

<u>Takeaways</u>

- Technical assistance on best practices operation and maintenance (O&M) is the key challenge. More staff would mean more follow up to make sure practices stay on track and function with higher compliance through conservation plans and other planning tools.
    - The Conservation District has 1,700 farms in Chester County, and they need staff to get farms up to baseline compliance; and even then, it does not have sufficient time and staff to return to the farms with any regularity or frequency to ensure practices are running operating well.
- Need to tailor objectives to account for cultural differences influencing farm practice (e.g., willingness to accept federal/nongovernment monies, mechanization of farming, etc.).
- Potential to help with stormwater issues is a targeted opportunity to help localities meet compliance and help farms reduce runoff. This area is largely untapped given limited discourse between the farmer and the governing jurisdiction.
- Riparian buffers are an example where assistance should be better targeted; farmers are good with fences but not with establishing and maintaining riparian buffers (e.g., CREP pays $15/acre for maintenance which is not enough to maintain the buffers so many are constructed but not maintained).
- Work with integrators and co-ops (e.g., Highpoint, Turkey Hill, WaWa, mushroom co-op) to incentivize practices such bonus payments for meeting environmental stipulations.

Red Barn *– Peter Hughes, 11/13/15*

- Urban/suburban intersect with agriculture holds promise for incentivizing ‘green’ practices, because of proximity to consumers.
    - Eg, MS4 communities surrounded by agriculture.
- Bring forward BMPs adoption in advance of regulation:
    - 6-month scaled manure storage
    - no winter application of fertilizer
    - linking BMPs and riparian buffers when ranking for state/federal grants.

- Price signal needs to impact a farm's bottom line.
- Dairy is hard to transition to organic/grassfed because need economy of scale and increased land requirements.
- Incentive mechanisms that may work, such as lower loan rates based on meeting environmental stipulations
- Consider incentive mechanisms that anticipate future regulations.

Sustainable Chesapeake – *Kristen Even Hughes, 9/24/15*

- Targeting service providers – i.e., outsourced services such as fertilizer application / manure injection, precision farming. One model is to help these service providers access low cost loans based on the share of customers using environmentally friendly/ cutting edge practices.
- Demographics of farmers is changing. Incentives need to respond to this trend.

PA State Conservation Commission – *Joel Semke, 9/24/15*

- Need more outreach to get more sponsors involved.
- Eligible to receive incentive predicated on being liable to pay PA income tax. Nonprofits and credit unions are ineligible, which poses issues.
- Need for outreach, so farmers know how to use of credits.
- Participation rate is good but payout falls short. In general, PSCC receives more applications than they can award the annual allocation of $1M (about 300 + applications receive the $1 mill).
- How to make smarter tax incentives – get the banks to take a stronger role.

<u>Takeaways</u>

- In purchasing of credits – 95% of sales of tax credits go to banks; therefore, PSCC sees the need to work more closely with banks (like Fulton.)
- Involve corporations to take credits, i.e., seed companies.

AgChoice Farm Credit – *Mike Hosterman, 11/20/15*

- Ag choice has a consulting role to help with transition planning and work with family dynamics. Often family conditions of farms are tough to pass on if highly leveraged / significant debt.
- Challenging to find money to leverage for manure pits or other stewardship practice when farmers need money for the legal fees for estate planning and/or are trying to get out of debt.
- The small to medium sized farms in the basin are fragmented but can act as a buffer against urbanization. He suggests promoting mixed land use profiles in ordinances and zoning to preserve farmland against economic pressures.
- Consider using carbon credits to underwrite the transition plans. Look at development rights or implementing BMPs to get supplemental income to defray the costs. For example, a transitional plan that typical costs $20k could be underwritten to cost $4k. Underwriting carbon payments and development rights could be a pathway to help with transition planning.
- In his experience, many in his territory (Lancaster County) unsuccessfully applied for conserve easements, because the county does not have enough funds to implement all easement requests; he sees only preservation through easements on 2-3 farms /county /year.

- Accessing capital is barrier to infusing more environmentally-friendly practices during a farm's transition.

Takeaways
- Need to go beyond adding BMPs to also preserving farmland.
- The transition period of farms (from one owner to the next) presents an opportunity to integrate ecosystem service payments such as Carbon credit

PA Farm Bureau – *Wayne Brubaker, 12/2/15*
- Transition plan costs average between $10,000 and $20,000. A key challenge for farming families is keeping it up-to-date. Costs of developing a transition plan are not generally farm size dependent.
- Transition is always costly. Younger farmers that buy out older farmers often have cash flow problems, because the 'buy out' is not increasing production (eg, in comparison to buying additional land).

Takeaways
- Would target transition assistance to most productive lands if the aim is to preserve agricultural land (where soils are best and weather is conducive to agriculture).
- Incentives can help where they target fixed costs – especially with riparian buffers and conservation. For example when taking land out of production, fixed costs get spread over a smaller land base. Ideally, fixed costs should account for 25-30% of total costs.

II. FINANCING ENTITIES

EFC conducted telephone interviews with experts from:
- Ephrata Bank
- Fulton Bank
- PennVEST
- Cultivian Sandbox Ventures

Ephrata Bank – *Sean McKinney & Mike Gerhardt, 11/12/15*
- Generally environmental and reclamation activities are not perceived as "revenue positive" activities for a farm.
    - No till and cover crops are notable exceptions with positive bottom line impact.
    - Terraces, waterway buffers (eg, contours, stream bank fencing) have negative impact, because reduces the land base for production. These activities are typically 75-100% grant-funded.
- Banks can partner more easily with government, than other private sector or nonprofit organizations, because bank regulators find government more acceptable.
    - Banks are willing to advocate and promote greater awareness of programs and opportunities but not implement when it comes to non-government partners.
- A key challenges in the farming community is addressing the aging farmer population. The average farmer age is increasing (58.3 years, 2012 Ag Census).

- Farm lease model influences a farmer ability to access capital for environmental improvements.
    - Leasing farmers need collateral (since they can't use real estate) to finance (long term) capital improvements (considered attached or fixed to the property such as manure storage, terracing).
    - In contrast, shorter-term capital improvements tend to not require collateral – such as buying no till drill equipment to support precision agriculture. These loans will be typically 5 years or less.
- Structuring the incentive
    - consider tax life on capital equipment (generally 15 years),
    - guarantees for loss or default (FSA tends to cover 90% of loss),
    - Plain Sect will take direct FSA loans and guarantees but not "handouts",
    - Look into MILC program – guarantees revenue by providing floor to commodity price, and
    - consider whether grant money is taxable income.

Takeaways

- Economic incentives needs to address cash flow or provide collateral.

Fulton Bank *– Ted Bowers, 11/13/15*

- Loans to farms:
    - Under lease enterprise model, challenge is finding collateral. Banks can't put a lien on a fixture or the property. Banks typically look for 'landlord waiver' or shorten the term of the loan (5-7 years). A guarantee – from government, a foundation or entity like Pennvest – can help.
    - Banks typically require 20% down which plays off the appraisal. However, the "down" could come from any entity.
    - Banks like to see a loan to value ratio of 80% plus good cash flow.
    - Loans don't have points but rather a fee.
- The impact of easements on land values.
    - Depends on relationship between alternative land use values.
    - In Lancaster Co., agricultural land has high property value (i.e., developed land and agricultural land values are about on par). For property values: development easements have little impact; in contrast, buffers remove land from production, lowering the market value of property.
- Philanthropic dollars could be used to buy down on loans rather than give as grant.
- Commodity prices play big role in when there is opportunity to change practices or shift from conventional to organic grains.

PennVEST *– Brion Johnson, 10/8*

- Need to find the intersect between agriculture and suburban development (MS4 efforts). Agriculture tends to only work on stormwater issues where there's an MS4 targeting N&P.
- Need enforcement to make WQ/SW "market" take off for agriculture.
- PennVEST has limited grant money. Instead offers low interest loans (1 ½ to 2 1/8% over 20 years).
- Criteria for assessing candidates for loans: cash flow and ability to handle debt.
- Find small farms seeking loans for manure management BMPs, SW holding tanks.

- Often need some grant to help with cash flow capacity.
- Challenge is finding WQ opportunities that impact the farm's bottom line.
- Incentives need to influence the farmer's perspective on or willingness to handle debt with investment that have water quality impacts rather than improving the bottom line as the leading factor. As any "for profit" – they look at the bottomline. If they can improve water quality and bottomline, a farmer will do it; a farmer will not do it if the water quality improvements come at the expense of bottom line.
- Penn Vest looks at cash flow and capacity to handle debt. The majority of applicants is the farmer who can't fix the tractor. Farmers will get the low interest loan for that but hold off until they get grant money to fix manure running down the stream.
- Cash flow is important. In-kind contribution doesn't work for meeting loan requirements.
- Farmer's ability to access continuous rounds of grant monies means that farmers defer on environmental/capital improvements until they can access grants (rather than taking out loans to pay for the work). No cost to waiting, since enforcement is not a concern to them.
- Cost of or access to capital are not the issue – instead it is about the farm enterprise's ability to handle the debt.

Takeaways:
- Grants crowd out private market incentives/strategies.
- Incentives alone are not enough – need enforcement.
- Incentives need to affect a farm's capacity to handle loans (cash flow to debt ratio).
- Intersect between Ag and MS4 seems ripe for intervention on addressing SW/WQ.
- Possible strategy: tax incentives for reinvestment in the farm.

Cultivian Sandbox Ventures – *Andy Ziolkowski, 11/18/2015*
- Trends in scarcity of water are a key driver for food and agriculture technology based ventures around the US.
- Other opportunities include providing row crops for biodiesel.
- Approach to vetting opportunities: evaluate market adoption potential (i.e., purchase and use of new product).
- Opportunities for economic incentives are where they change the adoption curve or "take price out of the equation".
- Reducing barriers to market participation typically needs economic incentives and subsidies.
- Look at the Gates Foundation's approach to a venture fund providing financial incentives that look beyond equity capital to encourage early technology adoption.
- Agronomist consultants are key conduit for getting technology to market.

III. VALUE CHAIN – BEYOND THE FARM GATE

EFC conducted telephone interviews with experts from:
- Fair Food Philly
- USDA

Fair Food Philly *– Ann Karlen & Sara Miller, 11/11/15*

- Value chain coordination and facilitation involves soft infrastructure aimed at improving the farmer's bottom line through an increase in production or product profitability. This type of infrastructure needs to be strengthened in the Basin.
- Fair Food Philly has been focusing on value points beyond the farm gate – eg, mill – where are capacity constraints and information problems rather than challenges in accessing capital. For example, the challenge to expanding sustainable/healthy grains market (and similar products) is lack of good information about market growth, future prices, consumer demand projects.
- Two barriers to market expansion: (i) marketing distribution infrastructure; and (ii) strength of market demand to support either scaling up of farm production or increased farm participation in the market. Opportunities in the economy of scale in farms sharing resources in the marketing/distribution infrastructure.
- Downstream in value chain can signal where there is greater economic rewards and for setting performance standards when converting from conventional farming practices.
- Lancaster Farm Fresh Cooperative is an example of successful cooperative that works with small-scale farms – 120 small farms (40 acres or less) that are organic or in transition. It is the largest all local food hub/distributor in Philadelphia.

<u>Takeaway:</u>

- Aggregators and distributors provide central point for sending demand/price signal to farms especially in context of a producer market characterized by small to medium sized farms that are highly diverse.

USDA *– Jim Barham (NRCS), Joe Heller (NRCS, NY), Betsy Rakola (Agricultural Marketing Services), Elanor Starmer (U.S. Department of Agriculture), 11/11/15*

- Challenge in food systems is not lack of credit but rather need for technical assistance – not just in the initial start-up phase, but also as the farm business grows and restructure in a cost-effective way.
- Land transition issues are gaining attention – not just in terms of intergenerational transfers but also transition from conventional to organics farming.
- Demand for organic grains is an issue – companies are looking to increase the acreage of organics especially for feed.
- USDA/NRCS offers help with conservation, but 'hand holding' services are needed to help farmers access the value chain.
- Hudson Valley has examples of cooperatives and business models that work with an agriculture sector that is diverse, fragmented and small to medium scale.
- Price premium is strongest for organic and locally-sourced meet and poultry.
- Anecdotally, once connected to an organic food chain, farms will scale up production.

Takeaway:

- Farms in transitions need service providers that they trust (eg, value chain coordinators, food hubs that can share prices).
- Farms need trusted third party who can act as an 'honest broker' among the food hub with spin off businesses providing shared resources such as inventory exchange or other business transaction services.

Interviews

Name	Organization	Key Issue
Farm Service Providers		
Dan Miloser Chris Strohmaier	Chester County Conservation District	Farm structure and challenge
Peter Hughes	Red Barn	Agriculture services
Kristen Evans Hughes	Sustainable Chesapeake	Agriculture services
Joel Semke	PA State Conservation Commission	REAP / Tax Credits
Mike Hosterman	AgChoice Farm Credit	Estate Planning
Wayne Brubaker	PA Farm Bureau	Estate Planning
Financing Entities		
Sean McKinney Mike Gerhardt	Ephrata Bank	Accessing capital & Costs of capital
Ted Bowers	Fulton Bank	Accessing capital & Costs of capital
Brion Johnson	Pennvest	Economic incentives
Andy Ziolkowski	Cultivian Sandbox Ventures	R&D investment
Value Chain		
Ann Karlen Sara Miller	Fair Food Philly	Value chain coordination
Jim Barham Joe Heller Betsy Rakola Elanor Starmer	USDA	Value chain coordination
Other Technical Experts		
Marjorie Kaplan	Rutgers Climate Change Institute	Climate change resiliency
Karen Martynick Stephanie Armpriester	Lancaster Farmland Trust	Farm practices
David Just	Food Security Coordinator, Cornell University	Food security
John Rhoderick	Maryland Department of Agriculture	R&D and farm practices

Other interviewees include:
Tim Garrahan (DE NRCS), Blaine Delaney (VA NRCS), Eric Benfeldt (VA Extension), Rory McGuire (VA Extension), Jenn Volk (DE Extension), Connie Musgrove (private consultant), Jimmy Daukis (AFT), Bill Satterfield (Delmarva Poultry Industry), Bill Angstadt (DE/MD Agribusiness Association).

Appendix E: Agriculture Forum Agenda

INNOVATIVE FINANCING – AGRICULTURE
William Penn Foundation

In November 2014, the Environmental Finance Center (EFC) launched the Innovative Financing Panel project, with the goal of addressing one of the William Penn Foundation's key program areas and priorities: the restoration and protection of the Delaware River and its watershed lands. A critical output of this project is a financing strategy that identifies pathways for the Foundation to leverage its watershed funding through private partnerships that are catalytic in nature and can expand the effectiveness of initiatives protecting water resources across the region.

Throughout the fall 2015, EFC interviewed experts in the agriculture sector. These experts answered questions about the barriers to 'greening' agricultural practices in the Delaware River Basin and where they saw opportunities for philanthropic dollars to be leveraged through market forces. This forum builds on the finding of the interviews.

FORUM OBJECTIVES: Participants will vet four ideas that emerged from our research and develop concept plans for the one or two ideas that seem most promising. The concept plans will articulate target audience, scale of effort and candidate measures of success.

AGENDA

10:00 Introductions

10:15 Initial discussion of criteria for vetting ideas

10:45 Idea vetting

12:15 Break

12:30 Working Lunch
- Revisit criteria for idea vetting
- Identify idea(s) to carry forward

1:00 Concept plan(s) development

2:15 Review and next steps

2:30 Adjourn

Background for the Forum

The following are characteristics of agriculture in the Delaware River Basin that are material to identifying and designing innovative financing mechanisms for this sector.

- *The Delaware River Basin has no single environmental issue, such as water scarcity or a hallmark pollutant* (unlike the Chesapeake Bay with nutrients and sediment constituents). The absence of a leading environmental threat makes developing financial incentives that can achieve substantial scale and impact challenging.
- *Basin farms are often small to medium in scale, highly fragmented and diverse in terms of production systems, commodities and ability to access or create distribution networks*. At the same time, they are well-placed to access large, densely populated urban markets. Locally produced foods flow do not flow into regional (urban) markets efficiently. Opportunity exists improve the distribution systems so that it can more effectively signal market demand for a reliable supply of sustainably produced food.
- *Farm enterprise models in the basin fall into one of three classifications: owner-operated, (short term) leased, and Plain Sect farms*. These farms are of small to mid-size (less than 150 acres). The enterprise model directly affects the ability and economic viability of adopting BMPs that offer longer-term returns (in soil health or water quality). For example, the lease model limits availability of hard infrastructure/assets (land, barns) that can be used as collateral for the loans for BMPs. Only the farmer-owned operations are likely to implement sound land use practices that restore and protect water quality.
- *Basin farmer demographics s are inline with national trends, with the average age increasing (most over the age of 58*). The increasing age highlights the need and potential opportunity of transitional farm planning for the next generation of farmers in adopting greener and more environmentally-oriented practices (e.g., GMO free, organic, etc.) and/or farmland preservation.

Preliminary Recommendations for Paths Forward

The interviews drew attention to interventions that focus on aggregation so that investments can reach scale by overcoming the challenges of a fragmented industry. Below are four ideas that emerged, building on principles of market-like incentives to achieve stronger environmental performance.

- **IDEA #1**: Develop a model of pay for performance for farm service providers (Conservation Districts, extension services and farm contractors) that is focused on farm/regional adoption of practices that deliver water quality improvements (through BMPs are in place and functioning fully). This concept focuses on promoting technology and state of the art practices that would typically be contracted by farms.
- **IDEA #2**: Bridge financing to facilitate the conversion from conventional to organic farming.
- **IDEA #3**: Investment in service providers that supports value chain coordination and other shared business transaction platforms and/or services that enhance the price signal for “greener” commodities.
- **IDEA #4**: Investment in service providers that assist in estate/succession planning that integrates environmental objectives, such as ecosystem/carbon credits, easements, buffers, conversion from conventional farming practices and other greening practices.

Appendix F: Agriculture Forum Notes

William Penn Innovative Financing
Agriculture Forum – February 11, 2016 – Brandywine River Museum

Meeting Notes

Farm enterprise models:

- Confirmed farm enterprise models are: plain sect, leased and farmer/family owned and operated.
    - Leased farms are possibly farms in transition from the older to younger generation
    - Family-owned farms can be 'corporate' farms
- May need to include integrator model (as seen with swine and poultry) where the farmer owns the land (and the waste) and the integrator (e.g., Perdue or Bell and Evans) owns the animals and feed. (Note - In the contract system, the farmer usually provides land, labor, housing and equipment, utilities and litter and the integrator owns the bird, paying a stipend to farmer for food, medicine, and fuel.)

Factors to consider in developing a strategy to address the environmental impacts of agriculture:

- Design to the small- to mid-size farm (e.g., 85-125 acres and 200-400 acres, respectively).
- Segment the food chain and identify who drives the market (e.g., distributors, institutional food service providers).
- Educate the "new" farmers (e.g., hobby farmers) connecting retiring farmers /lands with new farmers (promoting PA Farmlinks) also promoting how to better connect farm products to dense urban markets.
- Partner with: (i) banks to educate farmers on financial incentives, such as REAP; (ii) Mid Atlantic Farm Credit; (iii) Economic Development offices.
- With existing funding/financing streams:
    - Look for opportunities to "tweak" existing tools rather than inventing new ones;
    - Find the triggers for stewardship when farmers access funding/financing;
    - Demand more for payments or to access a program (e.g., CREP buffer payments, PA Clean and Green Program); and
    - Consider lower cost options, such as right of first refusal in development rights.

Devising a strategy to address the environmental impacts of agriculture:

- Needs to be holistic and layered: sending reinforcing signals for "green" farming from all sides – i.e., *upstream* which provide inputs to farms (e.g., feed suppliers and farm services) and *downstream* which is the value chain beyond farm gate (e.g., integrators, distributors, wholesales, buyers, consumers).
- Funding needs to be proactive not reactive. Identify areas of growth or change – e.g.,
    - growing presence of Bell and Evans (poultry integrator)
    - farms in transition (intergenerational transfer or new famers)
    - emerging markets / demand for products.
- Build a team that includes PRI / banks /accountants / lawyers not just practice change folks.

Vetting ideas - Succession planning

- The strategy is broader than just succession planning. It's about addressing transition planning for two distinct groups: intergenerational transfers and "new" farmers.
- Rational for targeting transition planning: assists in retaining land in agricultural production and provides opportunity to introduce changes (i.e., more environmentally friendly) in farm management/operations.
- Transitioning farms present an opportunity for changing farm management practices and/or entering into new markets.
    - The new farmer/owner tends to be heavily in-debt by financing the buy out. In order to invest in the farm requires a business plan that set out increased revenue from using the same land base (e.g., production expansion or diversification).
- Need incentives for two audiences:
    - older generations to transfer/release farms sooner; and
    - younger generation to invest in environmentally friendly practices.
- Need in person service to facilitate transitions. 'Self-service' tools have had limited success (i.e., tend to be underutilized). Possible reason is that these transactions are built around trust.

Vetting ideas - Organics

- Assistance in transition period is possibly a 'hurdle' to greater adoption.
- Other possible barriers are: (i) lack of price premium to make (ongoing) certification / paperwork worth the effort. Organic milk is one of the few examples where supply has not been able to keep pace with demand (i.e., preserving the price premium); (ii) perception market/demand for organics is not strong enough.
- Organic grains – while demand and price signals seem strong enough, not necessarily commodity that can be grown in southern half of watershed at sufficient scale.

Further research needs:

- Hot spots, concentrations of agricultural commodities, mapping agricultural commodity sources across the watershed
- Understanding where agricultural products go.
- Codify expert group reflecting upstream and downstream participants/representatives.
- Consider labeling for DE River Basin products with branding promoting sustainable, water quality based practices.

Attendees

- Jim Baird, American Farmland Trust
- Jim Barham, USDA, Agricultural Marketing Services
- Clare Billett, William Penn Foundation
- Jan Bowers, Chester County Water Resources Authority
- Ted Bowers, Fulton Bank
- Wayne Brubaker, PA Farm Bureau
- Nina Chen, Nature Conservancy
- Pat Coady, Seale and Associates
- Denise Coleman, USDA Natural Resources Conservation Services
- Matt Erhart, Stroud Water Research Center
- John Goodall Brandywine Conservancy
- Peter Hughes, Red Barn Consulting
- Ann Karlen, Fair Food Philly
- Ellen Kohler, The Nature Conservancy - DE
- Sean McKinney, Ephrata Bank
- Tess Schlupp, PennVEST
- Joel Semke, PA State Conservation Commission
- Albert Guiney Engel, Environmental Finance Center
- Jill Jefferson, Environmental Finance Center
- Naomi Young, Environmental Finance Center