



Droits de Propriété et Développement du Diamant Artisanal (DPDDA II)



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Road Map for the Development of an eCommerce Marketplace for ASM Diamonds

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December 2015

I. Context: The USAID-funded Property Rights and Artisanal Diamond Development (PRADD II) project aims to increase the volume of diamonds that enter the legal chain of custody while improving the livelihoods of artisanal mining communities. PRADD II is a 5-year effort (2013-2018) currently implemented in Guinea and Côte d'Ivoire. PRADD II has critically examined opportunities for innovations in the ASM value chain that could contribute to improved livelihoods, enhanced internal controls, and better natural resource management. After commissioning a scoping study completed in December 2014, PRADD II organized a workshop in Grand Bassam in January 2015 during which a number of innovations were identified as meriting further exploration. One such innovation is an eCommerce marketplace that would more directly link ASM miners with purchasers of diamonds. Such a platform could stand to contribute to traceability, increased incomes for miners, as well as incentivize better governance and improved labor and environmental conditions.

PRADD II believes that the post-embargo context and the project's exceptional stakeholder relationships make Côte d'Ivoire fertile ground for testing such a challenging and potentially path-breaking idea. Such endeavors build upon years of reflection and engagement under PRADD I, including a 2011 feasibility study on direct marketing of artisanal diamonds from Liberia and the Central African Republic, and a 2012 workshop in Bangui with diamond industry actors to that effect. The idea also coheres with U.S. development policy that seeks to support game-changing innovations developed through public-private partnerships, an approach exemplified by the USAID Global Development Lab. Meanwhile, the diamond industry itself is going through a number of structural transformations—including the rise of online retailers in the United States and the bankruptcy of dozens of cutting and polishing facilities—spurred by a long-term slump in rough diamond prices, reduced wholesale margins, and a growing trend of marketing to new generations of “ethically-minded” consumers.

In November 2015, PRADD II Country Director Terah DeJong and Tetra Tech Staff Associate Jonathan Ellermann carried out a mission to Amsterdam and The Hague to explore the feasibility of such a platform. The trip was proposed by Richard van Hoolwerff, the Côte d'Ivoire/Liberia Country Director

of Dutch NGO Spark, which specializes in business development in post-conflict environments. Mr. van Hoolwerff had participated in the field portion of the December 2014 scoping study as well as the January 2015 workshop in Grand Bassam, and had urged those consultants present to consider how new technologies could be harnessed to shake up the diamond supply chain. As Amsterdam is a hub for both the diamond trade and technology entrepreneurship, the trip provided abundant chances to explore the opportunity with stakeholders working in these fields. As part of this trip, DeJong and Ellermann developed a draft “Pitch Deck” for the venture (called *Gemia* for the sake of the discussions). Pitch Decks are a commonly used tool in the technology startup space to survey the interest of the idea among key stakeholders; including potential investors, channel partners, and customers. Key meetings and discussions during the trip, which have informed this roadmap, include:

- [Richard van Hoolwerff](#), SPARK Country Manager Liberia & Côte d'Ivoire: As noted, Richard originated fundamental parts of the eCommerce platform idea, notably the idea that an app and cell phone could be used to break open the closed diamond supply chain. In addition, Richard has brought fresh perspectives on the diamond supply chain, and wrote a concept note in late 2014 that helped inform the platform idea. Richard was pivotal in helping DeJong and Ellermann set up meetings with his network in Amsterdam, and helped to organize the IGNITE! Conference, which coincided with the visit and provided opportunities for meetings and networking.
- [Chid Liberty](#), CEO, Liberty & Justice (L&J) and Uniform: Chid is the co-founder of [Liberty & Justice](#), Africa's first Fair Trade Certified apparel manufacturer. Chid has a background in technology, startups, finance, West African supply chains, and is leading L&J's expansion in Liberia and the region. [Chid is a Social Venture Network Innovation Award winner](#) and a respected thought-leader on social entrepreneurship.
- [Steve Bierman](#), Director, [Gassan Diamonds](#): Steve is an expert in rough diamond valuation, and diamond cutting & polishing. Steve's feedback was important to better understand the needs of a large jeweler and rough diamond purchaser like Gassan. He stated his interest in the project and willingness to support pilot tests of the technology for market suitability and fit.
- [Barry Rhodes](#), Founder and CEO, [DeVindt Diamonds](#): DeVindt is a startup ethical jewelry company, with an interest in improving environmental, economic and social sustainability in the mining sector. Mr. Rhodes is trained in crystallography, and expressed his interest (from a marketing and social justice standpoint) in such a platform to provide him with traceable ASM gemstones.
- [Niek van Dijk](#), BoP Inc.: Niek leads the [Inclusive Business Accelerator](#) platform for BoP Inc. The recently launched IB Accelerator connects entrepreneurs to different players in the startup world, including investors. Niek saw the Gemia concept as a high-potential disruptive technology, and has opened up his network to us going forward as necessary.
- [Ben White](#), Founder, Venture Capital 4 Africa ([VC4A](#)): VC4Africa offers specific services for entrepreneurs and investors, including running the back-end system for the IB Accelerator platform mentioned above. Ben was interested in the concept after explanation and discussion, and said he would be willing to remove the normal restriction on extractive industry ventures for us, should we be looking for funding and want to join the site.
- [Jasper Flapper](#), the Project Portfolio Manager at Engineers without Borders Netherlands (EWB): Jasper has shown interest in supporting the development of the stone valuation

technology development. More information on these discussions and EWB's potential role is below.

- **Thierry N'Doufou**, CEO, [Qelasy](#): Qelasy has engineered a durable, waterproof education tablet and a suite of applications used in West Africa. We discussed potential ways the Gemia platform could use such a tablet.

The mission supported the thesis that such a platform, if suitably developed, may be able to harness technology and the market to create a disruptive miner-to-business trading platform for the transparent and equitable sale of ASM gems. The pitch deck and this road map will begin moving this idea from the conceptual stage towards the feasibility stage, with the eventual goal of supporting the launch of a standalone venture that can obtain both public and private funding and support. These documents should allow USAID to determine how and if they wish to continue their investment in this risky but potentially path-breaking concept. This document explores next steps for technology development, business development, and avenues for venture financing that can be used to support this initiative.

II. Technology Feasibility Plan: Fundamental to the Gemia marketplace is the development of two distinct technologies: Precious Stone Valuation Technology (PSVT) and the eCommerce Marketplace Portal (the Gemia portal). Separate feasibility studies and approaches to development are needed for both.



The **PSVT** must allow for buyers to bid on stones without physically inspecting them. As we see it, the PSVT should have the following capabilities: producing a “fingerprint” of a stone or parcels using detectable unique characteristics; producing sufficient information to allow rough diamond buyers to determine a reasonable price (with a margin of error); and producing a price range and/or floor price based on detected characteristics. The first capability is necessary for traceability and to foster trust. The second is necessary to allow a buyer to purchase without physically inspecting the product. And the third is necessary to set a “floor” price for an auction as well as provide an objective basis for determining a fair price for miners.

The latter would be achieved with an algorithm that calculates the lowest probable value of the stone based on a classification and rough-to-polished conversion methodology linked to international market polished price lists. If the PSVT can calculate the floor value, this will allow bidders to enter

into an auction with the confidence that a stone is bid-worthy. In addition, this could open the possibility of objectively defining what constitutes a “fair” minimum price to miners. However, as miners currently receive only 1-10% of the value of the stone, there is a wide margin of opportunity for the marketplace of bidders to offer even higher prices for stones. The PSVT will use, at a minimum, the 4C’s of diamond quality to develop this floor price algorithm. Our initial research shows that, in concept, this may be possible. For the PSVT to be viable it will need to measure *carat* weight (possible), *cut* (or crystal *shape* in a rough stone – possible), *color* (possible within some margin of error), and *clarity* (possible with some margin of error). Other variables including fluorescence, inclusions and the crystal shear planes could also be integrated in principle.

The PSVT should also ideally integrate with existing rough planning software (used to calculate and maximize cutting yields through 3-D mapping), and could in principle be developed in partnership with owners of existing technologies such as Sarine Technologies (Israel), OctoNus (Russia) and OGI Systems (Israel). Finally, there could be several “levels” of PSVT technology, with larger stones (>4 carats) likely requiring less margin of error and full 3-D mapping of inclusions. With respect to next steps, the following are different alternatives to PSVT technology development:

- **Alternative A:** During the Amsterdam mission, DeJong and Ellermann were able to explain the concept in person with to Jasper Flapper, the Project Portfolio Manager at Engineers without Borders Netherlands (EWB). EWB offer engineering consulting services for NGOs and governments working in the development sector with an inability to source the engineering expertise in-country, and without the financial resources necessary to hire for-profit engineering expertise. At this time, development of the PSVT meets all of these criteria. Mr. Flapper sounded positive on the concept as a potential EWB project, and requested that we apply for their services. We need to define how far EWB should go developing the PSVT, as their scope could be to develop a feasibility plan only, or to develop a feasibility plan and a working prototype. There are questions that need to be answered regarding patent ownership for the concept, which may or may not be possible due to the competitive landscape, as this is a major valuation factor for startup companies, as well as potential legal concern.
- **Alternative B:** As part of the launch of the Gemia platform, money could be raised from either private or public sources to fund technical feasibility and prototyping. We see this as a potentially viable route of action, but likely only possible after a basic feasibility study is completed, which would justify investment in prototyping.
- **Alternative C:** The team could approach existing companies like Sarine and gauge interest in collaboration or partnership to develop the PSVT. This may be a difficult proposition to sell and could raise questions on ownership and interests.
- **Suggested Approach:** We suggest that a EWB request be submitted to further explore if a partnership is possible. The request would focus on the feasibility work and be submitted by PRADD II. After the feasibility stage, a solution for prototyping will be found (either with EWB partners or others, such as a university or company). Prototyping will require testing with rough diamond buyers, which should not be an issue, with both Gassan Diamonds and De Vindt Diamonds expressing openness.

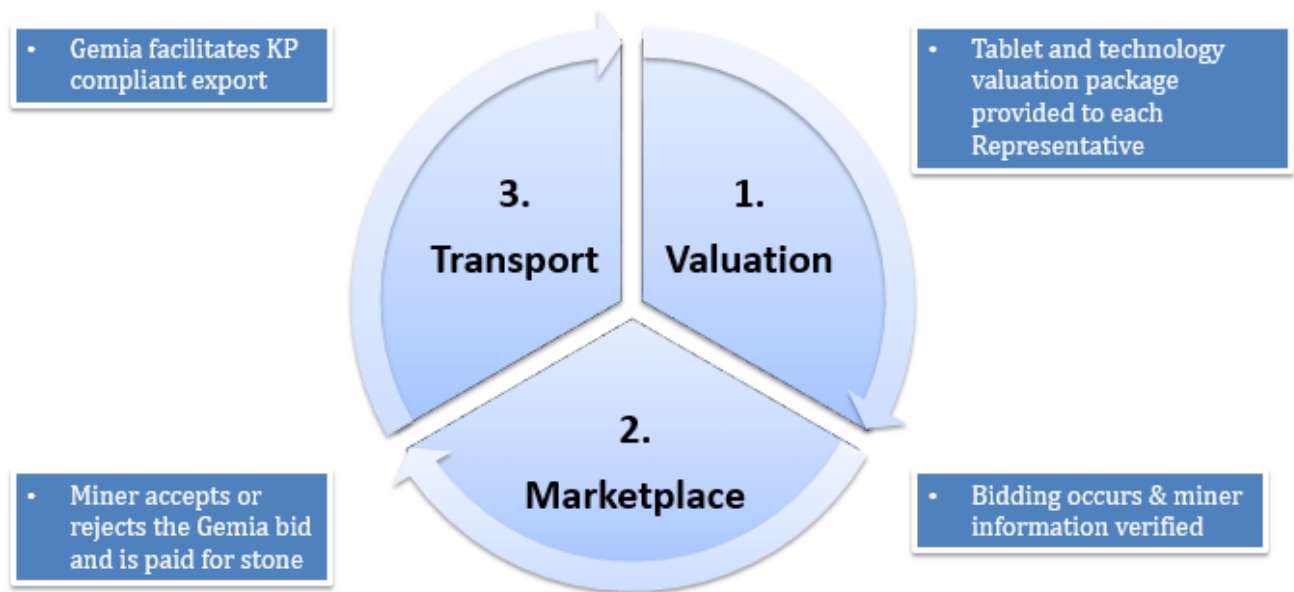
The Gemia Portal technology is envisioned to function as an eCommerce auction or sales platform. The auction model, which assumes multiple rough buyers, will likely take the form of an *English auction* where Gemia will announce the starting bid (set at the PSVT floor), and the highest bid above that number will win the auction. The seller would also have the option of rejecting the offer, even if the floor price is met. Other options to explore are a *first prize sealed-bid auction*, which hides competitor's bids from each other, or a sales platform whereby a single rough diamond purchasing expert - with a partner cutting and polishing factory - make an offer based on up-to-date market conditions. The platform would then facilitate an auction for the polished stones to certified jewelry manufacturers, with a portion of proceeds filtering back to the original seller. While the business feasibility plan will explore and propose these and other models, a technical feasibility phase for the portal's structure must occur. The following are options identified ways to move forward the Gemia Platform:

- **Alternative A:** Work with a software engineer to develop a limited auction platform by the entity who will bring this technology to market. This option has the advantage of developing a proprietary secure infrastructure that will keep costs low and create the conditions for effective scaling up and customization.
- **Alternative B:** There may be opportunities to develop the platform in a simplistic manner using off-the-shelf solutions for the purposes of a pilot test. For example, RainWorx Software (based in Vermont) offer a customizable auction solution and are approximately \$3,000.00 for the first year, and \$500.000 annually, but would need adjustments so that it could also be complimented by field information gathered from the PSVT.
- **Suggested Approach:** We suggest that as part of the venture teams' process of applying for seed funding (either DIV or venture funding) a wireframe for the eCommerce portal be developed. One potential partner could be DeJong's younger brother, a front-end software engineer who is willing to do this at no cost to support such an initiative. In addition, Tetra Tech's technology for development (T4D) Unit could review the wireframe at no cost. A more detailed wire-frame and prototype would have to be developed concurrently with the Business Feasibility Study and the PSVT Feasibility study, as all components influence each other.

III. Business and Financial Feasibility Plan: While initial discussions show that the concept of the Gemia platform is interesting to stakeholders and could potentially be brought to market, it is essential that a full financial feasibility plan and a business plan be created for the concept. Critically important is research on market conditions, average margins for rough stones, the expenses for launching and sustaining such a business, legal review and analysis, breakeven analysis, and more detailed competitive analysis. While it would likely be outside of PRADD II's mandate to fund such a plan, the project could contribute its network and field knowledge to this plan.

- **Alternative A:** Hire a consultant through PRADD II to develop necessary research on the supply chain that would drive the business plan of such a venture, with oversight from Ellermann and DeJong. This was the proposal from Catalyst Resources Development Group (CRDG), the PRADD II sub-contractor on its supply chain initiatives, and the implementer of the innovations scoping study. Funding for basic research on the economics of the diamond trade in Cote D'Ivoire could be done under a second sub-contract.
- **Alternative B:** Develop all business research outside of PRADD II, but with the project's technical input. This would require outside sources of funding.

- **Suggested Approach:** Business plan development for such a venture should likely be done outside of the PRADD II project. Business plan development could be funded through the DIV funding (should DIV accept), or other sources of seed capital. PRADD II will need to remain involved as a collaborative technical partner in facilitating access to and contributing relevant information to support this platform.



IV. Venture Structure: In any possible configuration of the Gemia Platform there needs to be a legal entity developed that can one day stand on its own without USAID funding. The strategy for the launch of the venture is a key aspect of the platform’s success, as each alternative carries different pros and cons. Important considerations to weigh when choosing the venture structure include: maximizing social benefit, avoidance of conflicts of interest, likelihood of success, and ability to obtain financing from public and private sources. Options for the structure of the venture (which could be combined in different ways) include:

- **Alternative A:** Launch a special purpose vehicle that is able to apply for public funding (see finance section below) as well as work with Engineers without Borders, in order to conduct the necessary technology feasibility studies for stone valuation that this concept depends upon. The funding directed to this vehicle would be used for implementing the above feasibility studies, prototype development and proof-of-concept testing. It remains to be seen if technology and concepts developed with USG funding would give the USG intellectual property rights. This would likely depend on the type of USG funding and the specific terms and conditions. This vehicle would likely be in the form of an LLC. This option may somewhat limit future ability to raise private sector funding should a licensing agreement be required.

However, if intellectual property is retained, rights would be easily transferrable to a successor corporation after the piloting stage.

- **Alternative B:** Establish the Gemia Platform as a US-registered Public-Benefit corporation (PBC). PBC's are corporations that allow for public benefit to be charter purpose of the corporation, in addition to the traditional goal of profit maximization for shareholders. Public-Benefit corporations must build purpose, accountability, and transparency into the core of their business model. This PBC would immediately be able to apply for certain types of public funding (DIV), as well as work towards raising other sources of funding (foundation funding in particular, such as the C&A Foundation) to fund feasibility studies. It is essential that team members of the Public-Benefit corporation have a variety of skills and experience, including: startup familiarity, bringing technology to market, artisanal and small-scale mining expertise, West Africa experience, and attracting venture and blended capital. It is important to convey to all stakeholders, including any investors, that this venture will likely take many years of testing, iteration, and scaling before it is able to be profitable. Chid Liberty and Richard van Hoolwerff have expressed their willingness to work with Ellermann and DeJong to launch this PBC. One option could be to launch this PBC as a "Liberty & Justice company", which would also give the venture useful support (lawyers), infrastructure (office space), network (VC and Private funding connections), and the audited financials of an established socially responsible business that operates in West Africa.
- **Alternative C:** Partner with an established non-profit entity, such as a community development fund or an organization like the Diamond Development Initiative (DDI), to apply for the grant funding to conduct research and feasibility funding. If the feasibility studies prove that a viable platform may be able to be developed, then a new entity could potentially be developed in the future. Another mechanism for this could be the Liberty & Justice Community Development Fund – a nonprofit fund hosted at the Tides Foundation - that supports programs in economic empowerment, education, and healthcare.
- **Alternative D:** PRADD II works directly with EWB during the PSVT and economic feasibility stages, and the project team then explores which alternative above should be explored in order to launch the platform, depending on the outcome of these studies. Under this scenario funding would have to either come from the PRADD II mechanism or else some other entity like Tetra Tech would channel the DIV funding.

Suggested Approach: In assessing different options, a number of considerations must be taken into account. First, as PRADD II is absolutely essential to the proof-of-concept phase, due to its social and intellectual capital, and its role in originating the concept, the choice of structure must be compatible with PRADD II and avoid conflicts of interest. Second, given that key stakeholders and partners will likely change as the project moves from a potential concept to a proof of concept, it is prudent to opt for a structure that maintains maximum flexibility and allows for maximum creativity. For both of the above reasons, creating a full corporation at this stage—even a PBC—may be premature. However, keeping it purely in the non-profit realm may hinder future potential by making intellectual property ownership and a transition to a company difficult.

Similarly, using an entity like Tetra Tech may lead to a conflict of interest and be difficult to negotiate practically given the multiple potential sources of funding. In the medium-term, it will be absolutely necessary that this venture leverage both public and private sector funding, as well as make use of market mechanisms including equity financing, and this requires a pathway that will transition to a

for-profit stand-alone entity when the timing is right. A special purpose vehicle that benefits from the L&J platform may be the most viable solution. The vehicle would be designed to be time-bound to the feasibility and pilot stages, would offer a non-PRADD non-Tetra Tech entity to avoid conflict of interest, and would be set up in such a way so as to pave the way for a transition to a PBC or other form of corporation after several years. However, all of the above are options worth exploring, and all partners should have a frank discussion about what is best to advance the common goal of harnessing innovation to make the diamond supply chain more fair and efficient, especially for the miners.

V. Venture Financing: A variety of public and private sector financing options exist to pilot test this concept. Perhaps the most fitting form of *public sector investment* is the USAID-funded **Development Innovations Ventures** program. Development Innovations Ventures [has been recently extended](#) for another year, until November 2016, and supports the piloting and testing of innovative solutions to international development problems. DIV employs a staged funding model, with size of investment commensurate with evidence of potential for success. The Stage One DIV Funding, which could contribute between \$25,000-\$150,000 of seed funding towards the concept, is meant for “Introducing an innovation to target customers/beneficiaries in a developing country context to gain an early, real-world assessment of potential for technical, organizational, and financial viability.” The Gemia platform is a good match for this, because of the social impact, possibility for scale, and funding need.

Business plan competitions are also often a good way to fund social enterprises at the conceptual or pilot phase as they offer prize money, mentoring, and incubator space. For the Gemia platform this could include the William James Sustainable Business Plan Competition, Rethink Supply Chains Competition, StartUp Challenge, MassChallenge, Y Combinator, and many others. USAID, through the Global Development Lab, has also shown support for the Global Entrepreneurship Network, which links to angel investment and business competitions in the development space. The downside of business plan competitions at this stage is that it may give the idea too much exposure which could harm its chances of success given the need for discreet smart development and testing.

There are also a variety of **social enterprise grants and foundation grants** that exist, including the Skoll Foundation, the Kaufman Foundation, C&A Foundation, and the Segal Family Foundation. These may offer more low-profile ways of leveraging additional funds.

Private sector financing options are also diverse, and should be wisely selected based on appropriateness. The Gemia Platform may be able to raise **equity capital** funding from social investors, or from typical angel investors. With the Gemia platform having a non-existing value at this time, this may not be a wise move in the near future, as any investment would be worth a large percentage of the venture. The website Venture Capital for Africa (VC4Africa) would be a good avenue for angel investments, however for inclusion in this network, ventures must be beyond the concept phase and have a working prototype, product or service. Ellermann and DeJong have also identified other potential avenues for angel investment for the venture, however much more work needs to be done prior to being able to secure such seed funding. Debt capital (particularly **sustainable entrepreneurship debt**), could also be able to be raised after the pilot stage, as could crowdfunding or philanthropic funding. Developing the financing plan will be a key and immediate role for the venture team after initial feasibility studies and early field testing have been done.

Suggested Approach: We suggest the venture team apply for a DIV grant and foundation funding after a venture structure has been selected. DIV and foundation funding will go to support platform

development and business plan development. The PSVT feasibility study could be completed through a PRADD II partnership with EWB. The implications with respect to intellectual property and licensing that should be explored, including the option of developing open-source specifications and content. PRADD II would then gain approval through its annual work plans to support the feasibility studies and pilot phases. However, it is suggested that this support be limited to PRADD II's intellectual and social capital, as well as perhaps support in the pilot phase to communicate with stakeholders and acquire buy-in for testing the idea, but not to be involved in the actual transactions. The proposed work plan on the following page follows this suggested approach, which is of course subject to discussion and modification.

Illustrative Work Plan:

GEMIA PPP	TASK	Month																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Road Map Work Plan		D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M
1. EWB	Submit Engineers Without Borders Interest Application	█	█																
2. Valuation	EBD Technology Feasibility Study*		█	█	█														
3. Gemia	Structure venture to capture public and private support			█	█														
4. EOI	Submit DIV EOI and Develop Platform Wire Frame				█	█													
5. DIV	DIV Phase One Application					█	█												
6. Field Research	Financial Feasibility Research						█	█	█	█									
7. Platform Dev	Technology Development Necessary to Run Pilot									█	█	█	█	█	█				
8. Fundraising	Private Capital Fundraising												█	█	█	█	█		
9. Pilot	Pilot Phase Test - CDI														█	█	█	█	█

*Contingent on EWB accepting research project. If they do not accept, then research funded through DIV or Private sector capital.