AESC
Agri-Eco Smart Chain

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Ecological White Paper

Building the Digital Cornerstone for Future Agriculture
———Global AI-Powered Agricultural Big Data Service Platform

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1. Project Summary

This white paper aims to systematically elaborate on the core solutions of the global modern AI-powered smart agriculture service platform developed by the Bluepine Tech Foundation. By integrating blockchain, Web3, IoT and AI technologies, and combining RWA, RDA, and DeFi finance, the platform constructs a digital agricultural ecosystem characterized by "trustworthy data flow, precise service delivery, and fair value distribution." Centered on the assetization of agricultural data, the platform provides practical data service solutions, Delivers personalized content recommendations via AI algorithms., and establishes a standardized paid agricultural knowledge system. Relying on the AESC token issued on the Binance Smart Chain, the platform builds an economic closed loop, ultimately upgrading to its dedicated public chain, Agri-Eco Smart Chain, to achieve digital, intelligent, and decentralized innovation across the entire agricultural chain.

The platform has undergone technical validation: adopting a semantic blockchain and federated learning integrated architecture, it improves agricultural data query efficiency by over 45% and reduces storage space by 95%. The AI-powered pest and disease warning system achieves an accuracy rate of 92%, and in pilot projects for crops such as sugarcane and cotton, it has increased yield by 15% while reducing pesticide usage by 20%. Through the tokenization of real-world assets like farmland and crops via RWA, the platform has helped pilot farmers reduce financing costs by 30%-50% and decreased supply chain transaction disputes by 68%.

2. Industry Pain Points and Development Opportunities

2.1 Core Pain Points

1. Data Value Remains Untapped: Agricultural data is fragmented among farmers, enterprises, research institutions, and other entities, forming "data silos." Risks of data falsification and tampering further hinder its transformation into credible assets.

2. High Barriers to Technology Adoption: Small-scale farmers lack the capacity to apply advanced technologies such as AI and IoT. High-quality agricultural knowledge and technical services struggle to reach them efficiently, leading to imbalanced resource allocation.

3. Inadequate Financial Service Coverage: Agricultural assets suffer from poor liquidity and difficulties in valuation. Financial institutions are reluctant to provide loans due to high risks, resulting in farmers facing challenges in accessing affordable financing.

4. Unbalanced Value Distribution Mechanisms: Information asymmetry across the supply chain allows intermediaries to capture most of the profits, making it difficult for farmers and consumers to obtain fair returns.

5. Lack of Service Precision: Traditional agricultural services lack personalized adaptation, failing to provide tailored solutions based on crop varieties, growth stages, and regional conditions.

2.2 Policy and Technological Opportunities

1. Policy Support: Multiple countries globally are promoting agricultural digital transformation, with regions such as Singapore, Hong Kong, and Malaysia establishing regulatory sandboxes to encourage RWA and RDA innovations.

2. Technological Maturation: The immutability of blockchain addresses data trust issues, AI algorithm accuracy continues to improve, and the decentralized architecture of Web3 enables autonomous value distribution. RWA and DeFi have bridged the connection between agricultural assets and capital markets.

3. Market Demand: The global smart agriculture market size is projected to exceed $200 billion by 2028, with farmers increasingly demanding precision planting, risk hedging, and financing services.

3. Core Technical Architecture

The platform adopts a "Human-Machine-Thing" trinary integration architecture, constructing a multi-tiered technology system to achieve trustworthiness and efficiency throughout the entire process of data collection, processing, and application.

3.1 Technology Stack Overview

Layer	Core Technologies	Key Functions
Perception Layer	IoT, Satellite Remote Sensing, Drones	Real-time collection of soil moisture, crop growth, meteorological data
Network Layer	BSC, Semantic Blockchain, Sharding	Data certification, asset ownership confirmation, cross-node collaboration
Intelligence Layer	AI Algorithms (Image Recognition, Predictive Analytics), Federated Learning	Precise diagnosis, yield prediction, privacy-preserving computation
Application Layer	Web3 Protocols, DeFi, RWA Engine, Paid Knowledge System	Service delivery, value circulation, content monetization
Security Layer	ZKP, DID, Smart Contract Audits	Data privacy protection, identity authentication, risk prevention and control

3.2 Key Technological Innovations

1. Semantic Blockchain + Federated Learning: Transforms data such as crop phenotypes and meteorology into semantic feature vectors. Utilizes sharding technology to enhance processing efficiency, while employing federated learning to enable multi-party data sharing without privacy leakage.

2. Dedicated Agricultural AI Engine: Integrates three core models: Image Recognition (for pest/disease detection), Time-Series Prediction (for yield/price forecasting), and Natural Language Processing (for knowledge-based Q&A). These models are continuously iterated and optimized based on trustworthy on-chain data.

3. Web3 Identity System: Implements on-chain identity authentication for farmers, enterprises, and experts through Decentralized Identity (DID). Combines Zero-Knowledge Proofs (ZKP) to ensure privacy and security during data usage.

4. Standardized RWA Module: Establishes a tokenization process for agricultural assets including land, crops, and profit rights. Provides a comprehensive toolkit covering the entire workflow: ownership confirmation, valuation, on-chain registration, and trading.

4. Agricultural Data Service Solution

4.1 Core Objectives of the Solution

Break down agricultural data silos to achieve a closed-loop process of "trusted data collection - compliant circulation - mutual economic benefits ," enabling data contributors (such as farmers and cooperatives) to earn direct benefits while providing high-quality data support for the platform's AI services and financial applications.

4.2 Tiered Data Collection System

4.2.1 Collection Entities and Content

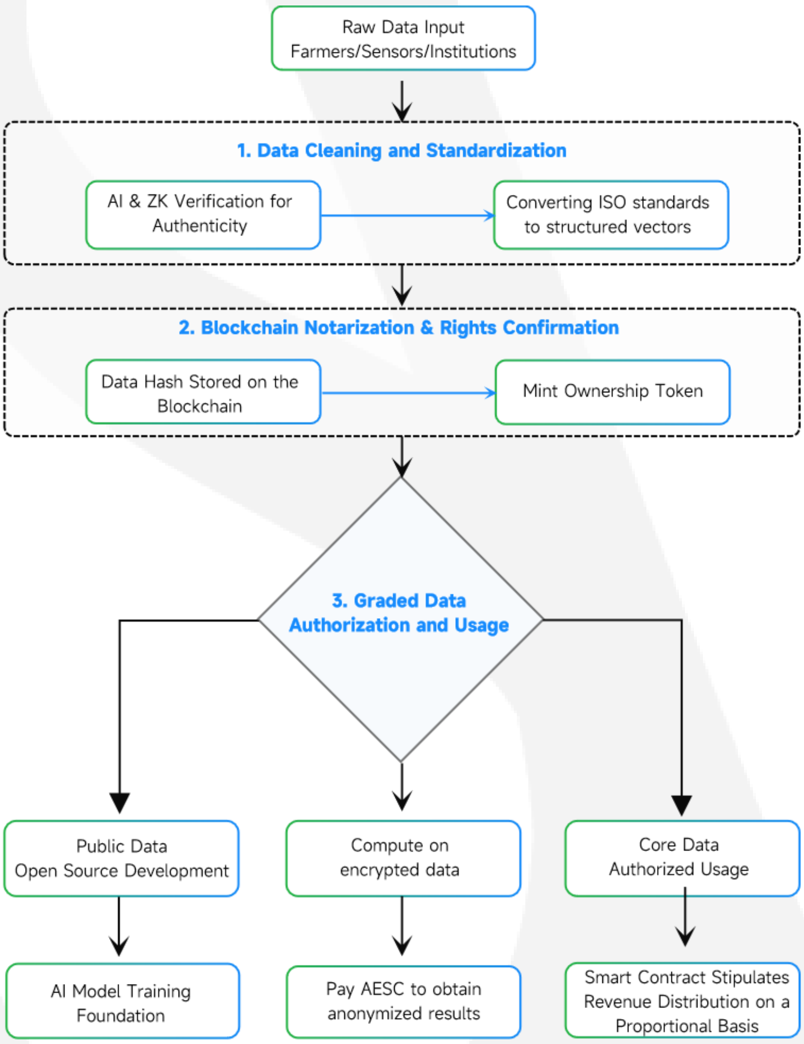
Collection Entity	Collection Content	Collection Method	Incentive Mechanism
Farmers/ Cooperatives	Planting logs, Crop growth, Input usage	Manual entry via mobile app + Auto-sync via IoT devices	AESC rewards of $0.1~1 per valid data entry
IoT Devices	Soil moisture, Temperature/ light, Pest/disease images	Real-time 5G transmission to on-chain nodes	Device owners receive 60% of data revenue
Third-party Institutions	Meteorological data, Market prices, Remote sensing imagery	API integration + On-chain certification via smart contracts	AESC service fees based on API call volume
Expert Teams	Diagnostic reports, Technical solutions, Variety data	Upload via knowledge platform + On-chain ownership confirmation	Content revenue sharing Data contribution rewards

4.2.2 Collection Device Compatibility

To accommodate varying farmer capabilities across regions, a "Basic Package + Advanced Package" equipment solution is provided:

1. Basic Package: Low-cost soil moisture sensors (unit price < $50) support Bluetooth connectivity for mobile data upload, with 50% of the equipment cost subsidized by the platform.

2. Advanced Package: Includes multispectral drones and smart irrigation controllers. These devices are tokenized using the RWA model, allowing farmers to pledge the equipment as collateral to obtain AESC-denominated loans for purchase.



4.3 Data Processing and Flow Mechanism

1.1) Utilize AI algorithms and zero-knowledge (zk) verification to automatically validate data authenticity (e.g., cross-referencing remote sensing imagery with growth data reported by farmers).

1.2) Convert unstructured data (such as images of disease spots) into structured feature vectors based on ISO agricultural data standards.

2. Blockchain Notarization and Ownership Confirmation:

2.1) Hash values of raw data are recorded on-chain to ensure immutability.

2.2) On-chain data certificates are generated to clarify ownership, with traceable circulation records.

3. Tiered Data Authorization:

3.1) Public Data (e.g., general meteorological information): Freely accessible for foundational AI model training.

3.2) Private Data (e.g., individual farmer plot yields): Achieves "usable but invisible" through zero-knowledge proofs; enterprises must pay AESC to access desensitized analysis results.

3.3) Core Data (e.g., exclusive crop variety data): Usage scope defined by smart contracts, with revenue proportionally distributed to data contributors.

4.4 Data Service Product Matrix

Product Name	Target Customers	Service Content	Pricing Model
Agricultural Condition Monitoring API	Agricultural Input Companies, Government Agencies	Real-time soil and crop status data interface	Pay-per-call, $0.01 worth of $AESC per call
Yield Forecast Reports	Buyers, Insurance Companies	Multi-dimensional data-based crop yield predictions	One-time purchase, $10-$100 worth of $AESC per report
Data Asset Packages	AI Companies, Research Institutions	Anonymized and labeled pest/disease & crop variety datasets	Subscription-based, $500 worth of $AESC per month
RWA Data Support	Financial Institutions	Agricultural asset valuation, risk assessment data	Service fee, 0.5% of asset value payable in $AESC

4.5 Implementation Validation Cases

Case 1: Climate FieldView™ - Monsanto (now Bayer)

Product Positioning: An integrated, hardware and software combined precision agriculture digital platform designed to serve as the "digital hub" for farms.

Successful Practices:

Data Collection: Hardware devices installed on agricultural machinery automatically collect real-time data from various stages such as planting, fertilizing, pesticide application, and harvesting. This includes yield, moisture, and operational speed data. The system also integrates satellite imagery and field meteorological data.

Core Functions:

1) Data Visualization and Insights: Generates field-level yield maps, soil variability maps, and other visualizations on tablets or smartphones, enabling farmers to intuitively understand field variations.

2) Variable Rate Prescriptions: Creates Variable Rate (VR) prescription maps for seeding and fertilizing based on data analysis, guiding machinery for precision operations.

3) Field Health Monitoring: Utilizes satellite imagery to continuously monitor crop growth and promptly identify problem areas.

Success Evidence:

As of 2023, the platform was in use on over 180 million acres globally, making it one of the digital agriculture platforms with the largest market share in North America.

User Value: Numerous farmers reported that using FieldView for variable rate nitrogen application saved an average of approximately $15-30 per acre in fertilizer costs, while maintaining or even slightly increasing yields. The platform achieved commercial success through a subscription fee model (charged annually or per acre), demonstrating the compelling return on investment delivered by data-driven services.

Case 2: John Deere Operations Center

Product Positioning: A cloud-based farm management platform deeply integrated with top-tier agricultural machinery hardware.

Successful Practices:

Data Collection: The inherent advantage lies in the fact that all smart agricultural machinery (such as tractors and harvesters) under the John Deere brand can seamlessly sync data to the cloud platform during operation, enabling "plug-and-play" functionality.

Core Functions:

1) End-to-End Operation Monitoring: Remotely view the operating location, progress, fuel consumption, and operation quality of all agricultural machinery in real time.

2) Data Integration and Management: Not only manages agricultural machinery data, but also integrates soil sampling data, drone imagery, and other data sources to form unified digital farm records.

3) Cross-Team Collaboration: Farmers, farmworkers, and agronomists can jointly view data, develop plans, and assign tasks on the platform to improve management efficiency.

Success Evidence:

As the flagship digital product of the world's largest agricultural machinery manufacturer, its user base is directly tied to John Deere's sales of smart agricultural machinery, covering millions of large-scale farms across the globe.

User Value: A large family farm in the U.S. Midwest optimized the routes of its agricultural machinery fleet by using the Operations Center, which increased the efficiency of the autumn harvest by 20% and saved over $50,000 in fuel and labor costs within a single growing season. By enhancing customer stickiness and enabling premium pricing for high-end agricultural machinery, the platform has become one of John Deere's core competitive advantages.

Case 3: Taranis® - Smart Agricultural Reconnaissance Platform

Product Positioning: Leveraging AI recognition technology with "trinity" imagery (high-altitude, low-altitude, and ground-based) to provide precision early warning for pests, diseases, and weeds.

Successful Practices:

Data Collection: Combines high-resolution satellite imagery, fixed-wing aircraft aerial photography, and drone close-range photography to acquire field images with millimeter-level precision.

Core Functions:

1) AI Intelligent Recognition: Its core lies in computer vision algorithms, which can automatically identify the specific locations and severity levels of threats (such as pests, diseases, weeds, and nutrient deficiencies) from massive volumes of images.

2) Early Warning and Localization: Issues alerts to farmers in the early stages of problems (e.g., when pest infestations occur in scattered spots) and accurately marks the locations on a map.

3) Guidance for Precision Actions: Based on the early warning map, farmers can directly dispatch personnel to designated locations for targeted treatment, avoiding full-field pesticide spraying.

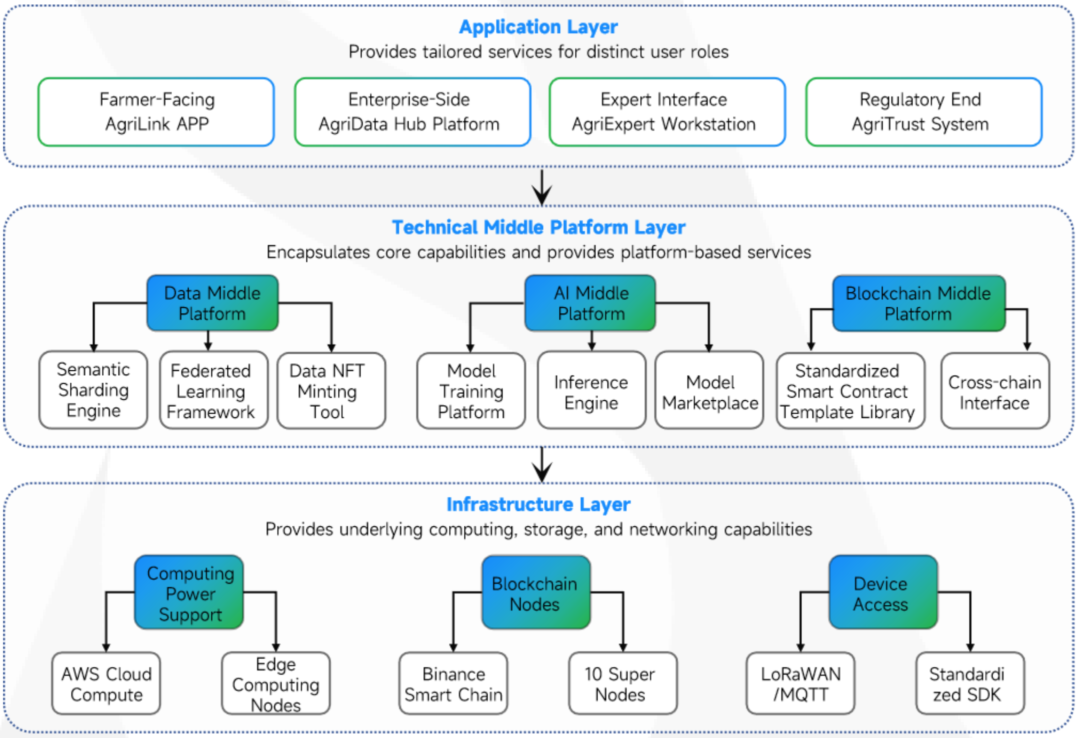
Success Evidence:

This service has been commercially deployed in major agricultural regions such as the United States, Brazil, Argentina, Russia, and Ukraine, covering a monitoring area of over 20 million acres.

User Value: After using Taranis, soybean growers in Brazil accurately detected bollworm outbreak spots in a field early in the season. Through early localized treatment, they successfully prevented the spread of the infestation, avoiding potential yield losses of hundreds of dollars per hectare—far exceeding the cost of the reconnaissance service.

5. Implementation Path for Building the Smart Agriculture Platform

5.1 Platform Architecture Design



5.1.1 Infrastructure Layer

Computing Support: A hybrid cloud architecture is adopted, utilizing AWS cloud computing resources for daily AI inference, while edge computing nodes process real-time IoT data (such as irrigation trigger commands).

Blockchain Nodes: Ten super nodes (including nodes for farmer cooperatives, research institutions, and enterprises) are established based on the Binance Smart Chain to ensure decentralized data storage.

Device Connectivity: Compatible with mainstream IoT protocols (LoRaWAN, MQTT), providing standardized SDKs to support third-party device integration.

5.1.2 Technical Middleware Layer

Data Middle Platform: Integrates a semantic sharding engine (improving data retrieval efficiency by 45%+), a federated learning framework (supporting collaborative training across 100+ nodes), and data NFT minting tools.

AI Middle Platform: Provides a model training platform, inference engine, and model marketplace (allowing third parties to upload agricultural AI models).

Blockchain Middle Platform: Includes a smart contract template library (for RWA issuance, knowledge payments, data authorization, etc.) and cross-chain interfaces (supporting interoperability with Ethereum and Polygon).

5.1.3 Application Layer

Farmer Client: "AgriLink" APP (Data Upload, Knowledge Acquisition, Service Booking)

Enterprise Client: "AgriData Hub" Platform (Data Procurement, RWA Issuance, Targeted Marketing)

Expert Client: "AgriExpert" Workstation (Content Creation, Online Diagnostics, Data Contribution)

Regulatory Client: "AgriTrust" System (Data Compliance Audits, Asset Traceability Verification)

5.2 Platform Implementation Steps

1) Pilot Deployment Phase (Months 1-3):

   1.1) Deploy core infrastructure in 2 representative production regions (focusing on tropical cash crops and temperate grain crops).

   1.2) Integrate 1000+ IoT devices; complete training and testing of core AI models (e.g., pest/disease identification, irrigation recommendation).

   1.3) Launch data collection and basic AI diagnostic features; onboard 500 farming households for internal testing.

2) Feature Enhancement Phase (Months 4-6):

   2.1) Iterate AI models to achieve ≥92% accuracy; launch yield prediction and market analysis modules.

   2.2) Build the data rights trading module and a basic version of the paid knowledge service system.

   2.3) Onboard 3 agricultural input suppliers and 2 financial institutions to pilot data services.

3) Global Expansion Phase (Months 7-12):

   3.1) Launch multilingual versions (supporting languages including English, Spanish, Japanese, Korean).

   3.2) Establish partnerships with 10+ agricultural cooperatives across different countries to expand device and user coverage.

   3.3) Launch DeFi lending products, issue RWA, and demonstrate RDA data value.

5.3 Technical Implementation Safeguards

Equipment Adaptation: Collaborate with enterprises to customize low-cost IoT devices; provide subsidies for "equipment + data packages".

Model Optimization: Utilize transfer learning to reduce training difficulties in small-sample scenarios; establish expert annotation channels for niche crops.

Network Support: Provide offline data caching functionality in areas with weak network coverage; enable automatic synchronization and upload to the blockchain once connectivity is restored.

6. AI Algorithm-Based Precision Push System Design

6.1 Core Push Logic

Driven by a three-dimensional model of "User Profile + Scenario Tags + Real-time Data," the system achieves "personalized service push" tailored to individual users.

The core formula is:

Push Priority = $\alpha \times$ User Demand Match Score + $\beta \times$ Scenario Urgency + $\gamma \times$ Content Value Score

(where α=0.4, β=0.3, γ=0.3, with dynamically adjustable weights)

6.2 User Profile Construction

6.2.1 Profile Dimensions and Tagging System

Profile Dimension	Core Tags	Data Source	Update Frequency
Identity Attributes	Farmer (Field/Protected), Agri-input Supplier, Buyer, Expert	DID Verification + Self-reporting	One-time (Updates require review)
Production Characteristics	Crop Type (e.g., Rice/Coffee/Cotton), Planting Scale, Growth Stage	Equipment Data + Manual Entry	Real-time (Growth stage updated weekly)
Demand Tags	Technical Consultation (Pest/Fertilization), Financing Needs, Market Access	Behavior Logs + Active Queries	Real-time
Preference Features	Content Type Preference (Video/Graphic), Payment Willingness, Interaction Frequency	Platform Behavior Data	Daily

6.2.2 Profile Privacy Protection

Utilizes Decentralized Identity (DID) to identify users, preventing real identity exposure.

Profile data is stored on the user's local node; the platform only accesses encrypted feature vectors, updating the recommendation model through federated learning.

6.3 Precision Push Algorithm Implementation

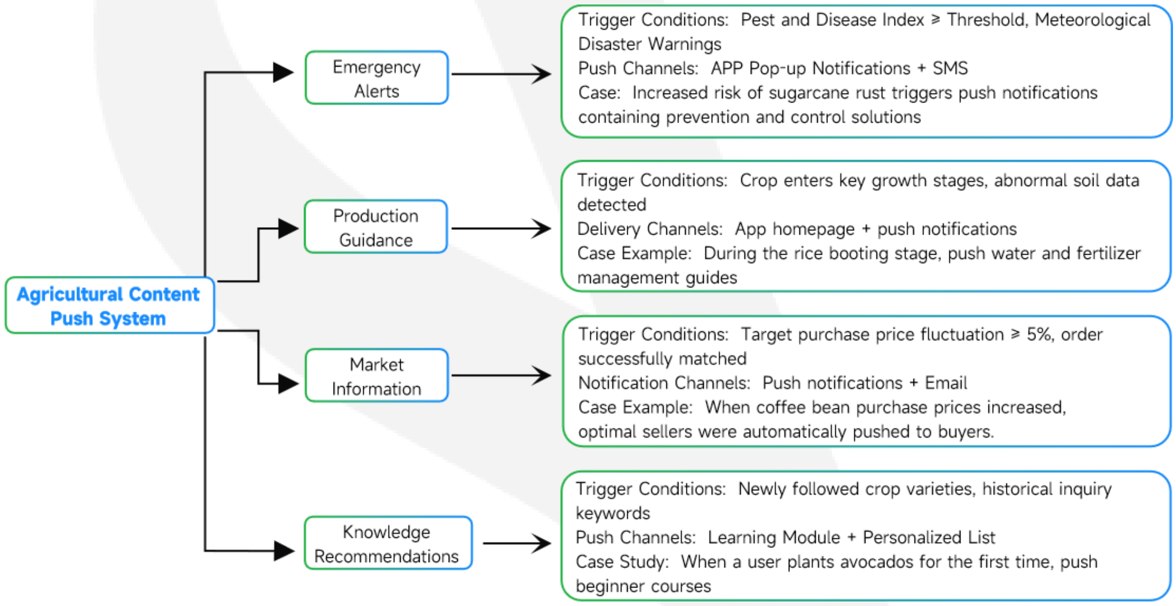
1) Algorithm Selection: Combines Collaborative Filtering (CF) and an Agriculture-oriented Temporal Awareness Model (ATAM) to address the "cold start" and "scenario adaptation" problems:

Collaborative Filtering (CF): Recommends content based on the needs of similar users (e.g., suggesting pest control solutions that farmers growing the same crops are focusing on).

ATAM: Pushes content based on sequential information like crop growth cycles and meteorological data (e.g., pushing content on lodging prevention during the jointing stage).

2) Push Content Categories and Trigger Conditions:

Content Type	Trigger Conditions	Push Channels	Examples
Emergency Alerts	Pest and Disease Index ≥ threshold, Weather Disaster Warnings	APP Pop-ups + SMS	Risk of Sugarcane Rust increasing, pushing prevention and control plans
Production Guidance	Crops entering critical growth stages, Abnormal Soil Data	APP Homepage + Message Notifications	Rice booting stage, pushing water and fertilizer management guidelines
Market Information	Target Purchase Price fluctuation ≥ 5%, Successful Order Matching	Push Bar + Emails	Coffee Bean Purchase Price rising, pushing optimal sellers
Knowledge Recommendations	Newly Followed Crop Varieties, Historical Consultation Keywords	Learning Section + Personalized Lists	First-time avocado cultivation, pushing introductory courses



6.4 Push Effectiveness Optimization Mechanism

A/B Testing: Each month, 10% of farmer users are selected for testing. Group A receives a "Sugarcane Rust Alert" push notification at 8:00 AM, while Group B receives the same alert plus a prevention rhyme at 12:00 PM. If Group B's open rate is 30% higher, the "Noon + Rhyme" strategy is rolled out to all users, and the parameter weights for "push timing" and "copy style" within the algorithm are optimized.

Feedback Loop: When an enterprise user marks a "Coffee Bean Purchase Price Fluctuation" push as "useless," this feedback accounts for 40% of the content's value score. For example, if the original score was 60, it drops to 20 after feedback. Subsequently, similar low-value information will not be pushed to comparable enterprises.

Frequency Control: Farmer A frequently clicks on production guidance pushes, but based on platform rules, they receive a maximum of 5 pushes per day (e.g., 1 alert, 2 water/fertilizer guides, 1 market price update, 1 course recommendation). Enterprise Jia has lower interaction rates, so their daily push limit is set to 3 (e.g., 1 order notification, 1 industry report, 1 partnership opportunity) to avoid excessive disturbance.

7. Implementation Plan for Agricultural Knowledge Monetization

7.1 Knowledge Content System Construction

7.1.1 Content Tiering and Core Modules

Content Tier	Core Module	Content Format	Creator	Price Range (AESC)
Basic Tier (Free)	General Planting Guides, Policy Interpretations, Market Updates	Image + Text, Short Videos	Platform Editors + AI Generated	0
Professional (Paid)	In-depth Pest and Disease Diagnosis, Crop Variety Improvement Solutions, Precision Fertilization Models	Live Broadcast Column, Toolkit	Agricultural Experts, Research Institutions	$5-50 worth of AESC
Custom Edition (Premium)	Parcel-Specific Planting Plan, RWA Asset Valuation Report, Supply Chain Optimization	One-on-One Consultation, Custom Reports	Industry Experts, Third-Party Institutions	$100-10,000 worth of AESC

7.1.2 Content Quality Control

Access Mechanism: Experts must pass DID verification + qualification review (e.g., agricultural technology extension certificates, proof of research achievements).

Review Process: A three-tiered process of "AI preliminary screening + expert committee review + community voting" is adopted. AI checks content for duplication rate and accuracy, while the expert committee handles professional disputes.

Update Mechanism: Professional content is updated quarterly, while customized content is adjusted dynamically according to agreed cycles (e.g., the planting season).

7.2 Monetization Model Design

7.2.1 Core Payment Methods

1) Subscription System:

Farmer Package: $99 worth of AESC per quarter, includes 10 professional diagnostics + 3 specialized courses + real-time alerts.

Enterprise Package: $999 worth of $AESC per quarter, includes 50 data API calls + 10 industry reports + priority access to expert consultations.

2) One-Time Payment:

Single Article/Report: $5-50 worth of AESC.

Single Diagnostic Service: $20-100 worth of AESC.

Live Stream Replay: $15-30 worth of AESC.

3) Knowledge On-Chaining:

Limited Edition Expert Courses: Experts set their own prices on-chain. Users can pay AESC to obtain short-term or permanent learning access. Holders enjoy permanent learning rights + qualification for expert communication.

Knowledge Creation: Agricultural practitioners upload original solutions to the chain. Any enterprise or individual can pay AESC to obtain learning access. The revenue rights from payments belong to the creator, with the platform charging a 15% service fee.

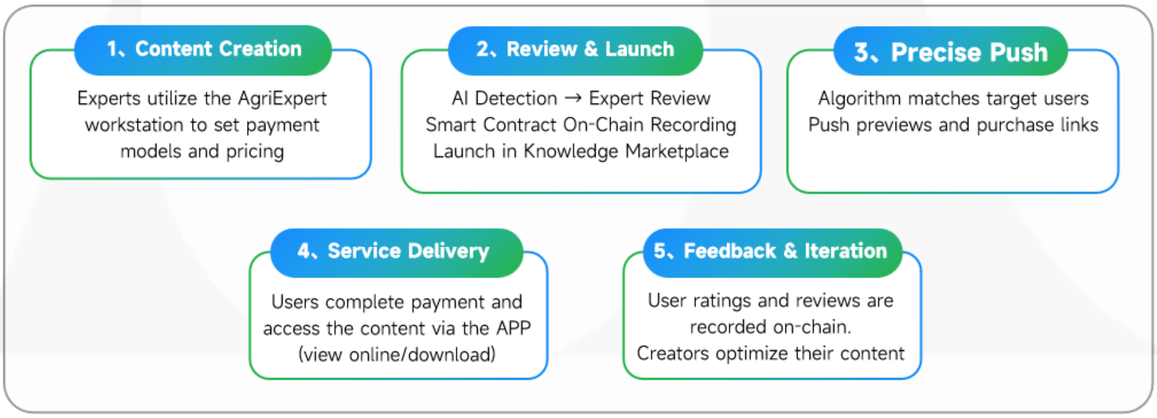
7.2.2 Payment and Settlement

Payment Method: Only $AESC token payments are supported, with fund transfers automatically executed via smart contracts.

Settlement Cycle: Earnings for expert creators are settled in real-time, while institutional partnership revenues are settled monthly.

Revenue Share: The platform charges a 15% service fee, with the remaining 85% distributed to content creators (including expert teams and data providers).

7.3 Operational Implementation Process



1. Content Creation: A fruit cultivation expert uses the "AgriExpert" workstation to upload the "Durian Pest and Disease Control Guide." They select the "one-time purchase" payment model, set the price at $19 per copy, and note that the content includes 3 practical videos and 1 printable management chart.

2. Review and Publication: AI first checks the content for potential copyright infringement and errors in the control methods. After confirmation, it's submitted to the expert committee. Subsequently, the content information is written into a smart contract for on-chain notarization and finally published on the platform's "Knowledge Marketplace."

3. Precision Push: Based on user tags (e.g., crop type: Durian, region: Thailand, browsing history: repeatedly viewed durian planting content), the algorithm pushes a preview of the guide to farmers in Thailand, along with a purchase link within the APP.

4. Consumption and Delivery: The farmer clicks the link and pays the equivalent of $19 using AESC tokens from their account (automatic conversion). After payment, the APP redirects to the content page, supporting online video viewing and PDF guide download (once downloaded, it's permanently saved in "My Resources" for offline access).

5. Feedback and Iteration: After using the guide, the farmer gives a 4-star rating and comments "Hope to add more practical durian cases." This rating and comment are synchronized on-chain. The expert sees the feedback in the "Creator Backend" and updates the guide one month later, adding pest control regulation cases for local Thai durians. The platform notifies users who purchased the guide that "the content has been updated, and the new sections can be viewed for free."

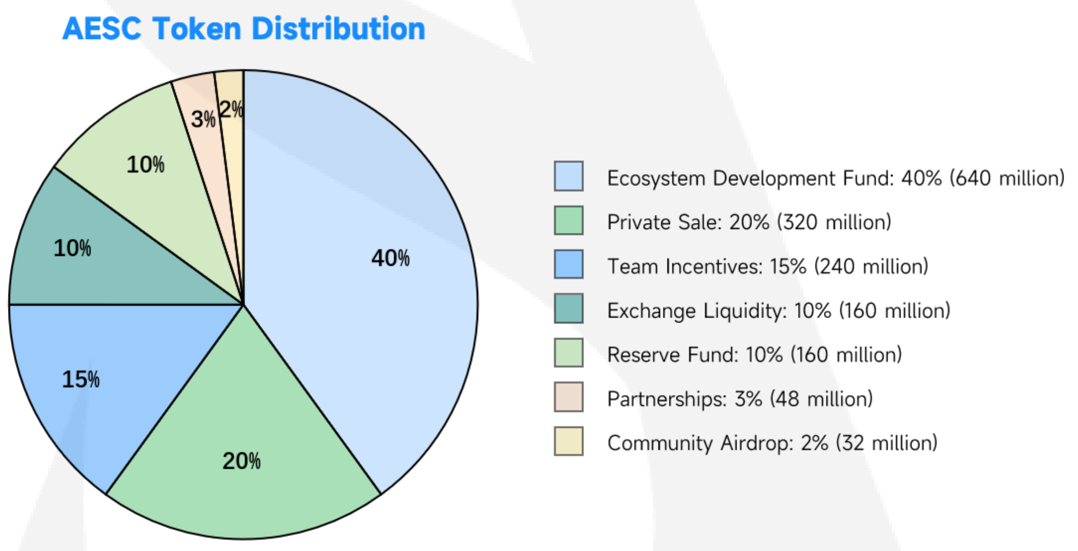
8. AESC Token Economic Model

8.1 Core Token Parameters

Item	Content	Description
Token Name	AESC	The only token with utility value on the plat- form ecosystem
Total Supply	1.6 billion coins	Permanently fixed quantity
Underlying Public Chain	Binance Smart Chain (BSC)	EVM Compatible, reducing develop- ment and migration costs
Token Standard	BEP-20	Supports access to mainstream wal- lets and exchanges
Decimal	16	Meets the needs of microtransactions

8.2 Token Distribution Plan

Allocation Purpose	Percentage	Quantity (100 million coins)	Unlocking Mechanism
Private Placement	20%	3.2	10% unlocked upon launch, the remaining unlocked linearly over 12 months
Ecosystem Development Fund	40%	6.4	1/40 unlocked monthly, fully unlocked over 40 months
Team Incentives	15%	2.4	10% unlocked upon launch, the remaining unlocked linearly over 18 months
Exchanges	10%	1.6	50% unlocked upon launch, the remaining unlocked linearly over 12 months
Community Airdrop	2%	0.32	After task completion, released linearly over 6 months
Reserve Fund	10%	1.6	Unlocking amount determined by community voting, used for risk response and emergency subsidies
Partners	3%	0.48	Unlocked based on cooperation progress, maximum 12 months



8.3 Deflationary Mechanism

Fee Burn: 20% of all platform service fees (including knowledge payments, data services, and DeFi transactions) will be used to buy back and burn AESC tokens until the total supply is reduced to 1 billion.

Buyback and Burn: 30% of the ecosystem's quarterly revenue will be used to repurchase and burn AESC, with the burn records publicly disclosed.

8.4 User incentives Mechanism

The plarform fees (e.g. service fees, revenue) would be allocated to incentivise active users which utilise the platform services or contribute to activities/ fees (including data contribution, content creation, and community promotion).

8.5 Token Application Scenarios

1) Payment for Basic Services: As the native platform currency, $AESC is utilised for payments for knowledge, data API calls, AI diagnostic services etc.

2) DeFi Ecosystem: User may stake $AESC to participate in the DeFi ecosystem thereon, i.e. peer-to-peer loans, swaps and earn $AESC rewards for their engagement; users may stake agricultural RWA assets (e.g., Land NFTs, crop profit rights) to borrow $AESC; users may utilise $AESC as the medium of exchange to participate in purchasing and claiming settlements for agricultural insurance tokens (e.g., drought insurance, yield insurance).

3) NFT: Users holding $AESC can participate in the minting of any NFT collections.

4) GameFi: Users can use AESC to participate in chain games and earn rewards, combining entertainment with digital asset utility.

5) Web3: Enterprises and individuals can use Web3 data distribution platforms to browse desired data elements and pay varying amounts of $AESC as fees.

6) RWA Transactions: $AESC serves as a neutral medium of exchange for the pricing and anchoring tool for the tokenization of agricultural assets.

7) Governance Rights: Users may stake $AESC to obtain voting rights and participate in decisions regarding the platform, e.g. protocol rule amendments, and usage of reserves/ fund to build out and promote the ecosystem.

8) Incentive Credentials: The platform fees (e.g. service fees, revenue) would be allocated to incentivise active users which utilise the platform services or contribute to activities/ fees (including data contribution, content creation, and community promotion).

9. Business Model and Economics

9.1 Core Objectives

1) Short-term (1-2 years): Achieve 200,000+ active farmer users, integrate 50,000+ IoT devices, and reach a 40% AESC ecosystem circulation rate.

2) Medium-term (3-5 years): Expand coverage to agricultural production areas in 30+ countries, scale agricultural RWA assets to over $1 billion, and become a globally leading agricultural data service platform.

3) Long-term: Build a decentralized agricultural ecosystem via the Agri-Eco Smart Chain, realizing the assetization of agricultural data, the intellectualization of services, and the fair distribution of value.

9.2 Business Model Operational Process

Phase	Core Link	Specific Activities
A	User Access	Farmers/Cooperatives: Equipment Deployment + Data Upload
		Enterprises/Institutions: Qualification Review + Service Subscription
		Experts/Creators: Identity Verification + Content Upload
B	Value Creation	AI Services: Diagnosis / Prediction / Push Notifications
		Data Services: API / Reports / Asset Valuation
		Knowledge Services: Courses / Consultation / Toolkits
		Financial Services: RWA Issuance / DeFi Lending / Insurance
C	Value Circulation	Users Pay AESC to Access Services
		Platform Collects Service Fees
		Creators/Data Contributors Receive AESC Rewards
		Partial AESC Destruction / Buyback to Enhance Value
D	Ecological Closed Loop	Increased User Benefits → More Data Contributions
		Improved Content Quality → Increased User Willingness to Pay
		Increased Asset Liquidity → More Financial Institutions Onboard

9.3 Revenue Stream Matrix

Revenue Type	Specific Methods	Profit Margin	Expected Contribution Ratio
Knowledge Payment Service Fees	15% share of content sales revenue	80%+	35%
Data Service Fees	API call fees, data asset package subscription fees, RDA, WEB3 application distribution	90%+	30%
DeFi Service Fees	10% of lending interest5% of transaction fees	75%+	20%
RWA Service Fees	Asset issuance fee (1%)Valuation service fee (0.5%)	85%+	10%
Advertising & Cooperation	Equipment sales commissions Targeted marketing fees for agricultural input enterprises	60%+	5%

9.4 Utility Value

1) Token Utility Value: As the ecosystem's user base and asset scale expand, driving increased demand for AESC including its native token $AESC.

2) Ecosystem Revenue Sharing: 20% of the platform's total revenue is allocated for technology research and development and market expansion.

3) Data Asset Accumulation & Value Proposition: Agricultural data assets accumulated through long-term operation, after ownership confirmation, are supplied to the Web3 data distribution platform. Various enterprises and practitioners can pay $AESC to access this data, with proceeds distributed to data producers and related enterprises.

4) Public Chain Value Proposition: Upon future upgrade to the Agri-Eco Smart Chain, the platform, as an initial node, will participate in block reward distribution.

10. Risk Control and Key Success Factors

10.1 Core Risks and Countermeasures

Risk Type	Specific Risk Points	Response Measures
Policy Risks	Tightened cryptocurrency Regulation Agricultural data cross-border restrictions RWA compliance disputes	1) Establish a global compliance team and set up operation centers; 2) Comply with regulations such as GDPR for cross-border data transmission; 3) Adopt the "Profit Right Token" model for RWA issuance, without involving the transfer of asset ownership.
Technical Risks	Smart contract vulnerabilities Insufficient accuracy of AI Models Data leakage	1) Invite auditing institutions to conduct contract audits and set up a security bounty program; 2) Establish a model iteration mechanism and cooperate with research institutions to optimize algorithms; 3) Adopt zero-knowledge proof and end-to-end encryption to protect data privacy.
Market Risks	Low acceptance among Farmers Token price Fluctuations Competitor competition	1) Cooperate with farms for promotion and launch pilot programs with "subsidies + income guarantees"; 2) Establish a market value maintenance fund and stabilize prices through liquidity mining; 3) Focus on the differentiated advantage of data assetization to avoid homogeneous competition.
Operational Risks	Decline in content quality Difficulties in equipment Maintenance Insufficient expert resources	1) Establish a content rating and elimination mechanism and introduce community review; 2) Cooperate with local enterprises to set up equipment service stations and provide on-site maintenance; 3) Sign cooperation agreements with agricultural colleges and universities to build an expert resource pool.

10.2 Key Success Factors

1) Technology Implementation Capability: Transform blockchain and AI technologies into tangible value perceived by farmers (e.g., cost reduction, yield increase), avoiding technology operating in a vacuum.

2) Ecological Synergy Effect: Achieve mutual benefits for farmers, enterprises, financial institutions, and experts, forming a virtuous cycle of "data contribution → service enhancement → value added".

3) Compliance-First Strategy: Design products, especially RWA and token mechanisms, within regulatory frameworks to ensure long-term operational legitimacy.

4) Localization Adaptation Capability: Customize solutions based on the agricultural characteristics, technological levels, and policy environments of different countries.

5) Community Governance Vitality: Build active user and developer communities through AESC incentives to achieve ecological self-iteration and optimization.

11. Future Public Chain: Agri-Eco Smart Chain Planning

11.1 Core Positioning of the Public Chain

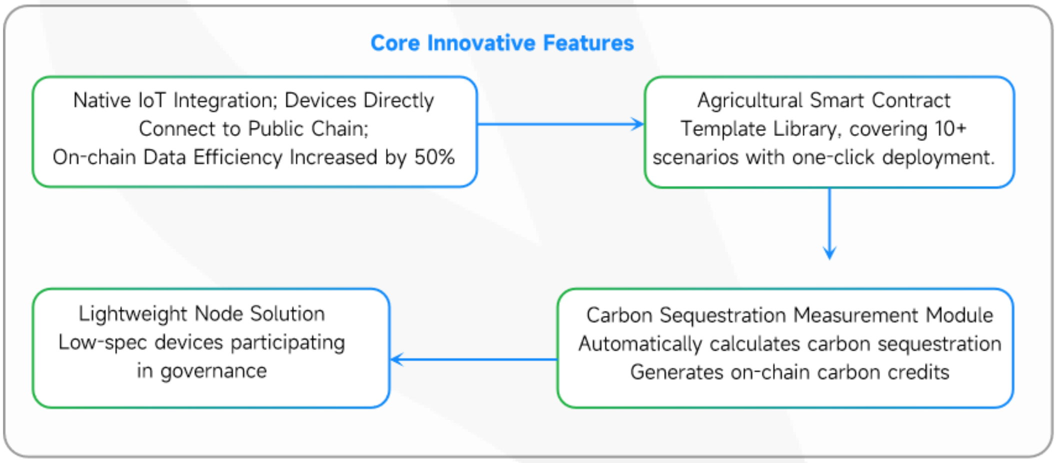
Aiming to address the performance bottlenecks of existing public chains in agricultural scenarios (e.g., latency in high-frequency IoT data uploads, difficulty in customizing agricultural smart contracts), this initiative will build a "dedicated high-performance public chain for agriculture." It aims to achieve full-stack decentralization of "Data - Assets - Services - Governance," positioning itself as the foundational infrastructure for the global agricultural Web3 ecosystem.

11.2 Public Chain Technical Architecture

11.2.1 Core Technical Features

Technical Module	Design Scheme	Performance Indicators
Consensus Mechanism	Hybrid consensus of Proof of Stake (PoS) + Proof of Authority (PoA)	TPS ≥ 100,000+, Confirmation Time < 3 Seconds
Network Architecture	Agriculture-Specific Sharding (Divided into 6 shards by crop type/region)	Inter-shard Data Synchronization Delay < 1 Second
Smart Contracts	Supports AgriVM Virtual Machine Compatible with Solidity + Agriculture-Specific Instruction Set	Smart Contract Execution Cost Reduced by 40%
Storage Optimization	Hot-Cold Data Separation Hot Data Stored On-Chain, Cold Data Stored on IPFS	Single-Node Storage Cost Reduced by 70%
Cross-Chain Protocol	Natively Supports Cross-Chain Interoperability with BSC, Ethereum, and Polygon	Cross-Chain Transaction Success Rate ≥ 99.9%

11.2.2 Core Innovative Features



1) IoT-Native Integration: Built-in IoT device authentication protocols support direct device connection to public chain nodes, improving on-chain data efficiency by 50%.

2) Agricultural Smart Contract Template Library: Covers 10+ scenarios including RWA issuance, crop insurance, and traceability, enabling developers to deploy with one click.

3) Carbon Sink Accounting Module: Automatically calculates the carbon sink volume from agricultural activities, generates on-chain carbon credit certificates, and connects to carbon trading markets.

4) Lightweight Node Solution: A lightweight node client optimized for farmer terminals, supporting participation in on-chain governance even on low-configuration devices.

11.3 Public Chain Ecosystem Development Roadmap

1) Technology R&D Phase (12-18 Months):

Complete core public chain code development and testnet deployment.

Launch developer toolkit (SDK, testnet, block explorer).

Establish a $100 million Agri-Eco Grant fund to support agricultural Web3 projects.

2) Ecosystem Migration Phase (19-24 Months):

Achieve seamless migration from the BSC ecosystem to the Agri-Eco Smart Chain (including cross- chain asset transfer and data migration).

Incubate 5 core ecosystem projects (e.g., decentralized agricultural insurance, RWA trading platform, carbon credit exchange).

Reach public chain cooperation intentions with agricultural institutions in 10+ countries.

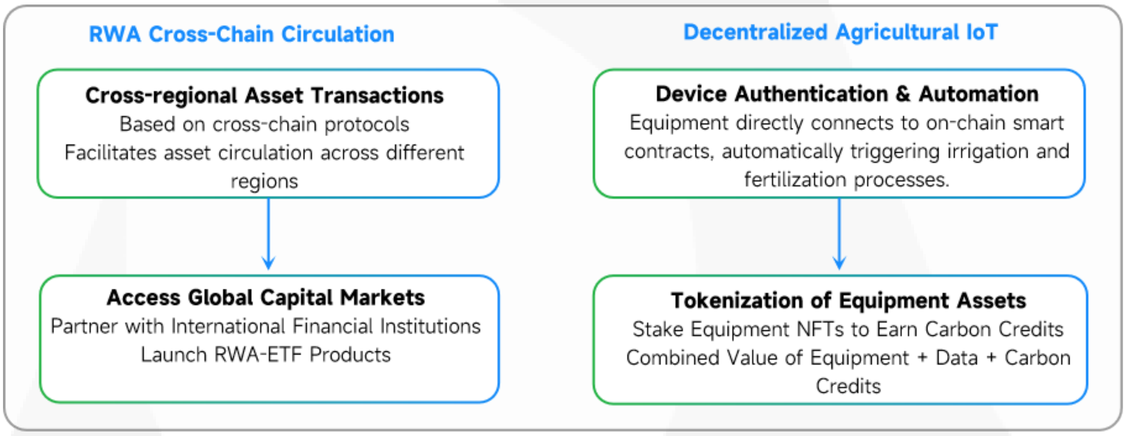
3) Ecosystem Prosperity Phase (25-36 Months):

Expand the number of public chain nodes to over 1,000, with more than 100 ecosystem projects.

Grow agricultural RWA asset scale to exceed $5 billion and carbon credit trading volume to surpass $1 billion.

Promote the establishment of international standards for Agricultural Web3, positioning the chain as a global benchmark for agricultural public chains.

11.4 Core Public Chain Application Scenarios



11.4.1 Distributed Agricultural IoT

1. After devices pass public chain identity authentication, they automatically form networks. Data is recorded on-chain via smart contracts, triggering automated operations such as irrigation and fertilization.

2. Device assets are tokenized, allowing farmers to stake device NFTs to obtain carbon credits, achieving value stacking of "equipment + data + carbon sink".

11.4.2 RWA Cross-Chain Circulation

1. Utilizing the public chain's cross-chain protocol to enable cross-regional trading of agricultural assets from different areas.

2. Collaborating with international financial institutions to launch ETF products based on Agri-Eco Smart Chain RWAs, accessing capital markets.

12. Development Roadmap

Phase	Time	Core Tasks	Key Milestones
Construction Phase	Months 1-3	Complete team formation Technical architecture design & whitepaper release	Reach pilot cooperation intentions with 2 agricultural production areas
Launch Phase	Months 4-6	Launch AESC airdrop and private placement	150,000 global active users participate in the airdrop and private placement
Pilot Phase	Months 7-9	Deploy basic platform, connect IoT devices, test AI models	500 farmers participate in internal testing AI diagnosis accuracy ≥ 85%
Expansion Phase	Months 10-18	Launch DeFi lending products / RWA issuance	Cover 5 countries RWA asset scale reaches USD 500 million
Public Chain R&D Phase	Months 19-24	Deploy Agri-Eco Smart Chain testnet, build developer ecosystem	Fund 30 ecosystem projects
Public Chain Launch Phase	Months 25-30	Launch public chain mainnet, migrate ecosystem, start carbon sink module	Reach 100 public chain nodes Carbon sink transactions exceed USD 100 million
Ecosystem Maturity Phase	Months 31-36	Formulate global standards, deepen international cooperation, achieve ecosystem prosperity	Over 100 ecosystem projects AESC market capitalization ranks among top 50 in the industry

13. Conclusion

The AI-powered smart agriculture service platform developed by the Bluepine Tech Foundation addresses the core pain points of traditional agriculture—insufficient data credibility, inefficient service delivery, and poor asset liquidity—through the integrated application of "blockchain + AI + Web3" technologies. Starting with practical agricultural data services, the platform achieves tangible service implementation via precision AI push notifications and a standardized paid knowledge system.

It builds a sustainable economic ecosystem anchored by the AESC token and ultimately realizes decentralized innovation across the entire agricultural value chain through the dedicated Agri-Eco Smart Chain public blockchain.

This solution has been validated through multiple pilot projects, demonstrating that its technical pathway and business model align with the global demand for agricultural digital transformation. We are confident that as the platform is promoted and the public blockchain becomes operational, it will effectively empower smallholder farmers and agricultural enterprises worldwide, driving the industry toward greater intelligence, efficiency, and sustainability, thereby contributing technological strength to global food security and rural revitalization.

Appendix: Key Terminology

AESC: The platform's ecosystem token, used for payments, incentives, and governance.

Semantic Blockchain: A blockchain technology that converts data into semantic feature vectors for storage and retrieval, enhancing data processing efficiency.

Agricultural RWA: Digital assets representing the tokenization of agricultural assets such as farmland, crops, and profit rights.

Federated Learning: A privacy-preserving computation technique that enables multiple nodes to collaboratively train an AI model without sharing raw data.

Agri-Eco Smart Chain: A high-performance public blockchain specifically designed for agricultural scenarios, supporting IoT integration and agriculture-specific smart contracts.