

## *Term of Reference (ToR): Global PES Trading Platform*

The Nature Conservancy (TNC) and The World Resource Institute (WRI) intend to develop a Platform Prototype to facilitate environmental transactions defined as any agreement designed to fund changes in land use and water quality for the purpose of generating positive environmental impact, such as Payment for Environmental Services (PES), natural climate solutions based carbon offsets and credits, watershed payments schemes, and green and blue bonds. This prototype will be firstly developed to be implemented in a pilot landscape of the Atlantic Forest in Brazil but will be designed with the aim to have a global outreach. The prototype will consist of the following elements:

- Web application and API for integration;
- Mobile application;
- Database.

To do so, we are seeking an expert to establish all system requirements, including business rules, diagrams, integrations, etc. We flag that, depending on the performance of the consultant, TNC and WRI may hire the consultant to follow the whole development process.

### OBJECTIVE

- Hire an expert to analyze and specify all the requirements for the transaction platform, considering the development of a web and mobile application as well as the database and its integrations. The consultant will use as reference the mockup<sup>1</sup> that was developed for the new platform.

### MINIMUM QUALIFICATIONS

- Bachelor's degree in computer science or proven experience in project management-related area with at least 6 years of experience in related jobs.
- Have proven experience in requirements engineering, process modeling, business analysis, scrum development and software development.

### DESIRED QUALIFICATIONS

- Multi-language skills and multi-cultural or cross-cultural experience appreciated.
- Ability to interpret guidelines and evaluate information and adapt accordingly.
- Experience defining and implementing applications for virtual transactions, such as rental, mobility, purchase apps, etc.
- Experience with Geographic Information System (GIS) projects.
- Experience defining and implementing blockchain business models.

### RESPONSIBLES

- Work with different stakeholders in order to define system business rules.
- Detail the information to be covered in the application through interviews and meetings with the users involved, generating the survey, standardization worksheets and dictionary of this information for the support tools to be used.
- attend weekly meetings with the parties involved in the project to present progress.

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<sup>1</sup> [TNC | Serviços Ambientais \(techsocial.com.br\)](https://techsocial.com.br)

- Create diagrams to be applied in the process, bringing concrete results of the meetings and with due detail in order to contain, in its conception, the normalization rules established by the conceptual modeling techniques. In case it becomes necessary to make a validation (feedback) with the user on the decisions made in relation to the structure of the business model that is generating doubts.
- List and detail all API needed for integration such as transactions at different exchange rates and deforestation and forest degradation alert reports (e.g. Mapbiomas Alert, Global Forest Watch).

## OUTPUTS

The consultant must deliver a work plan and a complete report of the system requirements. The outputs will be evaluated and, if approved, the payment will be done.

- **OUTPUT A** (Work Plan) – the work plan must contain the methodologies, steps and schedule of activities. This document must be delivered one week after the kick-off meeting.
- **OUTPUT B** (Product Vision Document or PVD) – each PVD items/definitions must be evaluated and validated by the TNC and WRI team before delivery of the final product. The work plan must consider it.
- **OUTPUT C** (Full System Requirements report) – the final report must include at least: the product vision; business rules, functional and non-functional requirements; user profiles workflows; class diagrams; entity–relationship model and APIs for integration including its description.

## DELIVERY DATES

- The output A must be delivered to TNC and WRI by 15 days after the signature of the contract;
- The output B must be delivered to TNC and WRI by 45 days after the signature of the contract;
- The output C must be delivered to TNC and WRI by 90 days after the signature of the contract;

## VENDOR SELECTION PROCESS

Vendors will be evaluated on the following criteria:

1. user friendliness of proposed solution;
2. attention to detail;
3. strong expertise in designing/developing secure mobile and desktop tools with user-input matchmaking/marketplace functionality and other design requirements specified above;
4. track record of successfully managing customer feedback, budgets, and deadlines;
5. project Management and quality assurance methodologies;
6. ability to deliver product in the timeframe specified;

## 7. PROPOSED TIMELINE

All questions about this ToR must be received via email to the contact below by **January 30th, 2021**.

Proposals submitted by **February 2nd, 2021**.

Vendor selection: **February 10th, 2021**.

Design and development kick-off: **February 12th, 2021**.

Proposals should be submitted electronically in PDF format to [leonardo.ivo@tnc.org](mailto:leonardo.ivo@tnc.org).

## ANNEX I – GENERAL FUNCTIONALITY

The main functionalities can be identified through the application [mockup](#). In addition, to consolidate the marketplace, a variety of support functions are critical to increase volume and reduce costs. To keep it simple, we have grouped them here in four general categories:

- Convenient onboarding - meaning it is very easy for buyers and sellers to create accounts and submit their bids and offers;
- Reliable information - meaning buyers and sellers have a sound basis to evaluate price and quality before they transact;
- Transaction execution - meaning buyers and sellers can rely on the market to execute and support the transaction (including payments) – often without having to interact with each other;
- Post-transaction support - meaning buyers and sellers can rely on the market to ensure their satisfaction.

We believe that unlocking a liquid global market for environmental transactions requires delivery of all the supporting functions of an efficient market. While the full functionality of the system has yet to be defined, we can use the analysis so far to clearly identify at least four needs by these markets. These can be categorized as:

- Seamless transaction Registration and Technical Support;
- Reliable and comparable estimates for impact and price;
- Transaction Execution and Management;
- Contract Enforcement and remote Monitoring, Reporting and Verification (MRV).

The platform, mobile app and the desktop version should satisfy the following requirements/ functionalities:

- Property registration - sellers should be able to register and upload all necessary information without ever having to leave their property. The seller could create a shapefile by walking around the property and marking coordinates with their phone. A seller could literally have an offer ready in a matter of minutes. IT portion should work very close with the item 2, 3 and 4 below;
- Property registration legal analysis - sellers should be able to attach and upload all required documents instead of copying and delivering them. They could select from a catalog of actions designed to deliver specific ecosystem outcomes and have access to tutorials and on-line assistance to better understand how to select them. It is very important look at what are considered legal or not in each local where platform will put in place (legal questions), property registration, model of contracts, etc.;
- Property registration environmental services measuring - sellers should be able to select from a catalog of actions and interventions designed to deliver specific ecosystem outcomes. Consider a series of algorithms that can check qualification through direct interfaces with other systems, estimate

impact based on baseline information and new methodologies, and estimate pricing based on comparable transactions;

- Property registration environmental technical assistance - sellers should have access to tutorials and online assistance to better understand how to select environmental services and pricing, mapping their areas, uploading documents, etc. A kind of customer assistance/service should be created, including a service to solve eventual agreements and financial issues;
- Offer details - system must provide a broad range of information that can be combined into a standard indicator that makes ALL environmental transactions comparable. Comparability is one of the most essential components of a good market. The information could include exceptions to any qualification requirements posed by laws or the payer and information on specific remedial actions that would address them. The impact estimation could include all targeted and collateral benefits to the proposed stewardship change. The risk assessment could consider the broad range of external conditions for the specific property. The pricing estimation could be based on multi-tiered valuations that take all the other information into account. This would all be done without the heavy cost of boots on the ground. With all this information in hand, both the seller and the buyer can make efficient and informed pre-transaction decisions;
- Active bids – sellers must be able to access the terms and conditions of all bids placed on the system by buyers. This would enable them to design their offers to match the requirements of a buyer OR to confirm their offer meets specific criteria and accept the bid outright. This could be done through electronic contracting;
- Active offers - buyers must be able to see the details of every offer in the system and filtering them according to specific criteria. They can see details of the offer, being able to accept multiple offers by simply checking boxes.
- Transaction execution - Buyers should be taken to a screen for electronic execution of the transaction. After reviewing the terms of the agreement – which is customized based on the details submitted by buyer and seller – they approve the transaction. Message would be sent to the buyer to do the same. Money is transferred to a fiduciary account until the seller confirms. The seller would be paid at the appropriate time based on the terms of the agreement. It is important to note that this system would be able to facilitate payment for environmental services already delivered (like carbon offsets) and those to be delivered in the future (like payments for ecosystem services). For these future impact agreements, the system would provide back-office functions that monitor compliance and payments.
- Transaction execution (currency exchange) – An API must be implemented to provide the real-time currency value for dollar, euro and real;
- MRV - a real-time reporting function should be implemented considering data from different remote sensing sources (drones, satellites, coping, etc.) in order to check deforestation, fires, etc. Consider an integration via API to access Mapbiomas Alert data in Brazil;
- Breach of contract – the consultant, with partners, will need to define contract rules and penalties for cases of criminal fires, illegal deforestation, etc.

## 1. SYSTEM TECHNICAL REQUIREMENTS

### 1.1 WEB APPLICATION AND DATABASE

- The development of the proposed application must use free platform that has compatibility with SQL standard.
- Free and open source systems and software should be used, such as the Apache web server and Linux operating system.

- We recommend PostgreSQL database management system with PostGIS extension for geographic data.
- For the development of the backend application, JavaScript, Python or PHP languages may be used, as well as frameworks to optimize development (NodeJS, Django and Laravel).

## 1.2 MOBILE APPLICATION

- The mobile application must use native components of the operating system.
- The JavaScript language in conjunction with the React-Native framework may be used for application development or other frameworks that provide the development of native applications, for example Flutter.
- The application should provide data storage in both offline and online mode. For this, we recommend the Realm database.

## 1.3 SECURITY REQUIREMENTS

- Only authenticated users can access the system's sensitive and private information.
- The Hypertext Transport Protocol Secure (HTTPS) and Secure Socket Layer (SSL) protocols must be used on web application.
- Mobile and web applications must be protected against attacks by internal and external users (password attack, spoofing form/session, SQL injection, XSS attack, etc.).
- All input data (registration data, login, search fields) for web and mobile applications must be validated to avoid vulnerabilities in the system.

The password pattern including complexity, duration and expiration must comply with the standards established by the TNC, must be at least eight characters long and contain at least three (3) of the following four (4) types of characters: lowercase letter, uppercase letter, number and symbol.

## 1.4 SOFTWARE INFRASTRUCTURE AND ARCHITECTURE

- The development architecture should allow the application to be scaled in order to guarantee high system availability.
- Service-Oriented Architecture (SOA), Model-View-Controller (MVC) architecture standards should be considered when developing the application.
- Code versioning tools must be used, allowing TNC access to the code repositories of web and mobile applications.

## 1.5 DATA PRIVACY

- The data privacy policy must be presented in the web and mobile versions and minimally cover the General Data Protection Law (LGPD in Portuguese) and the General Data Protection Regulation (GDPR) of the European Union.
- The data privacy policy document must be detailed and straightforward specifying the way in which information will be stored, used, processed and removed in the future.
- A cookie consent notification should be included in construction of the online site.

## 1.6 ACCESSIBILITY

- The mobile application must work on multiple devices and the following operating systems:
  - Android (OS: Android 5.0 and up);
  - iOS (iOS: (10-12) and up).
- Online version of the application should be accessible via CHROME (most recent 3 versions), Edge (most recent 3 versions), Firefox (most recent 3 versions), Safari (most recent 3 versions) browsers.
- Mobile app must be accessible in geographical areas with weak or unavailable WiFi or Cellular connection and should be able to store data on the local mobile device and automatically upload to the server where content is managed when WiFi or Cellular connection becomes available. Importantly, the mobile app's complete feature set should function successfully without a network connection.
- The online application should meet WCAG 2.1 level AA. ([Quick reference.](#)).

### 1.7 ANALYTICS

- Information about site usage should be collected via Google Analytics. The administrator uses Google Analytics (GA) and Google Tag manager (GTM) for tracking site activity. TNC can provide the relevant GA account and GTM container code. Please let us know if you see any issue with this approach.

### 1.8 LANGUAGE

- The GETs platform intends to be a Global platform, but the first prototype will be in Brazil, so the Platform should be developed in English and Portuguese languages.