**Project Title:** Development of authentic veterinary vaccine delivery model in Kenya for improved livestock productivity

**Annual Report Period Covered:** Oct 2020 to Sept 2021

**KCSAP livestock Applied**

| Value chain: Dairy, Poultry | Duration: 18 Months | Start Date: Oct 2020 |

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**Background**
The livestock industry faces challenges among them, high prevalence of diseases that lead to trade restrictions and lowered productivity of the different livestock value chains. Vaccines are the best option in disease control and for the environment. Challenges in vaccine delivery limit access and usage with vaccine coverage of below 30 percent. Poor vaccine quality and potency at point of use are critical factors affecting adoption. The proposed project will increase access and usage of quality vaccines through development and utilization of a mobile application that will enhance vaccine traceability along the supply chain.

**Objectives**
1. Develop good livestock vaccine distribution practice including traceability from point of manufacture to end-user specifically for Foot and mouth and Newcastle disease vaccines
2. Increasing usage of quality vaccines for disease control in livestock

**Expected Outputs**
1. Traceability and quality assurance in vaccine delivery increased
2. Enhanced use of quality livestock vaccines in disease control

**I ACHIEVEMENTS**

**Objective 1:** Develop good livestock vaccine distribution practice including traceability from point of manufacture to end-user specifically for Foot and mouth and Newcastle disease vaccines

**Activity 1.1** Inception workshop with stakeholders,

**Achievement 1.1**
- The project held successful inception workshops in both Nyandarua and Uasin Gishu counties to sensitize stakeholders on the project activities. Comprehensive discussions related to livestock vaccine manufacture, supply and delivery to end users and mapping of key players/actors along the vaccine supply chain was conducted.
- Challenges and possible solutions/interventions at each supply chain segment were identified, discussed and recorded
• Study sites were selected based on the livestock population and existence of cooperatives for dairy cattle and chicken production under the Kenya Climate Smart Agricultural Productivity Project.

Activity 1.2: Audit of existing vaccine delivery system

Achievement 1.2
Engagement with players in the vaccine delivery chain revealed that:
• Both counties have a rich presence of animal health service providers including distributors, suppliers and retailers for both vaccines of interest, and that 75% of farmers used vaccines.
• While end users could easily access Newcastle disease (ND) vaccine over the counter, foot and mouth disease (FMD) was controlled and only available from the County Director of Veterinary Services (CDVS) for distribution within the county.
• While counterfeit vaccines are a major challenge, there was no attempt to authenticate vaccines along the distribution chain. Malpractices such as reconstitution of ND vaccine, freezing of reconstituted vaccines and dispensing small doses contrary to standard protocols was common among retail outlets.
• Animal health service providers in retail outlets indicated that compliance with cold-chain requirements along the supply chain was questionable without a system to monitor adherence.
• There was no evidence of follow-up on vaccine efficacy to resolve existing perceptions of vaccine failure.

Activity 1.3: Develop vaccine traceability indicators (Barcode, scan QR codes, colour sensitive strip)

Achievement 1.3
The processes for vaccine authenticity was discussed with stakeholders including the CDVS, public/private livestock service providers, staff from KEVEVAPI a public vaccine production entity and INOVA a private vaccine manufacturer. Indicators of interest were the Barcode/Scan QR and the flow of SMS alerts. It was agreed that a combination of traceability indicators would work better than any single indicator. The following additional indicators were agreed upon.
✓ Temperature monitors/loggers for vaccines during transit or in cold storage at point of manufacture and agrovets
✓ An irreversible pH indicator that will change colour in case of poor handling
✓ SMS alerts to include a vaccination calendar
✓ Routine vaccine viability test for manufacturers/distributors
✓ Pre- and post- serology sample collection and analysis for vaccine efficacy

Activity 1.4: Develop and testing mobile application for vaccine traceability to host verification indicators

Achievement 1.4: The project team held an in-house meeting with the ICT programmer from KALRO HQ where a draft Mobile Application process flow was developed. The process would among others ensure authenticity of the vaccine (ND and FMD) from the Manufacturer to the point
of use. VACCINE EXPAT APP has since been developed and is in advanced stages towards pretesting.

**Objective 2:** Increasing usage of quality vaccines for disease control in livestock

**Activity 2.1:** Stakeholder sensitization at County level

**Achievement 2.1:** This was achieved alongside 1.1 above. Stakeholders included CDVS, public and private animal health practitioners, manufacturers and distributors of vaccines.

**Activity 2.2:** Develop tools for data collection on animal health management practices

**Achievement 2.2**
- A checklist was developed in consultation with stakeholders among them the County Director of Veterinary services, public/private animal health service providers and private representatives from dairy cooperatives.
- Semi-structured questionnaires were developed from the checklist and mobile technology was used to capture and transmit data using the Open Data Kit (ODK) application.
- A pilot data collection exercise was conducted in Uasin Gishu County, to assess questionnaire content, flow of questions, data capture and transmission before rolling out the exercise. Lessons learnt provided crucial inputs into finalizing the questionnaires.

**Activity 2.3:** Data collection and analysis to identify gaps and best practices

**Achievement 2.3**
- Twenty (20) enumerators were recruited from each county with the assistance of KCSAP project officials and trained in the use of the ODK application and general data collection ethics.
- Face-to-face interviews were conducted and respondents included vaccine manufacturers, distributors, retailers/Animal Health Service Providers and end-users.
- Key informant interviews (KIIs) were conducted to obtain findings on pertinent issues with respondents drawn from County livestock staff (Director of Livestock production, Director veterinary services or their representatives and subject matter specialist), vaccine supply chain players and private extension agents.
- Quantitative data was analyzed using Stata 15.0 to generate descriptive statistics presented in frequency tables, charts, and percentages.
- Qualitative data generated through KII were analyzed using thematic analysis and reported in direct quotes.

**Activity 2.4:** Promote delivery and use of quality vaccine using mobile application developed in output 1.

**Achievement 2.4**

ND

**Summary of achievements under objective 2**
Activities 2.1-2.3 achieved as stated above. Only activity 2.4 is pending and will be achieved after operationalization of the mobile app under development.

II Other achievements
Q1 and Q2 technical reports were submitted

**III  Constraints and how they were overcome**
It was observed that the lockdown following Covid-19 led to a slowdown in vaccine production due to low demand associated with poor economic growth. We hope that this won’t significantly affect the pretesting of developed mobile application.

**IV  Summary of funds received, accounted for and balance**

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<tr>
<th>Project Amount (KES)</th>
<th>Amount Received (KES)</th>
<th>Amount accounted for (KES)</th>
<th>Balance (KES)</th>
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<td>2,652.55</td>
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</tbody>
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**IV  Way Forward**
Activities Planned for the Period Oct 2021-June 2022
- Pretest VACCINE EXPAT mobile app with team
- Pretest same app with stakeholders