



Food and Agriculture  
Organization of the United  
Nations

## Office of Evaluation

### **Mid-Term Evaluation of “Development of a Framework for the Progressive Control of Foot-and-Mouth Disease in Pakistan – GCP /PAK/123/USA”**

#### ***Evaluation Report***

December 2014

# Food and Agriculture Organization of the United Nations

## Office of Evaluation (OED)

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For further information on this report, please contact:

Director, OED  
Viale delle Terme di Caracalla 1, 00153  
Rome, Italy  
Email: [evaluation@fao.org](mailto:evaluation@fao.org)

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**Composition of the Evaluation Team****Evaluation team**

David Hadrill	Team Leader
Sajjad Zaheer	National Consultant

**FAO Office of Evaluation**

Omar Awabdeh,	Evaluation Manager
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**Acronyms**

ADC	Animal Disease Center
AGAH	Animal Health Division
AJK	Azad, Jammu and Kashmir
APRC	FAO Regional Conference for Asia and the Pacific
CPF	FAO Country Programming Framework
CSO	Civil Society Organization
DG	Director General
DRR	disaster risk reduction
ECTAD	Emergency Centre for Transboundary Diseases
ELISA	enzyme-linked immunosorbent assay
FAS	Foreign Agriculture Service
FATA	Federally Administered Tribal Areas
FAZD	Foreign Animal and Zoonotic Disease Defense
FMD	foot-and-mouth disease
GF-TADs	Global Framework for Progressive Control of Transboundary Animal Diseases
GoP	Government of the Islamic Republic of Pakistan
HRBA	Human Rights-Based Approach
KPK	Khyber Pakhtunkhwa
L&DD Dept	Livestock and Dairy Development Department
LTO	Lead Technical Officer
LTU	Lead Technical Unit
MoNFS&R	Ministry of National Food Security and Research
MTE	mid-term evaluation/review
NARC	National Agricultural Research Centre
NSP	non-structural protein
NUST	National University of Sciences and Technology
NVL	National Veterinary Laboratory
OIE	World Organisation for Animal Health
OP-I	the first One UN Program in Pakistan
PCP	progressive control pathway
PCR	polymerase chain reaction
PD50	50% protective dose (for FMD vaccine potency testing)
PKR	Pakistan Rupee
PTF	Project Task Force
PWB	Programme of Work and Budget
RAP	Regional Office for Asia and the Pacific
RBM	results-based management
SO	Strategic Objective
SOP	standard operating procedures
SP	structural protein (of FMD virus particle)
TAD	transboundary animal disease
TAMU	Texas A&M University (formerly Agricultural and Mechanical)
TNA	training needs analysis
ToR	terms of reference
TWG	Technical Working Group
UN	United Nations
UNCT	UN Country Team

UNCU	UN Understanding on a HRBA
UNDAF	United Nations Development Assistance Framework
USD	United States dollar
USDA	United States Department of Agriculture
WRL	World Reference Laboratory

## Executive Summary

ES1. This report presents the findings of the mid-term evaluation (MTE) of GCP/PAK/123/USA titled “*Development of a framework for the progressive control of foot-and-mouth disease in Pakistan*”. The MTE’s purpose is to inform key stakeholders about the project’s progress and performance towards attaining expected outputs and outcomes. The MTE was carried out from August to October 2014 with field work in Pakistan from 18 August to 03 September 2014.

ES2. At country level the project addresses the problem of endemic foot-and-mouth disease, a highly infectious livestock disease that is a global concern. The project is integrated with the regional/ global initiative to control the disease, that is, the progressive control pathway (PCP). The project builds on earlier aid initiatives, especially the FAO regional project *GTFS/INT/907/ITA – Controlling Transboundary Animal Diseases in Central Asia*, which ended in 2012.

ES3. The project is well designed with clear, logical linkages between Activities, Outputs, Outcome and Impact. However, the logical framework presented in the Project Document has gaps and does not facilitate comprehensive results-based management (RBM). The designed approach and methodology are adequate to achieve intended outcomes. Total financial resources were adequate, but a time extension has proved necessary to implement and disburse the budget. The planned three years duration has been extended to a fourth year. A major budget revision was required, mainly to transfer funds to enable sufficient vaccine purchase.

ES4. Project management to date is excellent. The national incumbent Project Coordinator performs extremely well. The Government of the Islamic Republic of Pakistan (GoP) is actively involved with project management and decision-making both at Federal and Provincial/ Regional levels.

ES5. The institutional oversight of the project is working well. A Technical Working Group (TWG) and Steering Committee are functional and have broad, tripartite (Government, FAO, donor) representation. Work plans are discussed and approved. Almost all planned activities have been undertaken although a year of implementation remains. Where activities have not been carried out, this tends to be for reasons not under project management’s direct control. For example, support to a central epidemiology unit is delayed because the GoP has not yet identified a person who can lead the unit.

ES6. The project has clear results towards achievement of the:

- Intermediate Outcome (1) Capacity to diagnose FMD improved, following from refurbishing laboratories and providing training, and reagents.
- Intermediate Outcome (2) FMD surveillance and outbreak response are improved; the project has demonstrated a well-functioning model. However, its financial sustainability is highly questionable as it depends on incentives paid by the project and subsidised resources.
- Intermediate Outcome (3) Development of an effective vaccination strategy has also been achieved. The strategy is based on good science and quality vaccine. Vaccine-matching, in which vaccine is matched to currently circulating virus strains, has been a particular success.



ES7. The project has provided effective disease control in FMD ‘hotspots’ such as the Karachi peri-urban dairy buffalo herds. These three Intermediate Outcomes have helped achieve the broader outcome of progression along the PCP: at the April 2014 West Eurasia Roadmap Meeting the country was granted provisional stage 2 status. It remains provisional until the National FMD Control Strategy is approved, which is a current project and GoP activity.

ES8. Whilst the project has done well in implementing the plans described in the Project Document, it has fallen short in some broader developmental requirements. It has given scant regard to gender issues. Capacity development has not been evaluated, but is measured solely in terms of the number of persons trained or attending meetings. Elements of the UN Human Rights-Based Approach could be more fully integrated, such as vulnerable groups’ fuller participation and inclusion in project implementation.

ES9. The project has been very strong in making partnerships and alliances. It has strengthened FAO’s partnership with GoP. It has helped forge partnerships with dairy producer associations. It has also helped FAO leverage technical support from the United States Department of Agriculture (USDA) at no cost to the project.

ES10. The project is relevant to beneficiaries’ need to control the disease. Its Outcomes remain valid. The project’s Outputs and Activities are consistent with achieving its Outcomes. The project is relevant to the FAO Country Programming Framework (CPF). It fits well with a number of key recommendations from the FAO Asia and Pacific Regional Conference (APRC).

ES11. The project has demonstrated effectiveness in achieving its planned outcome, that is, to enable the country to move along the FMD control pathway. The project’s efficiency is good. It has achieved its Outputs on time and has exceeded planned targets through efficient processes that entail integrating its work within Government veterinary systems at Federal and Provincial/ Regional levels. The project’s sustainability is a problem given that its current model depends on external funding for incentives and subsidies. An exit strategy has not been elaborated yet.

ES12. In the geographical areas where implementation is focussed, the project is contributing to its planned impact of (i) improving livelihoods and (ii) improving food security. The project also contributes to FAO’s five Strategic Objectives, which apply across the Organization’s entire programme.

ES13. The project is on track and requires no major, corrective actions. A conference, chaired by the Government, that brings together national, regional and international players, could usefully discuss options and gaps in future national FMD control. The project has demonstrated several good practices that could be relevant to similar projects. In particular, national project management has been a success; strong partnership between FAO and the Government has been crucial for efficient delivery; and regular, up-to-date monitoring of circulating FMD virus and matching with vaccine specifications is essential in a dynamic and endemic setting such as Pakistan.

ES14. The evaluation recommends:

**Recommendation 1: to FAO and to the FAO Project Team**

FAO should ensure participation and inclusion of women and vulnerable groups during project appraisal and implementation. The project should undertake as soon as possible a focused analysis aiming at improving targeting of women and vulnerable groups. A gender equality specialist should be recruited to study women's roles and whether female trainers/extension workers should lead training for women. Poor smallholders should be meaningfully involved with project implementation including discussion on how to include them in FMD preventive measures.

**Recommendation 2: to FAO Project Team**

FAO should carry out Training Needs Analysis (TNA) before embarking on further capacity building and training. Training should be followed by assessment of learning and tracking of capacity development. After some time, training results should be evaluated in terms of changes in operational capacity of laboratories. Training material should be modified and updated based on these assessments.

**Recommendation 3: to FAO and Government**

Before the end of the project, a conference, chaired by the Government, should be organised to consider future gaps in the FMD control system and to mobilize regional/international resources to address these gaps.

**Recommendation 4: to FAO Project Team and Government**

Project management should, in the next six months, work with the GoP to develop an operation system to support the veterinary field officers during FMD outbreak control and response work. The operation system will improve the logistical support of field officers to undertake field support in systematic manner. This element should be included in the national control strategy plan and in any future phase of the project.

**Recommendation 5: to FAO Project Team**

Project management should, by the end of 2014, work on improving the project logical framework and impact monitoring. The logical framework should include Indicators, Data sources, and Assumptions / Risks at Outcome and Impact levels. This review should be done in close consultation with Government and partners.

## 1 Introduction

### 1.1 Background and purposes of the evaluation

1. The mid-term evaluation (MTE) of “Development of a framework for the progressive control of foot-and-mouth disease in Pakistan - GCP/PAK/123/USA” was foreseen in the Project Document. The purpose of the evaluation as stated in the Terms of Reference of the Mid-Term Evaluation, (Annex 1 of this report) is to inform key stakeholders about project progress and its performance towards attaining expected outputs and outcomes. Project stakeholders include:

- the Project Task Force (PTF),
- the Government of the Islamic Republic of Pakistan (GoP) at Federal Ministry and local government (Livestock Departments and Veterinary Services),
- the Food and Agriculture Organization (FAO) of the United Nations (UN) at headquarters, regional and national offices,
- the donor, that is, the United States Department of Agriculture (USDA),
- the Steering Committee and Technical Working Group (TWG)
- beneficiaries including farmers, field veterinarians, laboratory staff, women and ethnic group members, and
- partners, such as, contracted civil society organizations (CSO).

2. In general, an MTE draws specific conclusions and formulates recommendations for any necessary further action by the PTF, Government, FAO and/or other parties and may identify specific good practices and lessons to be learned for the formulation and execution of other similar projects. It may identify corrective actions if necessary.

3. Pakistan was one of the countries assisted by the FAO regional project, GTFS/INT/907/ITA - Controlling Transboundary Animal Diseases in Central Asia, supported by the Italian Government. This project addressed FMD among other diseases and helped Pakistan move forward along the Progressive Control Pathway (PCP) for FMD Control.<sup>1</sup> Project results were presented at a conference on the control of FMD held in Islamabad on 17 February 2010, co-organized by the United States Department of Agriculture (USDA) - Foreign Affairs Service (FAS) and the Ministry of Livestock and Dairy Development of Pakistan. The conference highlighted that additional investments were needed to enable Pakistan to move to higher stages of the pathway.

4. Based on the outcomes of a field mission undertaken by USDA-FAS officers in Pakistan in July 2010, USDA-FAS approached FAO as the implementing agency for the formulation and implementation of a project aimed at further assisting the Islamic Republic of Pakistan in its efforts to control FMD. In September 2010, a Programme Agreement that outlines FAO and FAS’s activities and obligations was signed, that is, *Programme Agreement between the United States Department of Agriculture, Foreign Agriculture Service (USDA, FAS) and FAO for Support to Increase Sustainable Livestock Production, GCP/PAK/123/USA* (under a Framework Agreement on Increased Cooperation between USDA and FAO entered into March 2007). The Project “Pakistan – Progressive Control of Foot-and-Mouth Disease” is Article 4 of the September 2010 Agreement.

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<sup>1</sup> PCP-FMD was developed by FAO in 2008-09 and, following consultation, became a joint FAO/ World Organization for Animal Health (OIE) tool.

5. In March 2011, the GCP/PAK/123/USA Project Document that was developed by FAO was signed by the Government of the Islamic Republic of Pakistan (GoP) and FAO. Project activities commenced with the Project Coordinator's recruitment in August 2011. The project has been affected by reorganizations of both FAO project management<sup>2</sup> and GoP Ministry structures<sup>3</sup>. The project duration was planned at 36 months, but has been extended: it is currently scheduled to end September 2015 after four years implementation.

6. The original approved project budget is USD 7 140 500. The delivery to date is USD 4 772 327 and the current total budget (remaining balance) is USD 2 243 186.

7. The project implementation period reviewed is from August 2011 to June 2014. The MTE was carried out from August to October 2014 with field work in Pakistan from 18 August to 03 September 2014.

## **1.2 Methodology of the evaluation**

8. The project was assessed using standard, internationally accepted evaluation criteria, that is, relevance, efficiency, effectiveness, impact, and sustainability. The evaluation also assessed compliance with UN Common Country Programming Principles, in line with the new FAO project cycle, namely:

- Human Rights Based Approaches (HRBA)/ Right to Food/ Decent Work;
- Gender equality,
- Environmental sustainability,
- Capacity Development and
- Results Based Management.

9. The MTE used mixed methods to gather information and data, including, (i) desk review of project documents (see Annex to report), (ii) visits to institutions and meetings with stakeholders (who are listed in Annex to report), using question checklists and semi-structured interview technique, (iii) direct observation during visits to project-supported farms in different agro-economic zones (peri-urban dairy colonies, rural farms with vaccinated animals, and rural farms with non-vaccinated animals supported during FMD outbreak), (iv) direct observation during visits to project-supported regional and national diagnostic laboratories, (v) meetings with farmers not reached directly by the project, and (vi) assessment of whether/how the project involves women and under-privileged groups. During the evaluation inception phase, an evaluation matrix was developed, which included the following key evaluation questions:

- a) How did the project positioned itself conceptually and operationally to maximize the results?
- b) Have project management, institutional set-up and financial management been efficient?

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<sup>2</sup> Devolved from HQ to the Regional Office for Asia and the Pacific (RAP) and the FAO Representation in Pakistan.

<sup>3</sup> Ministry of Food, Agriculture & Livestock dissolved, replaced for a few months with Ministry of Food & Agriculture and Ministry of Livestock & Dairy Development [signatory to Project Document], replaced with current Ministry of National Food Security and Research. Livestock was at first under the Ministry of Commerce and then transferred to MoNFS&R. Reorganization created the issue of where the Animal Husbandry Commissioner (the Chief Veterinary Officer) should sit.

- c) Have the national FMD diagnosis, surveillance and field response capacity improved? Is it sustainable?
- d) Was the project able to forge and mobilized partnerships to better support FMD control?
- e) Does the project contribute to FAO strategic objectives and normative knowledge?

10. During the inception phase the team conducted an evaluability assessment on the logical framework, which led to the development of more coherent, result-oriented outcomes and intermediate outcomes against which a results-based assessment could be carried out. The version that was developed is presented in section 5.1 *Project Logical Framework and Results-Based Management*.

11. Insecurity/political unrest in Islamabad during the field mission affected the MTE. It necessitated re-scheduling meetings. It delayed the security clearance for the Team Leader to visit the project in Gilgit, where reportedly women have been more involved, and the visit was cancelled. Planned visits to vaccinated farms in Sihala and Golra area in Islamabad were not carried out. Despite this inconvenience the evaluators were able to successfully visit a comprehensive sample of places, institutions and stakeholders reached by the project. These are listed in Annex 4.

## 2 Context of the project/programme

12. FMD is a global concern because it is very infectious and has the potential to cause economic havoc with livestock production wherever it occurs. Many determinants affect disease occurrence and recurrence. These include virus evolution, host immunity and vaccination, trading and illegal movement of livestock and animal products, wildlife reservoirs, and human conflict resulting in animal displacement. The global distribution of FMD virus is very uneven reflecting, partly, national capacities to fund and implement control. It is a complex disease: the virus has multiple serotypes and subtypes, which have absent or incomplete cross-immunity and are constantly evolving. This aspect means that the vaccine suitable for a particular location may change from year to year.

13. Antigenically distinct groups of virus strains tend to occur in defined regions of the world. These groups have been categorized into seven FMD virus pools: the FMD virus strains in Pakistan are part of the west Eurasian pool.<sup>4</sup> Within the context of the west Eurasian FMD virus pool, progressive control of FMD in Pakistan is extremely important for the common goal shared by countries in the region, that is, to reduce the overall FMD burden (FAO, 2013).<sup>5</sup>

14. Pakistan has known 'hotspots' where infection is persistent and virus is endemic, including the huge dairy buffalo colonies in and around Karachi, Sindh. Virus emanating from Pakistan threatens not only local livelihoods, but regional outbreaks (through

<sup>4</sup> The seven virus pools are (FMD serotypes shown in square brackets): Pool 1, Asia east [O, A, Asia 1]; Pool 2, Asia south [O, A, Asia 1]; Pool 3, west Eurasia [O, A, Asia 1]; Pool 4, Africa east [A, O, SAT 1, 2, 3]; Pool 5, Africa west [O, A, SAT 1, 2]; Pool 6, Africa south [SAT 1, 2, 3]; Pool 7, America south [O, A].

<sup>5</sup> EMPRES News, *Pakistan to develop the first national Foot-and-Mouth Disease (FMD) control strategy*. Source: [http://www.fao.org/ag/againfo/programmes/en/empres/news\\_140513.html](http://www.fao.org/ag/againfo/programmes/en/empres/news_140513.html) accessed 30 August 2014

unregulated trade of live animals through Afghanistan to Iran and Turkey) and may even be a risk for FMD re-introduction to Europe or North America (for example, by people carrying infected meat).

15. FMD control requires both a strong national commitment to disease control and also engagement in regional approaches. A Progressive Control Pathway (PCP) was developed for countries in which FMD is still endemic. In 2008 in Shiraz, 14 countries including Pakistan formulated the FMD PCP regional roadmap leading to “*West Eurasia free of clinical FMD by 2020*”.

16. Before the project, major challenges to implement the FMD PCP existed in Pakistan, including (i) insufficient FMD vaccine available, (ii) suboptimal laboratory FMD diagnostic capacity, (iii) poor farmer awareness of disease control measures, and (iv) lack of field veterinary personnel motivation to respond to outbreaks. The country also needed an officially-adopted, coherent national FMD control strategy.

17. Thus, the context of this project is global and regional, because of the global need to know about new FMD strains evolving in Pakistan and because a regional approach is needed to control this transboundary animal disease. The context is also local and national, because FMD affects farmer livelihoods and food security and because national veterinary services require support.

18. In trilateral (USA-Pakistan-Afghanistan) meetings held in Doha and Islamabad in January and February 2010, FMD control was agreed as a priority. In mid-2010 a USDA mission visited Pakistan and developed a concept note with the Federal Livestock and Dairy Development Department. The concept note identified the three key project Intermediate Outcomes at the core of this project.

19. In September 2010 USDA and FAO signed a Programme Agreement that described FAO’s obligations to implement the Progressive Control of FMD in Pakistan.<sup>6</sup> FAO prepared the Project Document which, in March 2011, was signed by the Government of the Islamic Republic of Pakistan (GoP) and FAO. Project implementation began in August 2011.

### **3 Analysis of project concept and design**

#### ***Main findings – concept and design***

20. The project was conceived with a clear theory of change, but its logical framework was incompletely developed. The technical basis was rigorous. The institutional set-up, particularly the Government’s strong involvement, and the project’s human and financial resources were appropriately planned for the envisaged technical outputs. Beneficiaries were identified on sound technical basis. A human rights-based approach was not mainstreamed into project design.

21. The Project Document describes the Project Framework in section 3, under headings “*3.1 Impact, 3.2 Outcome, 3.3 Outputs and Activities*”. There are clear, logical linkages from Activities to Outputs, through Outcome to Impact. The project theory of change is well defined and explicit, the drivers of change and the bottlenecks were identified and analysed.

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<sup>6</sup> Programme Agreement between the United States Department of Agriculture, Foreign Agriculture Service and FAO for Support to Increase Sustainable Livestock Production, GCP/PAK/123/USA

Nevertheless, key elements were missing such as a clear outcome statement and the pathways to plausibly demonstrate impact on thematic goals such as nutrition, food security, trade and rural poverty.

22. The Logical Framework of this project is presented in *Annex A* of the Project Document and is rather sketchy. The logical framework lacked the Indicators, Data sources, and Assumptions / risks at outcome and impact level. Therefore, monitoring high level results was not conceivable. The Output indicators could be significantly improved by making them more target-oriented and measurable, that is, by stating the quality, quantity and time by which outputs are delivered. A clear definition of impact indicators would have facilitated assessment of results at the macro-level, including reviewing status of the project's contributions to the Outcome in the current MTE exercise.

23. The designed approach and methodology are adequate to achieve the stated Outcome, which is described in the Project Document as "...a framework within which progressive control of FMD in the Islamic Republic of Pakistan can be effectively implemented" and that the country will be able to "...move to higher stages of the progressive control pathway by the end of the project." The Project Document specifies three associated Intermediate Outcomes: (i) capacity to diagnose FMD is improved, (ii) FMD surveillance and outbreak response are improved, and (iii) an effective vaccination strategy is developed. However, the Project Outcome should have been expressed more clearly – see section 5.1.

24. The total resources, human and financial, are adequate for the planned implementation. An International Project Coordinator position had been included in design, but since implementation began there has been a national incumbent who performs extremely well as Project Coordinator. The amount of money planned for expendable procurement, especially vaccination, was inadequate and was addressed later through budget revision, see Section 4.2. There were inadequate financial resources to cover a contract with a private company to develop a laboratory information management system, activity 1.4.1, and the project management had to find another way to implement this activity, which included benefitting from a United States university's access to other funding. The Project Document, page 28, specifies a Study Tour for senior management/ policy makers. No provision appears to have been made for this in the project budget. The Study Tour was planned (and has now been implemented). However, the Project Review Sheet, which summarised FAO HQ's pre-project appraisal, states "NA" beside the budget line "Fellowships and Study Tours". The planned three-year time frame was probably realistic to achieve the intended results and to disburse the substantial budget, but would require efficient results-based budgeting and efficient FAO operational support for, for example, recruitment and procurement.

25. Stakeholders and beneficiaries were appropriately identified in the Project Document from the technical perspective of controlling FMD in key, target livestock populations where the project was most likely to be able to demonstrate results. These livestock populations focussed on known FMD "hotspots" in urban dairy colonies and the commercial, breeding farms that supplied them. This focus inevitably skewed beneficiary selection to their owners. This technical approach overrode a focus on the poor, even though smallholders account for a large proportion of livestock production. In Pakistan, only 33% rural households own land (and the mean land holding is 0.9 ha.), but 47% own livestock, which is high compared to other countries. More than half total household livestock production in Pakistan is derived from holdings of less than 0.5 hectare. Furthermore, in Pakistan, livestock's average

proportional contribution (through livestock product sales) to total household income is high, 37%.<sup>7</sup> More work is required to establish whether a significant proportion of these poor smallholders own large ruminants, but the data suggest that livestock production is important for poor farmers who are not targeted by the project. The project also did not target women: this is discussed in section 5.4 gender equality, below.

26. The planned in-country institutional set-up was appropriate: it makes sense that project management is based in the capital city near to the National Veterinary Laboratory, the FAO Representation and the National Agricultural Research Centre (NARC). The Animal Husbandry Commissioner is based at the same campus, which enables regular, informal and formal interaction with the project team. It is also very appropriate that implementation at provincial/ regional and district levels are completely integrated with government veterinary structures.

27. At the time of project design, FAO technical and operational supervision was envisaged to be from headquarters. In line with the FAO decentralization agenda, supervision has subsequently changed with the Organization's devolution: the FAO Representative in Pakistan has become the Budget Holder and a Lead Technical Officer (LTO) has been appointed from the FAO Regional Office for Asia and the Pacific, RAP. The Lead Technical Unit (LTU) remained with the Emergency Centre for Transboundary Diseases (ECTAD) in FAO HQ. The project was designed before this devolution and the subsequent changes could not have been foreseen with certainty.

## 4 Analysis of the implementation process

### *Main findings – implementation process*

#### **4.1 Project Management**

28. The Project Coordinator and his team manage the project efficiently: work plans are realistic and delivery is good. Financial management is efficient and prudent. The institutional oversight of the project is working well. The two steering bodies, TWG and Steering Committee, function well and give the Government a clear role in decision-making. The Government demonstrates commitment through its close involvement with project implementation at both Federal and field levels and this has been instrumental in efficient implementation.

29. The project's annual work plans have been broadly realistic. Work plans are discussed and agreed by the Technical Working Group (TWG) and presented to the Steering Committee for endorsement. The GoP as well as the donor are represented in the TWG and the Steering Committee. The project is broadly on track to complete all planned activities. Where activities have not been implemented, it is generally due to factors over which FAO does not have control. Only one activity appears delayed partly due to FAO.<sup>8</sup>

<sup>7</sup> FAO-RIGA database. 54% value of livestock production in Pakistan is from households owning <0.5 ha. Only 8% own >5.0 ha. Quoted in FAO (2012) *Livestock sector development for poverty reduction: an economic and policy perspective – Livestock's many virtues*, by J. Otte, A. Costales, J. Dijkman, U. Pica-Ciamarra, T. Robinson, V. Ahuja, C. Ly and D. Roland-Holst. Rome, pp. 161

<sup>8</sup> There is delay with one activity, namely, *Activity 3.3.2 Strengthening NVL capacity for evaluation of FMD vaccines* because the project is still seeking a consultant to train on vaccine assurance procedures and assist



30. The high quality of direct management by the Project Coordinator and his team, especially the Project Director, has been acknowledged by the donor and the Government. The FAO project team comprises the following national staff:

- Project Coordinator
- National Project Director
- Technical Field Officers (two in Islamabad, one in Karachi and one in Peshawar)
- Administration and Finance Officers (two in Islamabad)
- Drivers (five)

31. The Project Task Force has successfully implemented almost all planned project activities with over one year left for implementation. Under its effective management, the project is on course to disburse all project funds and achieve all planned outputs.

32. There is evidence that project management has made decisions effectively and strategically. For example, demand for project-procured vaccine has increased now that farmers have seen for themselves its effectiveness in preventing the disease. In response the project, with GoP and donor agreement, introduced a “cost-sharing” vaccination programme to extend vaccine availability to more farmers. Under this scheme beneficiaries pay the tax-free cost price for vaccine, but no other associated costs, such as costs of maintaining the cold chain, transport or vaccine administration fees. FAO holds money received in an account that is expected to be used for purchasing new vaccine after the last project procurement.

33. Although the Logical Framework is weak, monitoring and review processes function satisfactorily through internal and external components: (i) the Steering Group and TWG have a strong monitoring role, (ii) field veterinarians and farmers are encouraged to communicate directly with project management and have been given mobile phone numbers, (iii) each Province nominates their transboundary animal disease (TAD) Officers who monitor for GoP and are in close contact with project management, (iv) the project prepares quarterly progress reports, (v) the Lead Technical Unit (LTU) in FAO HQ has a good awareness of project and (vi) a Lead Technical Officer (LTO) in RAP was appointed in 2014. However, project monitoring is activity-based rather than results-based, in line with results-based management (RBM).

34. An exit strategy has not been elaborated by project management. Rather, there is an expectation of further funding and a draft concept note has been prepared. Management needs to consider scenarios whereby either more funds are not provided or provision is delayed.

## **4.2 Financial resources management**

35. The project budget has required reallocation to achieve results. Substantial adjustment was required for vaccine procurement: the budget line 5024 *Expendable procurement* needed to be boosted through a budget revision from USD 500 000 to USD 2 571 000. Funds reallocation was also required for national staff salaries including the Project Coordinator salary. In the original budget an International Project Coordinator was envisaged, but a National Project Coordinator effectively fulfils this role.

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in developing standard operating procedures: two candidates were almost contracted, but backed out for personal/ security reasons. Reportedly, FAO HQ has tried hard to find a suitable consultant. The project team has asked RAP to help.

36. The financial resources have been spent prudently. There was political pressure to buy more vaccine and deliver it free, but the project insisted on supervision at least. Past experience is that vaccination delivery is sub-optimal without supervision.<sup>9</sup> Project-procured vaccine has been administered correctly and with a proper cold chain. Vaccine banks funded by the project are all useful and working. Here, again, spending was prudent: it was decided not to fund all 13 vaccine banks without assurances that they would be effective.

37. The rate of delivery and budget balance at the time of the evaluation (see *Introduction*, above) is about right. The project is being implemented over a four-year period rather than the planned 36 months. At the time of evaluation just over 12 months and 31% of the budget remains. The balance is expected to be used for further substantial vaccine procurement and for continuation of planned activities, particularly capacity building for farmers and veterinary staff.

### ***4.3 Efficiency and effectiveness of the institutional arrangements***

38. The project maintains strong links with the LTU in FAO HQ through the continuity of the Animal Health Division's (AGAH) involvement. AGAH personnel know both the country and key players from the past FAO regional disease control project,<sup>10</sup> and also wrote the Project Document for this project. On the other hand, the LTO in RAP may not be as familiar with the project because the project was recently assigned to RAP in 2014. In-country project management considers that, formerly, visits from international FAO officers were more frequent, but now believes it would be better to have additional visits from HQ or RAP officers. Reportedly, their scope for international travel to projects has been restricted by edict from FAO senior management.

39. The visits by senior technical colleagues are highly valued for the technical discussion based on their wide experience in different countries, which enable consideration of various options for tackling field scenarios. These visits can help with communicating about important policy issues with policy makers. For example, the Project Coordinator considered that it would have been useful if on-site technical advice from a senior FAO officer was available when FMD vaccine production in Pakistan was discussed with all the Provincial and Federal Secretaries.

40. Two steering bodies have been established: the TWG and the Steering Committee. Both have met once or twice a year during the project (each has met four times). Representatives on the TWG include Director Generals of Provincial/ Regional Livestock and Dairy Development (L&DD) Departments and senior Federal Heads (Commissioner, NVL Principal Scientific Officer), senior members of the project team and USDA representatives. The FAO Representative has attended a TWG meeting. The Steering Committee membership is high-level, attended by inter alia the Joint Secretary of the Ministry, Secretaries from Provinces/ Regions, representatives from FAO HQ (first meeting) and the FAO Representative or Assistant FAO Representative. The Minutes of TWG and Steering meetings show that they provide a forum for the Government to input directly into the direction of the project and perform an effective coordinating role for the project.

41. The Government has shown clear and strong commitment in support of the project. In particular, (i) the Government has accommodated the project in Ministry buildings on the

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<sup>9</sup> The Project Coordinator, personal communication.

<sup>10</sup> Controlling Transboundary Animal Diseases in Central Asian Countries, GTFS/INT/907/ITA.

NARC campus in Islamabad, (ii) the project operates from L&DD Department offices in the Provinces/ Regions and project outputs are completely integrated with the Government veterinary service staff's work, (iii) the Government is actively involved with the project's management bodies, that is, the TWG and SC. The Ministry of National Food Security and Research has 'Rules of Business' that specify partnership with FAO.<sup>11</sup> The GoP has also endorsed virus sample despatch out of the country to the World Reference Laboratory (WRL) and to the USDA Plum Island Animal Disease Center, which shows the high level trust and strong working relationship that has developed between the GoP and the project scientists. By the end of the project, it is expected that a new national strategy for FMD control will be drafted and endorsed by the Government: it is expected that, in this way, the project will directly lead to change in Government policy. With a new strategy adopted, there will be an opportunity for the Government to demonstrate its commitment to the project's outcomes by investing in their continuation.

## 5 Analysis of results and contribution to stated objectives

### *Main findings – analysis of results*

42. The project been effective in delivering stated outputs. It has already completed almost all planned activities. At this stage of implementation, the project's achievement of planned outputs is entirely satisfactory and actually exceeds expectations. Significant progress has been made towards achievement of the three intermediate outcomes that were defined by the evaluation team: FMD diagnosis capacity has improved; FMD surveillance and field response have improved; and an effective vaccination strategy has been developed. These results have helped Pakistan to progress along the PCP-FMD. The higher level result of improving food security is more difficult to analyse, but it may be safely assumed that the project makes a contribution through reducing milk production losses and calf deaths due to FMD infection.

43. Gender issues are not addressed adequately: the project has not made any positive contribution to gender relations and equality. The project does not routinely collect data disaggregated by gender or vulnerable groups, nor does it ensure their active participation in implementation. The results do not demonstrate coherence with a HRBA.

44. Capacity development has been effective in both Federal and regional laboratories. Farmer capacity building has been done through awareness meetings and printed publicity material. Training needs analysis is not carried out and results of training are not assessed.

45. The project has been very strong in making partnerships and alliances. It has strengthened FAO's partnership with GoP. It has helped forge partnerships with dairy producer associations. It has also helped FAO leverage technical support from the USDA-FAS at no cost to the project.

### *5.1 Project Logical Framework and Results-Based Management*

46. During the inception phase for the MTE, both the evaluation team and the OED evaluation manager observed that the prescribed logical framework is inconsistent with FAO RBM terminology. In order to present an RBM analysis of the project, the evaluation team

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<sup>11</sup> Dr Qurban Ali, Animal Husbandry Commissioner, personal communication

has reconstructed the logical framework Outcome. This was necessary to enhance evaluability (see section 1.2 Methodology of the evaluation). Therefore, for evaluation and analysis of results, reference will be made to the following Project Outcome, Intermediate Outcomes and Outputs:

**Project Outcome:**

The load of FMD virus in Pakistan progressively reduced; food security improved through a better on-farm livestock healthcare system.

**Intermediate Outcome 1:** Capacity to diagnose FMD at disease, serotype and genotype level enhanced in districts and provincial and reference laboratories.

Outputs:

- 1.1 Strengthening of laboratory capacity for FMD diagnosis
- 1.2 Capacity building of field and laboratory staff
- 1.3 Proficiency testing of diagnostic labs
- 1.4 Development of harmonized (central and provincial) Laboratory Information and Management System (LIMS) software

**Intermediate Outcome 2:** Surveillance of FMD and response to FMD outbreaks in the country enhanced.

Outputs:

- 2.1. Awareness raising of livestock farmers
- 2.2. Capacity building of field staff and policy makers
- 2.3. Outbreak reporting, epidemiological investigation and submission of samples
- 2.4. Sero-monitoring for determining the level of virus circulation in different farming systems
- 2.5. Creation of a rapid response mechanism for FMD outbreaks
- 2.6. Creation of a National FMD Epidemiology and Information System
- 2.7. Strengthening of FMD monitoring programme in Landhi Dairy Colony in Karachi

**Intermediate Outcome 3:** Benefits of preventive early and consistent immunization practices demonstrated for effective control of FMD.

Outputs:

- 3.1. Identification of appropriate vaccine for field use
- 3.2. Strengthening NVL capacity for evaluation of FMD vaccines
- 3.3. Effective vaccination in dairy colony production system
- 3.4. Early immunization in market oriented rural dairy production system
- 3.5. Evaluation of FMD vaccination effects on productivity in different dairy production systems

## ***5.2 Achievements at Outputs level***

47. To Outputs level, the project's achievements to date are very impressive. Almost all of the activities have been completed – see Annex 6 for detailed description of each activity. Where activities have not been completed, such as equipping the central epidemiology unit, it is due to reasons extraneous to the project (in this example, the GoP has delayed nominating its Epidemiologist to lead the unit). In several instances, outputs have exceeded expectations, for example, number of vaccinations administered, number of FMD outbreaks investigated, number of laboratory tests performed.

48. *Laboratory capacity for FMD diagnosis* (Output 1.1, logical framework) has definitely been achieved. Eight (of nine intended) laboratories are using ELISA to diagnose and serotype FMD. Three laboratory buildings (Karachi Landhi Colony laboratory, Lahore FMD Research Institute ELISA Laboratory and the laboratory at the Research Centre, Mirpur) have been reconditioned. ELISA equipment and kits have been provided. In the National Veterinary Laboratory (NVL) the following are being carried out as a result of the project: (i) molecular diagnostic testing (conventional and real-time PCR), (ii) antibody titres for SP and NSP (non-structural protein), (iii) gene sequencing started. Virus isolation is also being undertaken by the National Veterinary Laboratories, Islamabad.

49. *Field and laboratory staff capacity building has been achieved* (1.2). Training given to field veterinarians and paraprofessionals enhanced their capacity to report, take samples and respond to FMD outbreaks. 47 workshops have been carried out for public and private veterinarians covering every Province/ Region. As a result, 1 378 veterinarians (the target was 800, that is, 40 training sessions each for 20 persons) have been trained in field sample collection. 967 field sample kits were provided and these are replenished when used.<sup>12</sup> Laboratory staff capacity has been significantly developed at regional and national levels, the latter in partnership with USDA experts.

50. *Proficiency testing of diagnostic laboratories* (1.3) has been achieved and the NVL is now participating in WRL proficiency testing. Development of harmonized Laboratory Information and Management System (LIMS) software (1.4) began a few months before the MTE. For outputs 1.3 and 1.4 there was innovative partnership to mobilize technical support that enabled the results to be achieved.<sup>13</sup>

51. *Awareness-raising of livestock farmers* (2.1) has been achieved at output level in terms of the count of farmers who have attended awareness meetings and also in terms of printing publicity material. 109 awareness meetings have been organised, attended by 4 538 livestock keepers, and the increased level of awareness was evident to the evaluation team during the field missions. 3 845 posters and over 16 000 leaflets have been printed in English and Urdu and distributed.

52. *Capacity building of field staff and policy makers* (2.2) has been achieved through workshops for key stakeholders (*see 1.2*) and a study tour to Turkey. 18 GoP Secretaries and Director Generals went on study tour from 23 to 29 September 2012. The study tour provided an opportunity to observe the Turkish system for FMD control in a context of low virus circulation relative to Pakistan. The study tour importantly included a visit to a vaccine production facility and enabled the tour participants to strengthen links that have the potential to lead to vaccine production in Pakistan. Since the study tour, a delegation of Turkish representatives has visited Punjab to continue discussion on FMD vaccine production in Pakistan.

53. *Outbreak reporting, epidemiological investigation and sample submission* (2.3) has also been achieved. In line with veterinary epidemiological practices, the project first agreed a FMD case definition on which to base its activities, which is, "An outbreak is FMD in an epidemiological unit (village or farm) within 21 days". After 21 days the project is considers it to be a new outbreak.

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<sup>12</sup> The disparity between the number of trainees and kits provided is because not all course participants were field veterinarians who would respond to field disease outbreaks.

<sup>13</sup> The table in Annex 6 provides details on how project management achieved this with USDA partnership.

54. Reporting, investigation and sample submission is happening effectively following project inputs: due to project capacity building, farmers now have higher awareness of what to report and when; veterinary personnel have the means to respond effectively, including sample collection kits, medicines for treatment and vaccine and their personal costs to travel to the farm covered; and diagnostic laboratories have the capacity, equipment and reagents to confirm field suspicions of FMD. The system works well with payments paid by the project to investigating veterinarians and laboratories. The Project Document anticipated 1 500 outbreak reports in three years. There were 1 088 reports in 2012 alone. A further 2 874 outbreaks were reported in 2013, and another 1 966 from January to June 2014. The evaluation has been unable to source data in Pakistan that show the change in the number of field investigations. However, it is known that veterinary personnel were generally reluctant to perform field disease investigations because expenses (such as the fuel for their motorcycles) were not covered. It can be safely assumed that reporting and follow-up has significantly increased and, moreover, is happening more rapidly than before the project.

55. The analysis of virus samples from outbreaks has increased the knowledge on circulating FMD virus. This has national and international importance. The work shows the dynamic and changing nature of circulating virus in the country. The FMD serotypes found are presented in the three tables and two maps below, which clearly show that in 2013 serotype A was more prevalent than usual. Tables 1, 2 and 3 below show that the proportion of sero-positives diagnosed in the laboratory as type A increases from 12% in 2012 to 45% in 2013 and is 8% in the first half of 2014.

**Table 1. FMD Virus Serotypes detected by ELISA test from January to December 2012**

Province	FMD outbreaks	O	A	Asia-I	mixed	ELISA -ve
Punjab	164	72	19	28	17	28
Sindh	686	394	51	97	33	111
KPK	120	24	6	15	20	55
Balochistan	19	7	3	-	2	7
Gilgit-Baltistan	7	-	1	2	1	3
FATA	4	3	-	-	0	1
AJK	60	22	18	-	1	19
Islamabad	28	11	5	5	0	7
<b>Total</b>	<b>1088</b>	<b>533</b>	<b>103</b>	<b>147</b>	<b>74</b>	<b>231</b>
<b>as % of positives</b>		<b>62%</b>	<b>12%</b>	<b>17%</b>	<b>9%</b>	

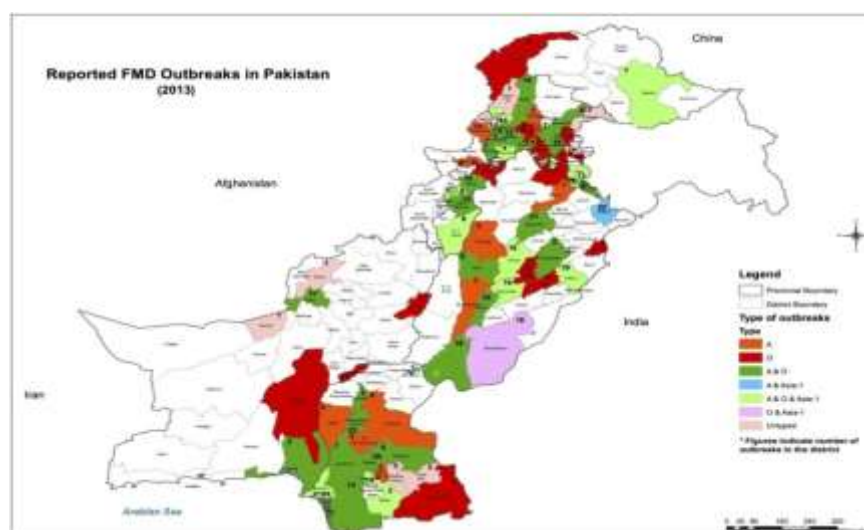
**Table 2. FMD Virus Serotypes detected by ELISA test from January to December 2013**

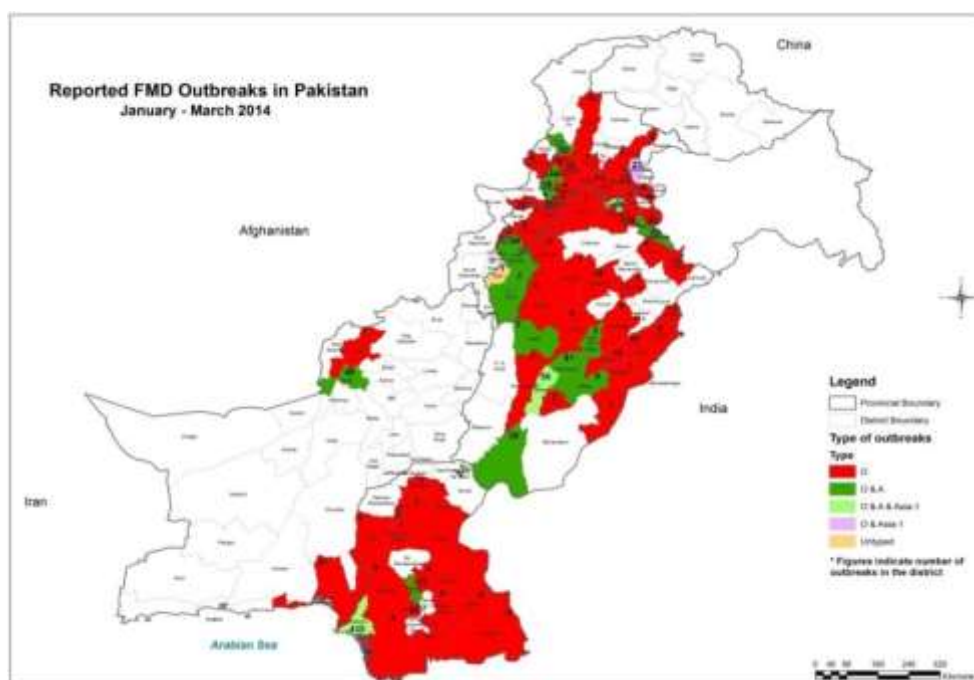
Province	outbreaks	O	A	Asia-I	mixed	negative
Punjab	177	65	47	21	3	41
Sindh	2364	991	959	80	22	312
KPK	171	61	44	2	17	47
Balochistan	42	15	3	-	1	23
Gilgit-Baltistan	7	2	-	-	5	-
FATA	18	-	11	-	-	7
AJK	89	31	25	5	-	28
Islamabad	6	1	2	2	-	1
<b>Total</b>	<b>2874</b>	<b>1166</b>	<b>1091</b>	<b>110</b>	<b>48</b>	<b>459</b>
<b>as % of positives</b>		<b>48%</b>	<b>45%</b>	<b>5%</b>	<b>2%</b>	

**Table 3. FMD Virus Serotypes detected by ELISA test from January to June 2014**

Province	outbreaks	O	A	Asia-I	mixed	negative
Punjab	343	269	16	5	2	51
Sindh	763	496	60	50	28	129
KPK	260	157	18	0	0	85
Balochistan	140	85	11	0	0	44
Gilgit-Baltistan	5	3	2	0	0	0
FATA	25	17	0	0	0	8
AJK	419	242	4	1	4	168
Islamabad	41	26	9	2	0	4
<b>Total</b>	<b>1996</b>	<b>1295</b>	<b>120</b>	<b>58</b>	<b>34</b>	<b>489</b>
<b>as % of positives</b>		<b>86%</b>	<b>8%</b>	<b>4%</b>	<b>2%</b>	

56. Following its epidemiological investigations, the project has displayed the spatial distribution of different FMD serotypes in the country each year. The maps reproduced in Figure 1 and Figure 2 below show the distribution of serotypes diagnosed by the project in 2013 and in the first quarter of 2014. The maps show the dynamic and changing spatial nature of FMD in Pakistan in this period. This information underlines the importance of deriving up-to-date information on the nature of circulating virus so that appropriate vaccine can be procured and used. This information is a significant project output.

**Figure 1. Distribution of FMD serotypes reported in 2013**

**Figure 2. Distribution of FMD serotypes reported January to March 2014**

57. *Sero-monitoring for determining the level of circulation in different farming systems (2.4)* has been achieved. The farming systems investigated include peri-urban dairies, small farms, animals including yaks in mountain areas and desert area farms. 2 038 samples were collected and analysed for non-structural viral protein. The analysis showed rather high FMD prevalence in Mirpur dairy farms, Cholistan desert animals and in yaks in the high altitudes in Gilgit: 50% Mirpur dairy farms were positive, 24% Mirpur small farms were positive, 62% Cholistan farms were positive, and 43% yak were positive. This suggests there is more work to be done to control virus circulation in these areas. On the other hand, the sero-monitoring found much lower prevalences on small farms: 3.5% Muzzaffarabad small farms were positive, 8.5% Rawalakot small farms positive.

58. *Creation of a rapid response mechanism for FMD outbreaks (2.5)* has been achieved through vaccine procurement (exceeding what was planned), cold chain and vaccine bank establishment and an agreed procedure to treat and vaccinate animals in and around a reported outbreak. Standard Operating Procedures (SOP) for response were agreed and accepted by the Government at a meeting at Faisalabad University Veterinary Faculty in August, 2011. 1 298 field veterinary officers are responding to FMD outbreaks as per SOP prepared by the project.

59. *Creation of a National FMD Epidemiology and Information System (2.6)* has not been implemented because the Government has not yet confirmed the epidemiologist who will lead it. The Federal Government twice nominated scientists to lead the federal node, that is, from NVL and later from NARC Islamabad. The scientist from NVL changed his job and joined a university. At present, an epidemiologist from NARC is in-charge of the node but he is too busy in his other assignments and cannot devote time to carry out activities designed under the node. However, under this output, a periodic bulletin has been achieved, *activity 2.6.2. Strengthening FMD monitoring in Landhi Dairy Colony Karachi (2.7)* has been achieved: veterinarians collect tissue samples from outbreaks and the laboratory near the



colony performs ELISA testing following project support (building repair, laboratory equipment, test reagents and training).

60. The project had notable success in achieving output 3.1 Identify appropriate vaccine for field use. For 2012 the project and expert committee agreed trivalent (O, A and Asia-1) vaccine with sub-serotypes appropriate (O Pan-Asia II, Iran05/Tur06 and Asia-1 Shamir). These vaccine specifications were approved by FAO LTU and WRL. The project advocates (i) high dose, that is, >6 PD50 rather than conventional 3 PD50, (ii) a booster dose one month after first vaccination, and (iii) six-monthly revaccination. 2013 vaccine specifications were reviewed based on vaccine matching (with project-derived and project-tested field isolates) carried out both at WRL and Plum Island Animal Disease Center (ADC). For the 2013 procurement the vaccine identified was O Pan-Asia II, A Tur/06 and Asia-1 Sindh08. These 2013 vaccine specifications were approved by FAO LTU and WRL and ADC. Virus sequencing and matching suggest the same vaccine for 2014 procurement.

61. *Output 3.2 Strengthening NVL capacity for evaluation of FMD vaccines* has not yet been achieved. The consultant required to train staff on vaccine laboratory assurance was not recruited.

62. *Effective vaccination in dairy colony production system (3.3)* has been mostly achieved. Colonies are selected, animals are vaccinated and sero-monitored (activities 3.3.2 and 3.3.4), but it was not practical to collect oral swabs from animals leaving colonies (activity 3.3.5) because the holdings lacked animal handling facilities suitable to restrain the head for taking these samples. Instead, some slaughterhouse oropharyngeal samples have been collected. The number of vaccinations provided has exceeded expectations. It was planned to vaccinate 10 000 animals in dairy colonies in Punjab, Sindh, Baluchistan and Khyber Pakhtunkhwa, that is, 40 000 total. The table below shows that over 72 000 animals have been vaccinated.

**Table 4. Vaccination in dairy colonies, showing location, number of farms and number of initial and newly vaccinated animals**

Location	Farms	Initial vaccination	New vaccination	Total
Khalsa area, Peshawar	330	10 000	2 382	12 382
Landhi, Karachi	27	6761	8 730	15 491
Nagori Society, Karachi	28	4839	6 113	10 952
Rakh Chandra Rai Lahore	183	7 014	2 686	9 700
Eastern bypass, Quetta	16	3 927	307	4 234
Quary Road, Quetta	33	7 567	4 396	11 963
Livestock farms, Mirpur	30	945	0	945
Suhan & Tarlai Islamabad	278	6 529	0	6 529
<b>Total</b>	<b>925</b>	<b>47 582</b>	<b>24 614</b>	<b>72 196</b>

63. The project has achieved Output 3.4 Early immunization in market oriented rural dairy production system but Activity 3.4.1 Selection of villages for early immunization was implemented somewhat differently from the original concept. The plan was to target breeder farms, especially those that supplied peri-urban dairies with replacement cows. What the project actually did was to get each Livestock Department to identify breeder farms in three areas in their Province/Region and five villages in each area for vaccination. Because of possible disputes between farmers about who would receive the free immunization, it was better for the project that the local authorities took responsibility for farm selection.

64. Output 3.5 Evaluation of FMD vaccination effects on productivity in different dairy production systems has been partially completed. A comprehensive Baseline Survey has been completed. Key baseline findings include,

- Around 87% farmers are not aware of FMD vaccine.
- More than half the farmers who are aware of FMD vaccination do not vaccinate their animals because of the vaccine cost.
- Cost estimates of milk loss for cattle and buffaloes due to the disease in peri-urban dairies.<sup>14</sup>

65. The project now has data from multiple production systems. The data require more analysis and evaluation.

### 5.3 *Achievements at Outcome level*

66. This section discusses the achievement of the outcome “The load of FMD virus in Pakistan progressively reduced; food security improved through a better on-farm livestock healthcare system.” The analysis below considers, first, the results towards achievement of the three Intermediate Outcomes.

67. For Intermediate Outcome (i), *capacity to diagnose FMD is improved*, there are clear results. FMD is now being diagnosed by ELISA test and serotyped at eight Provincial/Regional Laboratories. This clear result follows project activities and outputs, namely, training, laboratory hardware and reagents. Similarly, at national level, the establishment of molecular diagnostic testing in the NVL has improved capacity significantly. Again, the project directly supplied equipment and reagents and, arranged capacity building for the senior laboratory technicians. For this, the project mobilised USDA experts through its strong partnership with USDA. Because of the project, for the first time the country can sub-type FMD viruses. This important result enables matching vaccine to current virus strains.

68. Intermediate Outcome (ii), *FMD surveillance and outbreak response are improved*, has been achieved in the field, but not at national level. A central epidemiology unit or node has not been established, because the GoP has not identified the person to lead it. In the field, where farmers’ awareness has been raised, they now report FMD because, unlike before, they know there will be a veterinary visit and response (treatment and vaccination). Thus, because there is likely to be a response, the sensitivity of farmer reporting, i.e. passive surveillance, has substantially improved. Although the authorities did not provide data on number of field visits, there is no doubt that the frequency has increased. This outcome result has come about due to a combination of raised farmer awareness, raised field veterinary personnel capacity, raised laboratory technical capacity, and direct inputs from the project (sample kits, medicines and vaccine, laboratory equipment and expenses).

69. The project has worked closely with the GoP at all levels to achieve this improved outbreak response: central government and Provincial / Regional Director Generals have approved the strategy. Government field veterinary officers carry out the disease investigation and response. Government laboratories test the samples.

70. It is noted that the project’s outbreak response strategy includes payments by the project. A field veterinarian receives PKR 1 000 when samples he submitted are positive for FMD and another PKR 1 000 when he goes back and treats affected animals. The project

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<sup>14</sup> PKR 64 590 per cow and PKR 55 605 per buffalo.

also makes a payment to laboratories for ELISA testing. The farmer receives vaccine and treatment drugs that are provided free by the project. More consideration is needed on how to make the strategy sustainable without continued external funding.

71. Intermediate Outcome (iii), *development of an effective vaccine strategy*, has been achieved. The project has procured FMD vaccine that is more effective than any other available in Pakistan. It is well tolerated by vaccinated dairy animals and farmers report less ‘milk-drop’ than with other FMD vaccine. The vaccine is protective because of good veterinary science: the project benefits from FAO’s normative knowledge base on circulating FMD strains; the project itself refined this by subtyping current field virus isolates and carrying out vaccine matching. Farmers prefer the project vaccine and want more at the same quality and price.

72. A FMD vaccination strategy has been developed that involves a booster vaccination one month after the first vaccination and repeat doses six-monthly thereafter. The project has developed this strategy with its own management and technical ability, with technical support from the FAO LTU, and with expert consultation from the FMD World Reference Laboratory, Pirbright, as well as USDA. Throughout this regimen, high potency (six times PD<sub>50</sub>) is used, which is higher than the potency required for vaccination in FMD endemic areas. 15, 16 Effective vaccination has also been demonstrated in yaks.

73. The above three components are part of the overall intended Outcome that encompasses moving to higher stages of the FMD progressive control pathway (PCP). At the start of the project, Pakistan was in PCP stage 1.<sup>17</sup> At the time of evaluation, provisional PCP stage 2 status has been reached.<sup>18</sup> It is provisional because the national strategy was presented in draft form. The project is supporting the GoP to complete the national strategy document and when this is done, attaining PCP stage 2 will be a significant result for the project. This is an important step in achieving the result, “the load of FMD virus in Pakistan progressively reduced”.

74. It is more difficult to determine the achievement of the Outcome “food security improved through a better on-farm livestock healthcare system”. Data sources as verifiable indicators for outcome and impact were never defined in the logical framework. Although food security data are not available, it can be assumed that project vaccination has reduced disease incidence, and reduced clinical FMD is correlated with increased milk production and, in this way, with improved food security. Where the project is active it is clear that there is a better on-farm response to the disease: veterinarians visit farms, take samples and provide follow-up vaccination and treatment at no cost to the farmer. Before project training and support, this did not happen.

75. In order to achieve its Outcome, the project has used FAO normative and knowledge products. Training contents are based on FAO publications and the project has used these

<sup>15</sup> The OIE Manual of diagnostic tests and vaccines for terrestrial animals states that, for routine vaccination programmes in countries and zones recognised as ‘free from FMD with vaccination’ or in ‘FMD endemic areas’ a 3 PD<sub>50</sub> potency level is required.

<sup>16</sup> For an FMD vaccine batch to be eligible for use in emergency situations within the European Member States, the PD<sub>50</sub> content must be greater or equal to 6 (Council directive 2003/85/EC).

Source: [http://www.fao.org/ag/againfo/commissions/docs/research\\_group/paphos/app32.pdf](http://www.fao.org/ag/againfo/commissions/docs/research_group/paphos/app32.pdf) accessed 10 Sep 2014.

<sup>17</sup> This was determined at the October 2009 West Eurasia Regional Roadmap meeting, Istanbul, Turkey.

<sup>18</sup> This was agreed at the April 2014 West Eurasia Regional Roadmap meeting, Astana, Kazakhstan.

publications to design its sample collection protocol and principles for outbreak control and improving surveillance.<sup>19</sup> The project itself has made contributions to the knowledge base on FMD. A list of project publications is included in Annex 5. The project has developed an effective surveillance model. The project has improved vaccination efficacy by identifying the prevalent virus strains.

#### 5.4 Gender equality

76. Whilst having to adapt to the country's cultural context, gender issues have not been given due consideration in project design, in beneficiary identification or in implementation. The project task force core team is entirely male. The capacity building provided to farmers has reached an audience so far who are more than 99% men. This may be appropriate given that men manage the dairy buffalo and cow units with which the project primarily works and men make decisions about vaccinating animals. On the other hand, the evaluation found that on small farms women may also milk animals. Women may also have a role in recognising when animals are sick and in tending sick animals.

77. Research indicates that, in general in Pakistan and Afghanistan, women have greater involvement in livestock-related activities compared to men, who, on the other hand, are more involved in crop-related activities than women. The research provided sex-disaggregated information from the Punjab province of Pakistan that clearly showed most livestock-related activities there are carried out by women.<sup>20</sup>

78. In Gilgit, which the evaluation team could not visit, women reportedly have more interaction with the project and more women have attended meetings. By contrast, in Khyber Pakhtunkhwa and in the Federally Administered Tribal Areas (FATA), it is challenging to interact with women because of cultural norms. Access to women in other project field areas falls between these extremes. If the project task force team had at least one female staff member, it would have facilitated the project outreach to women in all the regions.

79. Management has not really considered a gender perspective in FMD control. No assessment has been made on the extent to which women could or should be involved in implementing project activities at field level. Within the project, women work only as skilled laboratory scientists and in clerical administration. There is a need to investigate at household level what roles women may have in relation to FMD control and whether women should be engaged more with the project, for example, through targeted capacity building led by women facilitators/ extension workers. As currently implemented, the project is not likely to make any positive contribution to gender relations and equality. The potential for the project to work more with women should be assessed.

#### 5.5 Capacity development

80. In the laboratories at all levels there has been clear capacity development resulting from the activities described for Intermediate Outcome (i), *capacity to diagnose FMD is improved*.

<sup>19</sup> The most used publication is FAO (2002) Animal Health Manual no 16: Preparation of Foot-and-Mouth Disease Contingency Plans

<sup>20</sup> Tibboo et al (2009) Gender sensitive research enhances agricultural employment in conservative societies: the case of women livelihoods and dairy goat programme in Afghanistan and Pakistan presented at a FAO-IFAD-ILO Workshop, Rome, 2009. Source [http://www.fao.org/fileadmin/user\\_upload/fao\\_ilo/pdf/Papers/24\\_March/Tibbo\\_et\\_al\\_-\\_Paper\\_final.pdf](http://www.fao.org/fileadmin/user_upload/fao_ilo/pdf/Papers/24_March/Tibbo_et_al_-_Paper_final.pdf) accessed 01 October 2014

New tests with new equipment are carried out routinely. International proficiency testing at NVL has verified the quality of the laboratory test practices. This is clear evidence that capacity development has been effective in these laboratories.

81. For farmer awareness training, there was no evidence that training needs analysis (TNA) has been carried out. The prior knowledge, or lack of it, was assumed. Good training practice starts with a TNA, which helps to define the target group's learning needs. Usually project management has a view on what training may be required, based on information from preparing the project and the planned project activities. The TNA validates this and provides detail on the needs. A TNA has three parts (i) Characteristics of the participants (e.g. level of education/ literacy), (ii) Existing knowledge and skills (e.g. FMD control: awareness/use of vaccination), and (iii) Attitudes (e.g. what do they think about paying for FMD vaccine?). With a better understanding of the participants and their training needs, the TNA is followed by setting clear training objectives that clearly state what participants will be able to do at the end of the training. These steps were not covered by the PTF.

82. The project has achieved livestock farmer awareness-raising in terms of the count of farmers who have attended awareness meetings, but there is a lack of follow-up evaluation on the effect of the training. The project does not do an assessment of training uptake, such as learning reviews at the end of training sessions. For example, what are the key training points? Are these understood by participants? There are no post-training surveys to indicate behaviour change, and, later, results of training are not assessed. However, there is evidence that farmers report disease more than before, which may be due to more awareness as well as their expectation that the veterinary services will respond with free treatment.

## 5.6 Human Rights-Based Approach

83. The right to adequate food is enshrined in the 1948 Universal Declaration of Human Rights and in a number of subsequent international and regional covenants. Part of an international instrument that appears relevant to this project is the following excerpt from the International Covenant on Economic, Social and Cultural Rights, Article 11 (2).<sup>21</sup> This instrument includes the text, *“The States Parties to the present Covenant, recognizing the fundamental right of everyone to be free from hunger, shall take, individually and through international cooperation, the measures, including specific programmes, which are needed: (a) to improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge...”*. This project definitely contributes to improving bovine production through use of advanced technical and scientific knowledge.

84. Mainstreaming a Human Rights-Based Approach (HRBA) follows UN agencies' commitment to the Understanding on a HRBA (UNCU). This entails projects/ programmes furthering the realization of human rights in planning and implementation. Human Rights Principles to be mainstreamed include (i) non-discrimination and equality, (ii) participation and inclusion, and (iii) human rights standards (availability, accessibility, quality and acceptability).<sup>22</sup> These three principles will be considered in turn.

85. First, non-discrimination and equality. There is no evidence that the project has statistical data that is disaggregated by gender or vulnerable groups such as the poor or

<sup>21</sup> Cited in Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security (FAO, 2004).

<sup>22</sup> UNDP (2012) Mainstreaming Human Rights in Development – Policies and Programming: UNDP Experiences

particular ethnic groups. Poor farmers' needs have not been prioritized in project design or implementation. Poor farmers may own a few head of bovine animals, that is, cattle, buffaloes or yaks, but the project appears to work mainly with large producers. This implementation focus with large producers is consistent with the Project Document, which did not build in a poverty perspective in its design. Rather, the Project Document emphasises the FMD problem in peri-urban dairies and identifies the principal beneficiaries as:

- the Federal Ministry,<sup>23</sup>
- large ruminant owners, producers and traders (who benefit directly from a reduced impact of FMD and improved ruminants disease prevention and response methods),
- National and Provincial Veterinary Services, and
- the international community which will benefit from a better understanding of FMD situation and a reduced risk of the spread of FMD.

86. Second, participation and inclusion. No effort appears to be devoted towards ensuring that a representative number of people, including those whose voices are not usually heard, are involved actively and meaningfully in project implementation. For example, FMD control strategy options such as payments do not appear to have been discussed with poor farmers.

87. Third, availability, accessibility, quality and acceptability. Availability: every effort does seem to have been made to make the project resources available to all, within budgetary constraints to the population that can be reached. Accessibility: since vaccination and disease response is provided free, it is accessible to all. However, the poorest may not be able to access the cost-share vaccine due to its cost. Quality and acceptability: the quality of goods and services are ensured through procurement from assured sources and through quality assurance of laboratory testing. The various cultural patterns in different areas are taken into account by the project, which has shown flexibility in meetings with farmers that are adapted to local values and security conditions.

88. All UN Country Teams (UNCT) must use a Human Rights-Based Approach (HRBA) to support country analysis, advocate for priorities in the national development framework, and prepare a United Nations Development Assistance Framework (UNDAF) that demonstrates a strategic use of UNCT resources and expertise.<sup>24</sup> The project's coherence with this is discussed in section 6.1 Relevance, below.

## **5.7 Partnerships and Alliances**

89. The project has strengthened FAO's partnership with the GoP, both at Federal Ministry level and at Regional/ Provincial level. The two parties have worked closely together and both feel ownership of the positive results that the project has delivered.

<sup>23</sup> The Project Document specifies the Ministry of Livestock and Dairy Development, but the Ministry was restructured soon after project inception.

<sup>24</sup> Source: United Nations Development Group, [http://www.undg.org/content/programming\\_reference\\_guide\\_%28undaf%29/un\\_country\\_programming\\_principles/human\\_rights-based\\_approach\\_to\\_development\\_programming\\_%28hrba%29](http://www.undg.org/content/programming_reference_guide_%28undaf%29/un_country_programming_principles/human_rights-based_approach_to_development_programming_%28hrba%29) accessed 15 Sep 2014

90. It was anticipated that the project will contribute to continuing the dialogue between FAO and OIE on the PCP requirements.<sup>25</sup> This has proved to be the case with project results feeding into decisions on the Pakistan's PCP status at the OIE Regional Roadmap meetings.

91. The project has also helped establish partnerships between dairy producer associations, such as the Karachi Dairy Farmers Association, and national institutions. The latter implement the FMD vaccination and have been closely involved with discussions convened by the project on, for example, the vaccination cost sharing.

92. It has been a great benefit to the project that FAO has worked closely with USDA-FAS officers in technical aspects of implementation. FAS deployed a veterinarian to Pakistan soon after project inception and the staff member in this post remained closely involved with the project. This has mutual benefit: USDA benefits as the project contributes to US research initiatives; the project benefits as some project activities, such as high level capacity building, take place without cost to the project. There have been several examples of the project's strong partnership leading to mobilisation of US resources. These include:

- Five persons attended special training 'Laboratory Quality Management for Pakistan' in Ames, USA, with USDA special funding,
- The Foreign Animal and Zoonotic Disease Defense (FAZD) based at Texas A&M University (TAMU) secured separate US funding which was used to develop LIMS software for the project,
- USDA/ Plum Island Animal Disease Center provided two days epidemiology training for senior Provincial specialists at NARC, at no cost to project, and
- The University of California (Davis) gave two days training in bioportal software to federal and provincial TAD officers, at no cost to the project.

## **6 Analysis by evaluation criteria**

### **6.1 Relevance**

93. The project has high relevance. It is relevant to beneficiary needs, the West Eurasia PCP-FMD Roadmap and FAO programming priorities.

94. Further to the findings highlighted in the Human Rights-Based Approach (section 5.6). The project addresses a real need of beneficiaries, that is, the need to control FMD more effectively, and is relevant to this need. Overall, the project's Outcome and Intermediate Outcomes are still valid. The livestock production sector has a very real problem with FMD and its control is relevant to the need. The project's Activities and Outputs are consistent with the attainment of the intermediate outcomes and furthering the country's advance along the internationally agreed progressive control pathway for FMD. The PCP-FMD was developed by FAO and adopted jointly by FAO and OIE under the Global Framework for Progressive Control of Transboundary Animal Diseases, GF-TADs. The PCP operates as a regional initiative implemented through OIE regional roadmaps. The project is entirely

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<sup>25</sup> FAO (2010) Project Review Sheet

relevant to the West Eurasia Regional Roadmap. Project task force members attend and contribute to its region's Roadmap Meetings.

95. The project has been coherent with related aid initiatives. Around the time of approval, Pakistan had been supported through the FAO regional project GTFS/INT/907/ITA – Controlling transboundary animal diseases in Central Asia, which assisted Pakistan to progress along the FMD PCP from stage 0 to stage 1. Project results were presented at the conference on the control of FMD co-organized by USDA-FAS in Islamabad on 17 February 2010 and this project builds it.

96. A current regional project is Regional Cooperation on Highly Pathogenic Emerging and Re-emerging Diseases in Asia, OSRO/RAS/901/EC, which is concerned with highly pathogenic avian influenza, FMD & peste des petits ruminants as well as emerging diseases. It works with the regional bodies ASEAN, Association of Southeast Asian Nations, and SAARC, the South Asian Association for Regional Cooperation. FMD has been a significant component of that project. This project actively participated in their meetings.

97. Regional UN/FAO priorities and policies to which the project should have relevance are (i) the FAO Country Programming Framework (CPF), (ii) the Pakistan United Nations Development Assistance Framework (UNDAF) which was reviewed and resulted in the 2009 One UN Program in Pakistan, also known as “The One Program” and (iii) the FAO 31st Regional Conference for Asia and the Pacific (APRC) Key recommendations for FAO's Actions for the Programme of Work and Budget (PWB) 2012-13.

98. The FAO CPF (2012) sets out four priority areas for its programme with the GoP. These four priorities cover (a) food and nutrition security, (b) sustainable agricultural economic growth, (c) disaster risk reduction (DRR) and emergency response, and (d) capacity development for the agriculture sector. The project has relevance to these priorities. More than eight million families have cattle and buffaloes and depend on their dairy products for an important household nutrition component. When FMD strikes, dairy production is seriously harmed, so the project contributes to maintaining milk supply (priority area, a). Milk makes a contribution to the economy and, thus, the project makes its contribution to agricultural economic growth (priority, b). In Pakistan, DRR and emergency response are mainly concerned with natural disasters such as floods and earthquakes. FMD (and other animal disease) outbreaks often follow displacement of people and animals and can exacerbate suffering in emergencies. The project has demonstrated a more effective control strategy (priority, c). Finally, the project has made a major contribution to capacity development, as described above (priority, d). Thus, the project fits well with the CPF. The CPF was prepared around the time that the One Program was revised, and it was tailored to fit with the latest strategic priorities in the second One Program, OP-II.

99. The first One Program (OP-I) was for the period 2007-12. Thus, it was current at the time of project design. It was to be implemented by the UN member agencies from 2009.<sup>26</sup> OP-I defines principal guiding criteria for One Program implementation which are:

- a) Pro-Poor Focus.
- b) Federal - Provincial Balance
- c) Build on Past Experience.
- d) Sustainability.

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<sup>26</sup> Executive Summary, The One Program 2009



e) Baseline quantifiable indicators for future project evaluation.

100. Despite the fact that pro-poor focus was a principal guiding criterion, the project is weak in its pro-poor focus, principal guiding criterion a), and weak in having inbuilt financial mechanisms for sustainability, criterion d). However, the project is highly relevant to criteria b), c) and e). It balances well Federal and Provincial Governments' interests. It builds well on past project experience. It commissioned a comprehensive baseline study, though this was delivered considerably after project implementation began.

101. OP-I identified five Joint Programmes, one of which was Agriculture, Rural Development and Poverty Reduction. FAO (along with six other UN agencies<sup>27</sup>) was a key partner in this Joint Programme, for which estimated resource requirements were USD 260 000 000. However, FAO's share of One UN's funds (USD 63 000 000) was just USD 2 082 000. Thus, One Program did not appear to have had significant bearing on FAO's programme, which also has independent funding streams.

102. At FAO regional level, the 31st APRC made 38 key recommendations.<sup>28</sup> Many of these have no connexion with the project because they concern other areas of work such as rice production. However, the project contributes to six of the key recommendations:

- Recommendation 1, strengthening agricultural research and better linking of it to extension by promoting partnerships among research institutions, extension agencies and other key stakeholders,
- Recommendation 15, assist member countries through facilitation of knowledge generation, dialogue and dissemination,
- Recommendation 17, assist member countries through facilitation of global and regional cooperation to strengthen awareness raising and policy dialogue,
- Recommendation 18, assist member countries through research-extension linkages, such as through the Global Agenda of Action for Sustainable Livestock Sector Development,<sup>29</sup>
- Recommendation 30, promote food security and nutrition, and
- Recommendation 32, manage trans-boundary plant pests and animal diseases.

103. The project has an opportunity to increase its relevance to part of APRC Recommendation 1. This recommendation, on strengthening agricultural research and better linking of it to extension, ends with the phrase, "and increasing the number of female extension workers". This is an area of work the project is yet to explore.

104. Thus, overall, the project has high relevance. It is relevant to beneficiary needs, addresses an important problem and has an Outcome and Intermediate Outcomes that remain valid. It is entirely relevant to the regional FMD control strategy implemented through the West Eurasia PCP-FMD Roadmap. It is coherent with recent and ongoing related projects. The project is relevant to the four priority areas of the 2012 FAO CPF for Pakistan. In terms of coherence with the first UN Pakistan One Program's five principal guiding criteria, the

<sup>27</sup> ILO, UNDP, UNESCO, UNIDO, UNIFEM and WFP

<sup>28</sup> Report on Implementation of the 31<sup>st</sup> APRC Key Recommendations for FAO's Action related to Regional Priority Framework and Achievement of Organizational Outputs (OOs) of RA and SAP for PWB 2012-13

<sup>29</sup> RPF-B: **B01P201** - Technical support, strategic advice and policy guidance is provided to design and implement emergency and long term development projects, programs and policies that enhance productivity, facilitate access to in- and output markets and contribute to food and nutrition security within the broader goal of sustainable livestock sector development (LIVESTOCK OFFICERS).

relevance is mixed: the project is weak in its pro-poor focus, and weak in having inbuilt financial mechanisms for sustainability. On the other hand, the project is highly relevant to the other OP-I criteria: it balances well Federal and Provincial Governments' interests; it builds well on past project experience; and it has commissioned a comprehensive baseline study. At FAO regional level, the project contributes positively to six APRC key recommendations.

## **6.2 Efficiency**

105. The project's efficiency is very good. Efficient delivery followed strong management, working closely with Government, the FAO LTU's involvement and technical support and partnership with USDA-FAS, which has provided additional technical expertise.

106. There has been excellent delivery of project outputs, which have been delivered on time and have exceeded planned targets. Project management has been exemplary and good management has been a major factor in ensuring that activities have been timely and that problems encountered have been overcome.

107. It is difficult to assess whether the activities have been cost efficient because alternative delivery scenarios with which to compare them are not there. However, the general satisfaction of the donor, which considers the project to be one of its best in Pakistan, is significant.

108. The good efficiency reflects strong partnership with Government. There is a compatible fit between the project and the GoP counterpart: the Animal Husbandry Commissioner sits in same campus, which facilitates close relations with him and the Secretary. At Provincial level, each time the PTF visits, they meet and brief the Director General and Secretary. Active participation in the TWG and Steering Committee ensures Government ownership of the project outputs.

109. The project's efficiency has been enhanced by close involvement of the FAO LTU in Rome. However, the PTF would benefit from more frequent visits than are currently taking place in order to engage with policy dialogue.

110. The partnership and close involvement of USDA-FAS has also helped ensure project efficiency. The project has been able to benefit from technical expertise for, for example, laboratory capacity building.

## **6.3 Effectiveness**

111. The project has been implemented effectively. It has already achieved its three intermediate outcomes. It has helped Pakistan progress along the PCP-FMD so that the country now is provisionally at stage 2, contingent on the National Strategy, which is expected to be finished and approved before the end of the project.

112. The intended project Outcome was to provide a framework within which progressive FMD control can be effectively implemented to enable the country to move along the progressive control pathway for FMD. This planned framework had three components (Intermediate Outcomes): (i) laboratory diagnosis, (ii) disease surveillance and response, and (iii) vaccination. Firstly, laboratory FMD diagnosis capacity has been effectively raised. Secondly, passive disease surveillance and veterinary response are functioning well with project incentives. Thirdly, an effective vaccination strategy has been developed, piloting an

organised vaccination strategy to control FMD in Pakistan with quality vaccine that is appropriate for current FMD subtypes.

113. The project has already achieved its intended outcome as described in the Project Document. It has demonstrated how progressive FMD control through vaccination could be achieved, albeit with external funding and sufficient political commitment. It has helped Pakistan move, provisionally, to FMD PCP stage 2. Stage 2 is expected to have been achieved by the end of the project.

114. To move from PCP stage 2 to stage 3, an aggressive FMD control strategy will be required. This will entail a major vaccination campaign for at least ten years. Although the project has demonstrated an effective vaccine strategy, current coverage of the national herd is very small. For effective national FMD control, 80 to 85% of the national herd should be vaccinated. The livestock population in Pakistan is vast. Around 1% of susceptible large ruminants may have been reached by the project. Therefore, the challenge remains of how to link the outcome thus far achieved to future, comprehensive FMD control in Pakistan with the high costs and strong political commitment this will entail.

#### **6.4 Sustainability**

115. The financial sustainability of the existing FMD control model is doubtful. The model is founded on subsidies and payments. There may be opportunities to reduce vaccine costs and increase cost-recovery from farmers, but vaccine quality must be maintained. Sustainability will require careful planning and Government commitment.

116. The project has succeeded in demonstrating effective FMD control in Pakistan. It is achieving this with subsidies and incentives. Subsidies include free vaccine, two senior laboratory technician salaries at NVL, provision of sample kits and laboratory consumables. Incentives include vaccine cost-sharing and the fees paid for sample submission, outbreak response and laboratory testing. There appears to be a possibility that a future project phase may be funded. In that case, perhaps consideration of the extent to which the project may continue after current donor funding ends can be postponed. The existing model's foundation on subsidies and incentives suggests that it may collapse without continued external funding.

117. There is potential for more cost-recovery from farmers for FMD vaccination. Farmers met during the field work stated a willingness to pay provided that the vaccine has assured quality. In this regard, one of the most important project sub-components for which funding must be found by the authorities is regular updating of circulating virus subtypes and vaccine matching with these strains.

118. More in-country vaccine production will likely reduce national vaccination programme costs. The project is helping the Punjab Government with its vaccine production plans by advising on Government-owned and/or private production and the project has been trying to hire a consultant for this important technical support.

119. Sustainability and the potential to upscale FMD control will also require strong political will and commitment. The national strategy document currently being drafted is very important. It will need Government approval at Secretary level in both Federal and Provincial Governments. The commitment of Provincial L&DD Departments will be crucial since they have to implement FMD control strategy.

## 6.5 Impact

120. The project is on track and has contributed to the results stated in the Project Document by improving both farmer livelihoods (through reduced production losses) and food security (by safeguarding milk production). It also makes contributions to FAO's five Strategic Objectives and to the Organizations seven Core Functions.

121. The Project Document states the project Impact as "Control of FMD will improve the livelihood of livestock farmers in the country by curtailing the losses caused by the disease and improving productivity of livestock. This project will contribute to the overall goal of improving food security through an improved on-farm livestock healthcare system." In the parts of the country where it has been most active, the project has already contributed both (i) to improving (or maintaining) livestock farmer livelihoods through curtailing production losses due to FMD and (ii) to food security improvement. These contributions are associated with maintaining milk production by preventing the disease, and with saving the lives of calves that may otherwise die from FMD infection. Household livelihood improvement is associated with financial income from sales of milk and livestock and the safeguarding of livestock assets.

122. The project is making contributions to the FAO's five Strategic Objectives (SO). SO1 is *Help eliminate hunger, food insecurity and malnutrition*. The contribution to food security is described in the preceding paragraph. The project improves people's access to high quality animal protein. It supports and promotes policies and political commitment that effect this through FMD control.

123. SO2 is *Make agriculture, forestry and fisheries more productive and sustainable*. Pakistan has an increasing population and depends on livestock production. The project maintains and helps increase livestock productivity. There is an opportunity, however, to sustain the nutrient resource base of soils. Dung from the hundreds of thousands of urban and peri-urban dairy animals piles up as a pollutant where it could have value to enhance soil fertility. While this does not come under the scope of the project, it certainly does come under this FAO SO.

124. SO3 is *Reduce rural poverty*. Rural poverty is widespread in Pakistan. However, the project appears to interact mainly with the better off and to do little to directly address rural poverty.<sup>30</sup> The project also appears to do little to ensure that smallholder producers are integrated into value chains (SO4 is *Enable inclusive and efficient agricultural and food systems*.)

125. SO5 is *Increase the resilience of livelihoods to disasters*. The project does increase farm resilience to FMD outbreak, which in itself can be a disaster. However, SO5 refers more to natural disasters such as floods and earthquakes and human-mediated disaster such as conflict. There is an opportunity for FAO to do more to protect livestock farmers'

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<sup>30</sup> Project management makes the point that, for output 3 (benefit of preventive vaccination) management deliberately chose smallholder dairy producers. Thus, for preventive vaccination whereas medium and large farmers were 925, around 20 000 smallholders received free preventive vaccination for their animals (>96 000 cattle and buffaloes). Unfortunately, due to security threats and limited time available to the MTR mission, the team was unable to visit areas where vaccination in majority of smallholders was undertaken.

livelihoods from these disasters, for example, through greater uptake of the Livestock Emergency Guidelines and Standards.<sup>31</sup>

126. FAO's seven Core Functions are its means of action to carry out the Organization's work. The project makes contributions to and is consistent with all seven Core Functions.

## **7 Conclusions and Recommendations**

### **7.1 Conclusion**

127. The project concept and design were and remain highly relevant to important needs nationally, regionally and globally. Outputs have been almost entirely achieved with a year of implementation left. This reflects technically sound, visionary, effective and adaptive leadership provided by the Project Coordinator and his team. Effective delivery of outputs has its foundation in robust partnership with the Government at Federal, Provincial/ Regional and District levels. The Government has a clear role in project coordination through its involvement with the TWG and SC. FAO has also leveraged high-level technical support from USDA-FAS and its partners, which has benefitted key stakeholders without drawing on the project budget.

128. The project logical framework facilitates managing the delivery of outputs but not outcome and impact results. Whilst there are clear logical linkages from Activities to Outputs, through Outcome to Impact, but key elements were missing such as a clear outcome statement and no Indicators, Data sources, and Assumptions / risks at outcome and impact level. This hampers the monitoring of high level results and the project team couldn't report the project contribution at Outcome and Impact level.

129. The project has opportunities to be more inclusive and to increase participation of women and poor smallholders but there was no specific targeting of these groups and this is, so far, considered a missing opportunity. The main beneficiaries to date are the larger, commercial farmers and dairies. This has been justified by the epidemiology of FMD virus in Pakistan, which is a particular problem in peri-urban milk production units and buffalo yards. However, FAO has obligations to take a human rights-based approach in its work and to include vulnerable groups. There is published evidence that women have important roles in livestock production in Pakistan. The project has shown that poor farmers may, if there is locally available high quality vaccine, participate in FMD vaccination. Vaccine costs need to be kept as low as possible because high vaccine cost deters farmer compliance.

130. Laboratory capacity building has been effective and vaccine matching, which the project has established, is a very important result. It needs to be maintained after the project. The Project Coordinator considers that NVL will have sufficient resources to continue FMD virus analysis work for two years. The project needs to secure GoP commitment to future funding, for example, by considering costing this component in the National FMD Strategy being drafted.

131. The baseline survey showed that most (87%) farmers are not aware of FMD vaccine. More farmer capacity building is needed and will be a key activity for the remainder of the

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<sup>31</sup> See [www.livestock-emergency.net](http://www.livestock-emergency.net)

project. The quality of training design and delivery can be improved. Training evaluation needs more consideration.

132. The project is enabling the country to move to PCP Stage 2. However, to progress to the next stage would require an aggressive mass vaccination campaign, perhaps for ten to fifteen years. The project has successfully demonstrated that effective vaccination in Pakistan is technically possible. There is a need to reflect where to go from here. How (or whether) to extend vaccination as a biannual mass programme for the vast, at-risk, national herd of cattle, buffaloes and yaks could usefully be discussed at a meeting or conference chaired by the Government.

133. The project needs to provide technical advice on initiatives to produce large quantities of cheaper vaccine in Pakistan. Options for how to provide high quality vaccine sufficient for future national needs, such as, by importation or in-country manufacture, require sound technical recommendations and, again, could be presented at conference.

134. The project advocates a scientifically sound vaccination strategy that maintains a high level of protective immunity in buffaloes, yaks and cattle. This comprehensive strategy has a cost. There is a need to consider how annual vaccination costs can be reduced as much as possible to improve accessibility for poor farmers and to increase national herd immunity. The project is well placed to research these options.

135. The project is carrying out important field trials which may provide evidence of the effectiveness of project-procured vaccine relative to other vaccines in and may also contribute to more understanding on the benefit versus cost of FMD vaccination in large ruminants in various Pakistani systems.

136. FMD outbreak response and sample collection have been carried out effectively under the project with some financial incentive for the field veterinarians. Laboratory testing is also incentivised. It is essential that the project works with the GoP to agree how farm visits, sample analysis and field response will be sustained after the project ends.

137. In conclusion, the project is attaining the planned results. No major, immediate corrective actions are required to ensure delivery of outputs. Project management has considered the priority activities for the remainder of this project's implementation: it will focus on finalizing the national strategy, farmer capacity-building and increased vaccination. These priorities are appropriate. Key contextual areas to consider in future work are: participation and inclusion of vulnerable groups, training (needs analysis, design and evaluation), the future national FMD control system and gaps, and sustainability.

## **7.2 Good practice**

138. Although it is early in the project cycle to draw out "lessons learned", the evaluation has identified three successful, good practices that could be relevant to the design of similar projects. First, with the right selection, a national Project Coordinator (rather than an international Chief Technical Advisor) can effectively manage a FAO project of this type and efficiently lead it to deliver results. Second, the strong partnership that has been developed between the Government and FAO is crucial to enabling efficient project delivery. Third, in a dynamic, endemic setting where there are changing FMD virus serotypes and subtypes, the project has shown the importance of monitoring circulating virus strains and matching these with vaccine procurement specifications.

### 7.3 Recommendations

139. Section 5.3 Gender equality discusses how project management did not consider a gender perspective in FMD control. Section 6.1 Relevance considers the project's fit with the 31st APRC's key recommendations to FAO's regional programme, including, in its Recommendation 1, "increasing the number of female extension workers". If women really do not have a role in FMD control, the project needs to be able to explain this to justify its lack of engagement with women stakeholders. Or, alternatively, if women do have a role, the project needs to re-orientate its activities and outputs. Project management may choose to commission a gender analysis through UN Women. As there is evidence that women have a significant role in livestock farming, there is an opportunity to improve results by working more with women, as well as contributing towards giving women more equitable status.

140. Whilst recognising technical reasons why the project focuses on and is likely to have more results by working with better-off, commercial farmers, a UN project has an obligation to commit to a HRBA that includes participation and inclusion – see section 5.5 Human Rights-Based Approach. To date the project has not made sufficient effort to ensure that a representative number of people, including those whose voices are not normally heard, are actively and meaningfully involved with project implementation. Project management needs to engage poor farmers in discussion of how to improve their access to FMD preventive measures. In this way, the project has potential to make a real difference to poverty and food security of those who may need it most.

#### **Recommendation 1: to FAO and to the FAO Project Team**

FAO should ensure participation and inclusion of women and vulnerable groups during project appraisal and implementation. The project should undertake as soon as possible a focused analysis aiming at improving targeting of women and vulnerable groups. A gender equality specialist should be recruited to study women's roles and whether female trainers/extension workers should lead training for women. Poor smallholders should be meaningfully involved with project implementation including discussion on how to include them in FMD preventive measures.

141. Capacity development was discussed in section 5.4, which identified the lack of TNA and training evaluation and expanded on what a TNA should cover. Before the next round of farmer capacity development/ awareness-raising, project management should carry out participatory Training Needs Assessment and follow up future farmer training/ awareness-raising with a planned, staged evaluation.<sup>32</sup> By going through the processes of systematic needs analysis, training objective setting and training evaluation, the effectiveness of training can be significantly enhanced.

#### **Recommendation 2: to FAO Project Team**

FAO should carry out Training Needs Analysis (TNA) before embarking on further capacity building and training. Training should be followed by assessment of learning and tracking of capacity development. After some time, training results should be evaluated in terms of changes in operational capacity of laboratories. Training material should be modified and updated based on these assessments.

<sup>32</sup> For example, through Kirkpatrick's Four-Level Training Evaluation Model.

142. To ensure continuity of FMD control after the project ends, consideration needs to be given to the scenarios that may exist. The expectation that there will be renewed external funding was highlighted in section 4.1 Project Management. Section 4.1 also discussed the current lack of exit strategy. The proposed conference will provide a forum at which these issues, inter alia, can be discussed and future needs can be more clearly defined. It could usefully consider the questions around quality FMD vaccine including: imported or domestically manufactured vaccine; ensuring NVL's vaccine subtyping capacity for vaccine matching is maintained; and cold chain requirements for an expanded vaccination programme.

143. It was noted in section 5.1 Achievements at Outputs level, that Output 3.5, Evaluation of FMD vaccination effects on productivity in different dairy production systems, is yielding interesting results. These results can contribute to the knowledge base on FMD. With LTU/LTO technical support, the project should analyse the data and write up results for wider dissemination and presentation at the conference. There is potential to do this through collaboration with universities: the data analysis and reporting could be well suited to post-graduate studies. The conference may provide a suitable forum to present findings.

**Recommendation 3: to FAO and Government**

Before the end of the project, a conference, chaired by the Government, should be organised to consider future gaps in the FMD control system and to mobilize regional/international resources to address these gaps.

144. The FMD control system successfully piloted by the project is not sustainable: the surveillance model and vaccination coverage depend on external subsidies and incentives that come from USDA, as discussed in 5.2 Achievements at Outcome level and in 6.4 Sustainability. Commercial farmers are willing to pay for vaccine and there are indications that small farmers will pay for quality vaccine that is locally available. However, to increase coverage and in order to make the project more financially sustainable, vaccination costs must be made as low as possible and vaccination quality must be ensured. By working with the Government to agree a combination of cost-recovery and project-independent payments to veterinary personnel, there is an opportunity to develop a more robust system that can continue to benefit the country, its food security and its farmer livelihoods for years to come.

**Recommendation 4: to FAO Project Team and Government**

Project management should, in the next six months, work with the GoP to develop an operation system to support the veterinary field officers during FMD outbreak control and response work. The operation system will improve the logistical support of field officers to undertake field support in systematic manner. This element should be included in the national control strategy plan and in any future phase of the project.

**Recommendation 5: to FAO Project Team**

Project management should, by the end of 2014, work on improving the project logical framework and impact monitoring. The logical framework should include Indicators, Data sources, and Assumptions / Risks at Outcome and Impact levels. This review should be done in close consultation with Government and partners.



## **Annexes to the evaluation report**

### **Annex 1. Evaluation Terms of Reference**

#### **1. Background of the Project**

1. Foot and Mouth Disease (FMD) is an acute, highly contagious febrile condition of cloven footed animals (cattle, buffaloes, sheep, goats, swine, deer, etc.) characterized by excessive salivation and froth, formation of vesicles in the mouth, inter-digital space in the feet and occasionally on teats and udder. Milk production may drop by 25 to 70 percent and mastitis is a common consequence of the infection. Clinical signs are severer in cattle than buffaloes and sheep and goats usually show milder signs. Exotic cattle and crossbred cattle are particularly susceptible and these animals generally show very severe clinical symptoms and even mortality in many cases. In a mixed herd, the disease will generally appear first in cattle followed by buffaloes and then small ruminants. Young calves are more susceptible and 10 to 22 percent mortality has been reported in young calves and kids.

2. Although FMD virus has seven serotypes namely O, A, C, SAT 1, SAT 2, SAT 3, and Asia-1, only three i.e. A, O and Asia-1 are currently prevalent in Pakistan. Currently the disease is endemic and wide spread in Islamic Republic of Pakistan and occurs throughout the year. In fact FMD is at present the most prevalent and economically the most important infectious disease of livestock in the country.

3. The World Organization for Animal Health (OIE) has the international mandate to certify if an individual country, on the basis of the evidence provided, could be recognized as officially free from FMD with or without vaccination. Recently, the Food and Agriculture Organization of the United Nations (FAO) has put significant efforts in outlining a Progressive Control Pathway (PCP) that is supposed to assist endemic countries in the control of FMD. The PCP recognizes that FMD endemic countries may not necessarily have the ultimate goal of eradicating FMD and may implement control programs aimed at mitigating the impact of FMD in specific productive sectors. The transboundary nature of the disease requires that collaboration and coordination of efforts is put in place between neighbouring countries and, in this regard, different regions across the world have been identified on the basis of homogeneous pools of FMD virus present.

4. The Islamic Republic of Pakistan has an estimated population of FMD-susceptible domestic animals of 33.0 million cattle, 29.9 million buffaloes, 27.4 million sheep, 58.3 million goats and 1.0 million camels. Livestock accounts for 52.2 percent of agriculture value-added and 10.9 percent of the national GDP. Livestock and livestock products are a net source of foreign exchange earnings, constituting more than 8.5 percent of the total exports. Livestock are raised by more than 8.5 million small and landless families in the rural areas and are their main livelihood source. The majority of livestock ownership is smallholdings and subsistence agriculture.

5. Realizing the importance of FMD in the country, control of the disease has been discussed on various forums in the country. However, no national control program was ever

launched. A serious effort in this regard was made when Government of Islamic Republic of Pakistan identified FMD as the priority livestock disease for its control in trilateral meeting involving USA, Pakistan and Afghanistan in January 2010 in Doha. During the meeting, Animal Husbandry Commissioner representing Pakistan stressed the importance of control of this disease for Pakistan and international community and the USDA representatives agreed to look into. Following this meeting a trilateral seminar (involving USA, Pakistan and Afghanistan) was held in Islamabad on 16-17 February 2010 within the framework of a strategic dialogue of USA-Pakistan. This seminar recommended formulation of a FMD control project.

6. Based on a US mission from USDA in 2010, a program agreement was signed in September 2010 with FAO entitled “Support to FAO to increase sustainable livestock production” which also includes the current project GCP/PAK/123/USA entitled Progressive Control of Foot and mouth disease in Pakistan.

7. The development goal of this initiative is to improve livestock productivity through control of Foot and Mouth Disease (FMD) for increasing economic growth and reducing poverty particularly in rural areas of Pakistan.

### **1.1 Project information:**

8. The project “Support to Increase Sustainable Livestock Production” was signed between USDA and FAO in September 2010, but the project actually started in August 2011 and should be finalized in 30 September 2015. Project total budget is US\$7,140,500

9. The project was designed in consultation with main stakeholders i.e. Provincial / Regional Livestock and Dairy Development Departments and Animal Husbandry Commissioner Ministry of National Food Security and Research.

10. The evaluation period is August 2011 to June 2014. The project is being implemented throughout Pakistan with activities in output 3 restricted to pilot areas. The project is being implemented in close collaboration of all Provincial / Regional Livestock and Dairy Development Departments. Field activities are undertaken by the staff of the provincial / regional livestock departments.

11. **Project main objective** Control of FMD will improve the livelihood of livestock farmers in the country by curtailing the losses caused by the disease and improving productivity of livestock. This project will contribute to the overall goal of improving food security through an improved on-farm livestock healthcare system.

### **1.2 The project's outcome:**

12. Progressive control of FMD in Pakistan effectively implemented.

13. The project is targeting the improvement of on-farm livestock healthcare system through:

- Strengthen capacity of districts, provincial and reference laboratories in Pakistan to diagnose FMD at disease, serotype and genotype level.
- Improve surveillance of FMD and response to FMD outbreaks in the country.
- Demonstrate benefits of early and consistent immunization practices for effective control of FMD in different livestock production systems.

### 1.3 *The project outputs:*

- Output 1: Capacity to diagnose FMD at disease, serotype and genotype level enhanced in districts and provincial and reference laboratories.
- Output 2: Surveillance of FMD and response to FMD outbreaks in the country enhanced.
- Output 3: Benefits of preventive early and consistent immunization practices demonstrated for effective control of FMD.

## 2. **Purpose of the Evaluation**

14. This mid-term evaluation was foreseen in the project document. The purpose of the Evaluation is to inform the Project Task Force (PTF), the Government of Islamic Republic of Pakistan, FAO, the USDA donor and other stakeholders about the project's progress and performance towards attaining the expected outputs and outcomes. The evaluation will draw specific conclusions and formulate recommendations for any necessary further action by PTF, Government, FAO and/or other parties. The evaluation may also identify specific good practices and lessons to be learned for the formulation and execution of other similar projects. The evaluation may contribute to identify corrective actions if necessary.

## 3. **Evaluation framework**

### 3.1 *Scope*

15. The independent Mid-Term Evaluation will evaluate the first three years of project implementation until June 2014. It will determine progress being made towards the achievement of project outcomes and will identify corrective actions if necessary. It will assess the project from its concept and design to current and potential results at both outcome and output levels. Project activities cover Provincial / Regional Livestock and Dairy Development Departments and Animal Husbandry Commissioner Ministry of National Food Security and Research.

### 3.2 *Evaluation criteria*

16. The project will be critically assessed through the internationally accepted evaluation criteria, i.e. relevance, efficiency, effectiveness, impact, and sustainability. In line with the new FAO project cycle, the evaluation will assess compliance with the following UN Common Country Programming Principles: Human Rights Based Approaches (HRBA)/ Right to Food/ Decent Work; Gender equality, Environmental sustainability, Capacity Development and Results Based Management.

### 3.3 *Evaluation issues*

- I. Relevance of concept and design
  - a. Project relevance to: national/regional development priorities programmes, needs of the population; UNDAF UN programming framework; national, regional and international needs for the control of FMD; FAO Country Programming Framework (CPF); FAO Global Goals and Strategic Objectives/Core Functions; other aid programmes in the sector;

- b. Project design: its adequacy for the country social, financial and political environment as well as the human and financial resources approved to the project;
- c. Robustness and realism of the theory of change underpinning the project;
- d. Clarity, coherence and realism of the Logical Framework<sup>33</sup> of the project and of its design, including:
  - The causal relationship between inputs, activities, outputs, expected outcomes (immediate objectives) and impact (development objectives);
  - Validity of indicators, assumptions and risks;
  - Approach and methodology;
  - Resources (human and financial) and duration;
  - Stakeholder and beneficiary identification and analysis; and
  - Institutional set-up and management arrangements.

## II. Effectiveness of outputs and outcomes

- a. Overall effectiveness of the project, actual or potential, in attaining its intermediate/specific objectives;
- b. Description and analysis of the outputs produced, in terms of quantity, quality and timeliness;

17. Key output level achievements reported that the evaluation will describe and analyze include:

- *Capacity to diagnose FMD at serotype & genotype level enhanced;*  
fully functional 8 diagnostic labs undertaking serotyping of FMD virus, PCR (conventional & real time) and virus isolation operational at NVL, 1212 field vets trained in FMD epidemiology & outbreak control in 40 training workshops in various cities, sample collection kits provided to 920 field vets, 27 vets from 10 Labs provided 15 days training in ELISA for FMD diagnosis. Refresher trainings on ELISA and regular technical back-stopping of provincial ELISA labs, NVL successfully participated in Proficiency testing programme, LIMS developed successfully and being implemented in Veterinary diagnostic labs.
- *surveillance of and response to FMD outbreaks improve;*  
92 farmers' awareness seminars held involving 3473 livestock keepers; 19,320 posters and brochure distributed; livestock shows, conferences and electronic media, study visit of Turkey by 18 Senior Management of livestock departments in 2012, 3889 FMD outbreaks recorded; serotype O 46.3 percent, serotype A 42.6 percent and serotype Asia-1 11 percent, standard Operating Procedure for handling FMD outbreak developed; 920 treatment kits given to field vets; positive response from the farmers, surveillance model for FMD developed, Quarterly "Pakistan FMD Bulletin" published.
- *Benefits of early and consistent immunization demonstrate;*  
Experts Committee for identifying strains for FMD vaccine established, vaccine banks functional at Islamabad, Peshawar, Lahore, Karachi, Hyderabad, Quetta and Gilgit, on-going vaccination trial in 9 dairy colonies involving 72196 animals provided excellent protection in vaccinates for last two years, vaccination trial in smallholder dairy production in rural areas gave excellent protection in 96507 cattle and buffaloes of 19143 farmers from 145 villages in 22 districts in all provinces and

<sup>33</sup> The Logical Framework embodies the Results-Based Management approach in a project

- regions of the country, successful vaccination program demonstrated at 28 government livestock farms having 10689 animals.
- c. Use made by the project of FAO's normative and knowledge products and actual and potential contribution of the project to the normative and knowledge function of the Organization. Achievements and gaps in project execution: taking into consideration time frame, government administration structure, availability of national partners and communication facilities in the rural areas.
  - d. The analysis should expand to assess the correlation and integration between the project and past/current regional initiatives on progressive control of FMD.

### III. Efficiency and effectiveness of project implementation process

- a. Assessment of project management:
  - Quality, realism and focus of work plans;
  - Assessment of delivery, causes and consequences of delays and of any remedial measure taken, if any;
  - Monitoring and feed-back loop into improved management and operations;
  - Staff management; and
  - Development and implementation of an exit strategy
  - Implementation arrangements: assess the practicality of the designed implementation arrangements within the government counterpart institution and its compatibility with FAO structure.
- b. Institutional Setup:
  - Administrative and technical support by FAO HQ, regional, sub-regional and country office, as appropriate;
  - Institutional set-up, internal review processes, coordination and steering bodies; and
  - Inputs and support by the Pakistan Government and resource partner (s).
- c. Assessment of financial resources management, including:
  - Adequacy and realism of budget allocations to achieve intended results;
  - Adequacy and realism of Budget Revisions in matching implementation needs and project objectives; and
  - Rate of delivery and budget balance at the time of the evaluation and in relation to work-plans.

### IV. Analysis of the application of the UN common country programming principles, cross-cutting themes.

- a. Analysis of gender mainstreaming for gender equality. This will include:
  - extent to which gender equality considerations were reflected in project objectives and design to address the needs, priorities and constraints of both women and men, and in the identification of beneficiaries;
  - Extent to which gender equality considerations were taken into account in project implementation and management; and
  - Extent to which gender relations and equality have been or will be affected by the project.<sup>34</sup>
- b. Analysis of the Capacity Development dimension in the design, implementation and results of the project, at individual, organizational and enabling environment levels.<sup>35</sup>

<sup>34</sup> See: [http://typo3.fao.org/fileadmin/templates/gender/docs/FAO\\_FinalGender\\_Policy\\_2012.pdf](http://typo3.fao.org/fileadmin/templates/gender/docs/FAO_FinalGender_Policy_2012.pdf)

This will include on FMD monitoring and diagnostic system and response mechanism.

- c. Analysis of the adoption of the Human-Rights Based Approach, namely:
  - the integration of the Right to Food dimension and principles, in the design, implementation and results of the project;
  - The integration of decent rural employment concerns in the design, implementation and results of the project.
- d. Analysis of Partnerships and Alliances, namely:
  - How they were planned in the project design and developed through implementation;
  - Their focus and strength; and
  - Their effect on project results and sustainability.<sup>36</sup>
- e. Analysis of how environmental impacts were taken into consideration and addressed, following the steps and criteria contained in the FAO Environmental Impact Assessment guidelines.

## V. Impact

- a. Overall impact of the project, actual or potential, positive and negative, produced directly or indirectly, intended or unintended; and
- b. Overall contribution of the project to FAO Country Programming Frameworks, Organizational Result/s and Strategic Objectives, as well as to the implementation of the corporate Core Functions.

## VI. Sustainability

- c. The prospects for sustaining and up-scaling the project's results by the beneficiaries and the host institutions after the termination of the project i.e. the veterinary service of the provinces and federal government. The assessment of sustainability will include, as appropriate:
  - Institutional, technical, social and economic sustainability of proposed technologies, innovations and/or processes;
  - Expectation of institutional uptake and mainstreaming of the newly acquired capacities, or diffusion beyond the beneficiaries or the project; and
  - Environmental sustainability: the project's contribution to sustainable natural resource management, in terms of maintenance and/or regeneration of the natural resource base.

18. Based on the above analysis, the evaluation will draw specific conclusions and formulate recommendations for any necessary further action by Government, FAO and/or other parties to ensure sustainable development, including any need for follow-up or up-scaling action. The evaluation will draw attention to specific good practices and lessons to be learned as they are of interest to other similar activities.

<sup>35</sup> See: <http://www.fao.org/capacitydevelopment/en/>

<sup>36</sup> See: <http://www.fao.org/partnerships/partners-home/en/>

## **4. Evaluation methodology**

### **4.1 Approach and tools**

19. The evaluation will adhere to the UNEG Norms & Standards<sup>37</sup>.
20. The evaluation will adopt a consultative and transparent approach with internal and external stakeholders throughout the evaluation process. Triangulation of evidence and information gathered will underpin its validation and analysis and will support conclusions and recommendations.
21. The evaluation will make use of the following methods and tools: review of existing reports, semi-structured interviews with key informants, stakeholders and participants, supported by check lists and/or interview protocols; direct observation during field visits; surveys and questionnaires.
22. Particular attention will be devoted to ensure that women and other under-privileged groups will be consulted in adequate manner. Insofar as possible and appropriate, interaction will also take place with non-participants to canvass their opinions.

### **4.2 Stakeholders and consultation process**

23. The evaluation team will discuss in detail with the key stakeholders of the project and will take into account their perspectives and opinions. Key stakeholders will include:
  - Project Task Force members;
  - The Federal Ministry of Livestock and Dairy Development;
  - Local staff of livestock departments and the veterinary service of the provinces and federal government and civil society organizations - in particular women; and Participants in project activities farmers, field veterinary staff both public and private, diagnostic lab staff, NUST collaborators.
  - FAO representative in the country

## **5. Roles and responsibilities**

24. FAO Budget Holder (BH), the Lead Technical Officer (LTO) and the Project Task Force (PTF) of the project to be evaluated are responsible for initiating the evaluation process, drafting the first version of the Terms of Reference, and supporting the evaluation team during its work. They are required to participate in meetings with the team, make available information and documentation as necessary, and comment on the draft final terms of reference and report. Involvement of different members of the project Task Force will depend on respective roles and participation in the project.
25. The BH is also responsible for leading and coordinating the preparation of the FAO Management Response and the Follow-up Report to the evaluation, fully supported in this task by the LTO and PTF. FAO Office of Evaluation (OED) guidelines for the Management Response and the Follow-up Report provide necessary details on this process.

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<sup>37</sup> United Nations Evaluation Group, <http://www.uneval.org/normsandstandards>

26. FAO Office of Evaluation assists the BH and LTO in drafting the ToR, in the identification of the consultants and in the organization of the team's work; it is responsible for the finalization of the ToR and of the team composition;<sup>38</sup> it shall brief the evaluation team on the evaluation methodology and process and will review the final draft report for Quality Assurance purposes in terms of presentation, compliance with the ToR and timely delivery, quality, clarity and soundness of evidence provided and of the analysis supporting conclusions and recommendations.

27. The Office of Evaluation has also a responsibility in following up with the BH for the timely preparation of the Management Response and the Follow-up to the MR.

28. The Evaluation Team is responsible for conducting the evaluation, applying the methodology as appropriate and for producing the evaluation report. All team members, including the Team Leader, will participate in briefing and debriefing meetings, discussions, field visits, and will contribute to the evaluation with written inputs for the final draft and final report.

29. The Team Leader guides and coordinates the team members in their specific work, discusses their findings, conclusions and recommendations and prepares the final draft and the final report, consolidating the inputs from the team members with his/her own.

30. The Evaluation team will be free to expand the scope, criteria, questions and issues listed above, as well as develop its own evaluation tools and framework, within time and resources available.

31. The team is fully responsible for its report which may not reflect the views of the Government or of FAO. An evaluation report is not subject to technical clearance by FAO although OED is responsible for Quality Assurance of all evaluation reports.

32. As a contribution to the OED Knowledge Management System:

- the Team Leader will be responsible for completing the OED quantitative project performance questionnaire, to be delivered at the same time with the final evaluation report; OED will ask all team members to complete an anonymous and confidential questionnaire to get their feedback on the evaluation process.

33. The donor has requested to participate in this mission as an observer, OED has accepted; however it should be clearly understood that the donor is not expected to participate in the conduction of the evaluation process, influence or interfere with the way OED, FAO carry out the process.

34. For further details related to the tasks of the Team leader and team members, please refer to template ToRs provided in annex.

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<sup>38</sup> The responsibility for the administrative procedures for recruitment of the team, will be decided on a case-by-case basis.



## **6. Evaluation team**

35. Mission members will have had no previous direct involvement in the formulation, implementation or backstopping of the project. All will sign the Declaration of Interest form of the FAO Office of Evaluation.

36. The evaluation team will comprise the best available mix of skills that are required to assess the project, and as a whole, will have expertise in all the following subject matters:

- Evaluation, a veterinary degree and experience on PC FMD processes, working in the region on animal health projects. Familiar with veterinary service set-up in the developing countries particularly of the region. In addition to Food security, small scale production and familiar with FAO structure.

37. Furthermore, to the extent possible, the team will be balanced in terms of geographical and gender representation to ensure diversity and complementarity of perspectives.

## **7. Evaluation deliverables**

38. The evaluation report will illustrate the evidence found that responds to the evaluation issues, questions and criteria listed in the ToR. It will include an executive summary. Supporting data and analysis should be annexed to the report when considered important to complement the main report.

39. The recommendations will be addressed to the different stakeholders and prioritized: they will be evidence-based, relevant, focused, clearly formulated and actionable.

40. The evaluation team will agree on the outline of the report early in the evaluation process, based on the template provided in Annex I of this ToR. The report will be prepared in English, with numbered paragraphs, following OED template for report writing. Translations in other languages of the Organization, if required, will be FAO's responsibility.

41. The team leader bears responsibility for submitting the final draft report to FAO within two to three weeks from the conclusion of the mission. Within one week, FAO will submit to the team its comments and suggestions that the team will include as appropriate in the final report within maximum two weeks.

42. Annexes to the evaluation report will include, though not limited to, the following as relevant:

- Terms of reference for the evaluation;
- Profile of team members;
- List of documents reviewed;
- List of institutions and stakeholders interviewed by the evaluation team;
- List of project outputs;
- Evaluation tools.

## **8. Evaluation timetable**

43. The evaluation is expected to take place during August to November 2014. The country visit phase is expected to last approximately 2 weeks. The timetable in the box below shows a tentative programme of travel and work for the evaluation team

Tentative timetable of the evaluation

Task	Dates	Duration	Responsibility
ToR finalization			PTF/OED
Team identification and recruitment		2 weeks	OED
Mission organization		5 days	OED/PTF
Reading background documentation		5 days	Mission members
Briefing		2 day	Skype discussions with Rome OED/TCSR
Travel		1 day	OED
Mission to Pakistan		10day -2 weeks	PTF FAO Rep
Report Writing		8 days	

## **Annex 2. Brief profile of evaluation team members**

**Team Leader:** David Hadrill, BVSc MSc MRCVS. David Hadrill is an independent veterinary consultant with wide experience of animal health in development and emergency/disaster relief. He has worked long-term in India, Somalia, the West Indies (St Kitts and Nevis), Mongolia and Ethiopia and carried out shorter assignments in many countries in Asia, Africa, the Caribbean and Europe. He has consulted for FAO, EU, DFID, World Bank and Asian Development Bank and international NGOs, specializing in transboundary animal disease control, disaster relief, project management and evaluation. He has a key role in the LEGS (Livestock Emergency Guidelines and Standards) Project as a focal point author, trainer and Steering Group member. He made recommendations to FAO on foot-and-mouth disease vaccine use in the Lower Mekong Zone of the SE Asia FMD control region, visiting Cambodia, Thailand and Lao PDR. He advised FAO on project implementation for FMD control and surveillance in endemic Provinces of Eastern Anatolia, Turkey.

Bachelor of Veterinary Science, University of Bristol; Master of Science (Tropical Veterinary Medicine), University of Edinburgh; registered Member of Royal College of Veterinary Surgeons; a Director of Vetwork UK; Member of the British Veterinary Association Overseas Group. Email: djhadrill@btinternet.com

**National Consultant:** Sajjad Zaheer, BVSc, BSc, MSc Sajjad Zaheer is an independent consultant. He was Director General (Extension) of the Punjab Livestock and Dairy Development Department and had over 40 years service in the public sector with the Government of Punjab, Pakistan until 2008. He has broad experience in animal health, livestock and dairy development.

During his public service and subsequently as national consultant he has worked with various international projects in Pakistan. These include projects funded by GTZ (Strengthening the Planning Capabilities of Livestock Department, 1992-97 and 2000), the EU (Strengthening of Livestock Services, 2003-08), ADB (Marketing Infrastructure Project, 2010) and USAID (Agriculture Support Information Plan, 2011).

Bachelor of Veterinary Sciences and Bachelor of Sciences (Animal Husbandry), University of Punjab; Master of Science (Microbiology), University of Agriculture Faisalabad; life member of Pakistan Veterinary Medical Association and Pakistan Veterinary Medical Council. Email: sajjadzaheer@hotmail.com

**Annex 3. List of documents reviewed**

FAO	Annual Work Plans for 2012, 2013 and 2014
FAO (2004)	Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security
FAO (2010)	GCP/PAK/123/USA Project Review Sheet
FAO (2010)	Programme Agreement between the United States Department of Agriculture, Foreign Agriculture Service and FAO for Support to Increase Sustainable Livestock Production, GCP/PAK/123/USA
FAO (2011)	Project Document GCP/PAK/123/USA
FAO (2012)	Country Programming Framework within a ‘Delivering as One UN’ Context
FAO (2012)	Key recommendations for action by FAO APRC and FAO’s Actions in PWB 2012-13, in: <i>Report on Implementation of the 31<sup>st</sup> APRC Key Recommendations for FAO’s Action related to Regional Priority Framework and Achievement of Organizational Outputs (OOs) of RA and SAP for PWB 2012-13</i>
FAO (2012)	Memorandum of Understanding between FAOR and Animal Health Programme, Animal Sciences Institute, National Agricultural Research Centre, Islamabad
FAO (2012)	Standard Operating Procedure for National Veterinary Laboratories, Islamabad to Undertake Activities of the Project
FAO (2012)	Terminal Report, GTFS/INT/907/ITA, Controlling Transboundary Animal Diseases in Central Asian Countries
NARC (2014)	Baseline Survey of Project Control of FMD Project in Pakistan, Social Sciences Research Institute, National Agricultural Research Centre (NARC), Islamabad.
OCHR (2006)	Report on Indicators for Monitoring Compliance with International Human Rights Instruments
SC (2012)	Minutes of the Steering Committee Meeting held on 21 January 2012 at Pearl Continental Hotel, Bhurbon.
SC (2012a)	Minutes of Second Meeting of the Steering Committee under the Project, “Progressive Control of Foot-and-Mouth Disease in Pakistan” (GCP/PAK/123/USA) held on Thursday May 24, 2012 at Noor Mahal Hall, Marriott Hotel, Islamabad.
SC (2013)	Minutes of the Third Meeting of the Steering Committee held on 19 February 2013 at Ambassador III, Marriott Hotel, Islamabad
SC (2014)	Minutes of Fourth Meeting of the Steering Committee was held on 06 January 2014 at Ambassador Hall, Marriott Hotel, Islamabad
TWG (2011)	Minutes of the Meeting, “Technical Working Group” held on Saturday 24 September 2011 at National Veterinary Laboratories, Islamabad.

TWG (2012)	Minutes of 2 <sup>nd</sup> Meeting of The Technical Working Group of Progressive Control of Foot and Mouth Disease In Pakistan at Best Western Hotel, Islamabad on 13 April 2012.
TWG (2012a)	Minutes of the Third meeting of the Technical Working Group (TWG) held on 06 December 2012 at Crystal Ball Room, Marriott Hotel, Islamabad.
TWG (2013)	Minutes of the Fourth Meeting of the Technical Working Group held on 27 November 2013 at Crystal Ball Room, Marriott Hotel, Islamabad.
UN (2009)	One UN Program in Pakistan
UNDP (2012)	Mainstreaming Human Rights in Development – Policies and Programming: UNDP Experiences

**Annex 4. List of institutions and stakeholders met during the evaluation process****Key institutions met with and visited**Islamabad

National Veterinary Laboratories  
 FAO Representation  
 United States Department of Agriculture

Sindh

Government Veterinary Hospital and Laboratory, Landhi Cattle Colony, Karachi  
 Karachi Dairy Farmers Association  
 Nagori Dairy Society, Karachi

Khyber Pakhtunkhwa (KPK)

Livestock and Dairy Development (L&DD) Department, Peshawar  
 Veterinary Research Institute, Peshawar

Punjab

L&DD Department, Lahore, Punjab  
 FMD Research Centre, Lahore  
 Rakh Chandrai Dairy Colony, Lahore  
 Research Centre for Conservation of Sahiwal Cattle, Jhang  
 District Veterinary Hospital, Maloana Turn, Jhang

**Key stakeholders met and consulted**USDA

- Ian C Winborne, Plant Health Advisor, Animal and Plant Health Inspection Service (APHIS), Foreign Agricultural Service, Islamabad
- Asmat Raza, Senior Agricultural Specialist, Foreign Agricultural Service, Islamabad

FAO Islamabad, project team GCP/PAK/123/USA

- Patrick T Evans, FAO Representative
- Dr Mohammad Afzal, Project Coordinator
- Dr Manzoor Hussain, National Project Director
- Ehtisham Ul Haq Khan, National Field Officer (Epidemiology)
- Dr Muhammad Javed Arshad, National Field Officer (Diagnosis)
- Dr Shumaila Manzoor, Laboratory Technologist (ELISA)
- Dr Aatka Jamil, Laboratory Technologist (Cell Culture)
- Kahkhashan Jabeen, Laboratory Technologist (PCR)
- Dr Nasrullah Panhwer, National Field Officer, Sindh
- Dr Aftab Ahmad, National Field Officer, Vaccination, KPK

FAO HQ

- Giancarlo Ferrari, Animal Health Consultant, FMD Expert

Government of Islamic Republic of Pakistan

- Dr Qurban Ali, Director General National Veterinary Laboratories, acting Chief Veterinary Officer (CVO)/ Animal Husbandry Commissioner
- Dr R H Usmani, Animal Husbandry Commissioner and CVO (retired April 2014)
- Dr Khurshid, Principal Scientific Officer, National Veterinary Laboratory (NVL)

- Dr Muhammad Abubakar, Scientific Officer, NVL
- Dr Abdul Hafeez Shaikh, Deputy Director, Livestock/Animal Husbandry, Karachi
- Mr Ishan Ullah, Acting DG L&DD Dept (Extension) and TAD Officer, Khyber Pakhtunkhwa, Peshawar
- Dr Ghufuran Ullah, DG, L&DD Dept (Research), Khyber Pakhtunkhwa, Peshawar
- Mr Nawas Saeed, DG (Extension), L&DD Dept, Lahore, Punjab
- Dr Arshad Mahmood, Additional Principal Veterinary Officer (APVO)/ TAD Officer, L&DD Dept, Lahore, Punjab
- Dr Khalid Mahmood Khan, Director Livestock Farms, L&DD Dept, Lahore, Punjab
- Dr Khaliq Shafi, Director, Directorate of Disease Reporting and Surveillance, L&DD Dept, Lahore, Punjab
- Dr Abbas Ali, Epidemiologist (resource person for LIMS), L&DD Dept, Lahore, Punjab
- Dr Farhad Awan, Head of Lahore District Diagnostic Laboratory, Punjab
- Dr Muhammad Iqbal, APVO, Additional Director, FMD Research Centre, Lahore, Punjab
- Dr Shabir Ahmad, Research Officer, Veterinary Research Institute, Lahore
- Dr Javed Iqbal, Director, Research Centre for Conservation of Sahiwal Cattle, Jhang
- Dr Ghulam Mohammad Gill, Director Smallholders, Gujranwala and Jhang
- Dr M Shafqat, Veterinary Officer, Maloana, Jhang

#### Project Partners

- Dr Saad Qaiser, Principal Investigator, Livestock Management Information System (LIMS)
- Mohammad Salman, Software Developer for LIMS, based at NUST

#### Farmers and livestock owners

##### *Sindh, Karachi*

- Shaukat Mukhtar, Joint Secretary, Karachi Dairy Farmers Association
- Muhammad Anser, Executive Committee Member, Karachi Dairy Farmers Association
- Jameel Memon, 3 500 bovines (70% buffalo, 30% cattle), Vaccinated by the project

##### *Sindh, Landhi (Karachi)*

- Mr Doda Khan, 100 (buffalo), Vaccinated by the project
- Mr Ansar, 420 (buffalo and cattle), Vaccinated by the project
- Shakir Umar (cattle trader), 25 buffalo, Not vaccinated

##### *Sindh, Nagori (Karachi)*

- Qari Shaukat, 200 (buffalo), Vaccinated by the project
- Mr. Faizan, 75, Vaccinated by the project on cost sharing basis
- Haji Rasheed, 212 (buffalo), Vaccinated by the project

##### *Khyber Pakhtunkhwa (KPK), Dairy colony, Peshawar*

- Haji Iliyas, 105 head, Vaccinated by the project
- Haji Neemat, 42, Vaccinated by the project
- Shakar Khan, 14, Vaccinated by the project
- Nagar Khan, 30, Vaccinated by the project
- Muhammad Ali Khan, 12, Vaccinated by the project
- Asif Khan, 20, Vaccinated by the project
- Taj Mohammad, 13, Vaccinated by the project
- Hidayat Khan, 13, Vaccinated by the project

*Punjab, District Lahore, Rakh Chandrai Dairy colony*

- Ch. Rasheed, 120 (cattle and buffalo), Vaccinated by the project
- Bashir Ahmad, 220 (buffalo), Vaccinated by the project
- Mr Aslam, 115 (buffalo), Vaccinated by the project
- Muhammad Hayyat, 125 (cattle and buffalo), Vaccinated by the project
- Mr. Tariq, 195 (cattle and buffalo), Vaccinated by the project
- Noor Mohammad, 150 (buffalo), Not vaccinated
- Ali Raza, 100 (buffalo), Not vaccinated
- Latif, 50 buffalo, Not vaccinated

*Punjab, District Lahore, Warraich village*

- Abid Masood (Cow Company Ltd), 110 (cross bred) 10 buffalo. Treated and vaccinated with project support following July 2014 FMD outbreak.

*Punjab, District Lahore, Haveli cheetu wali*

- Azmat Ali and brothers, 12 (6 cattle, 6 buffalo), Not under regular project vaccination

*Punjab, District Jhang, Malhoana*

- Sajjad Akbar, 45 (cross-bred cattle), Vaccinated by the project

*Punjab, District Jhang, Bakhaywala Malhoana*

- Mohammad Ramazan, 22 buffalo, Vaccinated by the project
- Haji Mohammad, 25 buffalo, Vaccinated by the project
- Mohammad Tanveer, 7 buffalo, Vaccinated by the project

*Punjab, District Jhang, Mehranwala Malhoana*

- Mohammad Khan, 25 buffalo, 5 cattle, Not under regular project vaccination
- Sardool Ahmad, 12 buffalo, 3 cattle, Not under regular project vaccination
- Umar Daraz, 5 buffalo, Not under regular project vaccination

*Punjab, District Sargodha, Chak 97 colony (site of project-supported FMD outbreak response)*

- Mohammad Khan, 3 buffalo, Not under regular project vaccination
- Mohammad Mansha and his brothers, 9 buffalo, Not under regular project vaccination

*Punjab, District Sargodha, Chak 97 Dakahlee*

- Khalil Ahmad Cheema, 11 (8 cross bred cattle, 3 buffalo), Not under regular project vaccination
- Naveed Cheema, 9 Buffalo, 6 cross bred cattle, Not under regular project vaccination
- Manzoor Ahmad, 3 Buffalo, 3 cattle, Not under regular project vaccination

*Punjab, District Sargodha, Chak 97 SB*

- Mohammad Mohsin, 6 buffalo, Not under regular project vaccination
- Rizwan Tariq, 1 cattle, 1 buffalo, Not under regular project vaccination

*Punjab, District Sargodha, Chak 95 S*

- Zuliqar Ahmad, 18 buffalo, 4 cattle, Not under regular project vaccination
- Asif, 25 buffalo, 25 cattle, Not under regular project vaccination



## Annex 5. List of project outputs

### 1. Farmer FMD Awareness Meetings

No.	Province	Location	Participants
1	Punjab	Sargodha	21
2	Azad Jammu Kashmir	Mirpur	15
3	Punjab	Lahore	78
4	Punjab	Lahore	55
5	Punjab	Jhang	42
6	Punjab	Jhang	67
7	Khyber Pakhtunkhwa	Peshawar (1)	50
8	Khyber Pakhtunkhwa	Swat (1)	54
9	Khyber Pakhtunkhwa	Batkhela (1)	56
10	Khyber Pakhtunkhwa	Dir Lower	56
11	Khyber Pakhtunkhwa	Dir Lower	60
12	Khyber Pakhtunkhwa	Dir Lower	45
13	Khyber Pakhtunkhwa	Dir Lower	50
14	Azad Jammu Kashmir	Muzaffarabad	28
15	Azad Jammu Kashmir	Muzaffarabad	32
16	Azad Jammu Kashmir	Muzaffarabad	18
17	Azad Jammu Kashmir	Muzaffarabad	12
18	Azad Jammu Kashmir	Mirpur	28
19	Azad Jammu Kashmir	Mirpur	33
20	Azad Jammu Kashmir	Mirpur	38
21	Azad Jammu Kashmir	Mirpur	32
22	Baluchistan	Quetta	15
23	Baluchistan	Quetta	20
24	Baluchistan	Quetta	15
25	Sindh	Thatta	48
26	Sindh	Naushehroferoz	68
27	Punjab	Attock	32
28	Punjab	Jhang	53
29	Gilgit	Ghizer	24
30	ICT	Islamabad	47
31	KPK	Abbotabad	60
32	Azad Jammu Kashmir	Mirpur	23
33	Azad Jammu Kashmir	Pakhral (Mirpur)	22
34	Azad Jammu Kashmir	Ternoti (Rawalakot)	30
35	Sindh	Mitairi	55
36	Sindh	Tando Allahyar	62
37	Punjab	Rahim Yar Khan	22
38	Punjab		25
39	Punjab		13
40	Punjab	Jhang	35
41	Punjab		33
42	Baluchistan	Quetta	10
43	Khyber Pakhtunkhwa	Nowshera (Pashtun Gharri	48
44	Khyber Pakhtunkhwa	Nowshera ( Dag Behsud	47
45	Azad Jammu Kashmir	Mirpur (Dadyal	35
46	Azad Jammu Kashmir	Mirpur (Khdimabad	34
47	Azad Jammu Kashmir	Mirpur (Thara	30
48	Azad Jammu Kashmir	Mirpur (Bangrela	50

No.	Province	Location	Participants
49	Azad Jammu Kashmir	Mirpur (Kanali	40
50	Azad Jammu Kashmir	Mirpur (Chakswari	25
51	Azad Jammu Kashmir	Bhimber (Punjeeri	47
52	Azad Jammu Kashmir	Bhimber (Burnala	82
53	Azad Jammu Kashmir	Bhimber	42
54	FATA	Mohmand Agency (Prang Ghar)	32
55	FATA	Mohmand Agency (Nawan Killi)	35
56	FATA	Mohmand Agency (Nao)	38
57	Sindh	Karachi	45
58	Khyber Pakhtunkhwa	Dairy Colony Peshawar	44
59	Khyber Pakhtunkhwa	Pashtun Ghari, Nowshera	43
60	Khyber Pakhtunkhwa	CVH Haripur	49
61	Khyber Pakhtunkhwa	Abbotabad	34
62	Azad Jammu Kashmir	Muzaffarabad	18
63	Azad Jammu Kashmir	Mirpur	15
64	Azad Jammu Kashmir	Samhani (63), Bhimber (25)	88
65	FATA	Sahibabad Bajour Agency	33
66	FATA	Haji lawang Bajour Agency	40
67	Sindh	Thatta	40
68	Sindh	Matiori	50
69	Sindh	Nausheroferoze	59
70	Sindh	LCC, Karachi	30
71	Sindh	Karachi	28
72	Khyber Pakhtunkhwa	Swat	75
73	Khyber Pakhtunkhwa	Swat	72
74	Gilgit	Ghizer	28
75	Punjab	Bahawalpur (Nawan Khu)	12
76	Punjab	Bahawalpur (Daulo Jamal)	10
77	Punjab	Bahawalpur (Kala Paar)	8
78	Punjab	Bahawalpur (Naichan Wala)	7
79	Punjab	Bahawalpur (Bara)	10
80	Punjab	(Rahim Yar Khan) Sadhay Wala	8
81	Punjab	(Rahim Yar Khan) Lakhay Wala	6
82	Punjab	(Rahim Yar Khan) Hiklia	15
83	Punjab	Bahawalpur	18
84	Khyber Pakhtunkhwa	Batagram	77
85	Khyber Pakhtunkhwa	Abbottabad	55
86	Khyber Pakhtunkhwa	Mardan	74
87	Khyber Pakhtunkhwa	D I Khan	48
88	Baluchistan	Pishin	32
89	Baluchistan	Quetta	36
90	Baluchistan	Lasbella	28
91	Baluchistan	Naseerabad, JhalMagsi	50
92	FATA	FR DI Khan	37
93	Punjab	Multan	52
94	Punjab	Lahore	20
95	Punjab	Bahawalpur	96
96	Sindh	Karachi	120
97	KPK	Swabi	52
98	Baluchistan	Quetta	30
99	Punjab	Rahim Yar Khan	30
100	Punjab	Vehari	25

No.	Province	Location	Participants
101	FATA	FR Kohat	53
102	Khyber Pakhtunkhwa	Dir Lower	105
103	Khyber Pakhtunkhwa	Dir Upper	65
104	Khyber Pakhtunkhwa	Tor Ghar	60
105	Khyber Pakhtunkhwa	Kohistan	78
106	Khyber Pakhtunkhwa	Tank	95
107	Khyber Pakhtunkhwa	Lakki Marwat	92
108	Gilgit	Sakardu	24
109	Gilgit	Gilgit	52
		<b>Total</b>	<b>4538</b>

## 2. Training in FMD Epidemiology and Outbreak Response (for veterinarians and vet assistants)

No	Date	Province	District	Participants	Sample kits given
1	12-14 Dec-11	Punjab	Faisalabad	24	20
2	19-21 Dec-11	Sindh	Karachi	28	20
3	22-24 Dec-11	Sindh	Hyderabad	31	20
4	26-28 Dec-11	Sindh	Sukkur	27	20
5	9-10 Jan-12	Khyber Pakhtunkhwa	Peshawar	26	20
6	11-12 Jan-12	FATA	Peshawar	27	20
7	01-02 Feb-12	Gilgit	Gilgit	20	16
8	12-13 Feb-12	Baluchistan	Quetta	25	20
9	27-28 Mar-12	AJK	Mirpur	39	26
10	10-11 Apr-12	AJK	Muzaffarabad	36	20
11	19-20 Apr-12	Punjab	Rawalpindi & ICT	29	20
12	01-02 May-12	AJK	Rawalakot	25	20
13	02-03 May-12	Punjab	Bahawalpur	28	24
14	14-15 May-12	Baluchistan	Sibbi	30	30
15	16-17 May-12	Baluchistan	Naseerabad	31	30
16	21-22 May-12	Khyber Pakhtunkhwa	DI Khan	31	20
17	12-14 Jul-12	Khyber Pakhtunkhwa	Abbotabad	38	26
18	27-28 Aug-12	Khyber Pakhtunkhwa	Swat	42	25
19	29-30 Aug-12	Baluchistan	Kalat Division	30	23
20	31 Aug – 01 Sep-12	Baluchistan	Makran Division	31	20
21	03-04 Sep-12	Sindh	Larkana (Sindh)	25	20
22	04-05 Sep-12	Punjab	Gujranwala	27	19
23	06-07 Sep-12	Punjab	Lahore	26	23
24	06-07 Sep-12	Sindh	Mirpur Khas	27	24
25	11-12 Sep-12	Punjab	DG Khan	29	23
26	13-14 Sep-12	Punjab	Multan	19	15
27	03-04 Oct-12	Sindh	Karachi	32	25
28	12-13 Oct-12	Punjab	Bahakar	21	20
29	20-21 Dec-12	Punjab	Sargodha	34	32
30	10-11 Jan-13	Punjab	Lahore	29	26
31	29-30 Jan-13	Sindh	Hyderabad	36	30
32	01-02 Feb-13	Sindh	Sukkur	32	30
33	05-06 Mar-13	FATA	Peshawar	30	30

No	Date	Province	District	Parti- cipants	Sample kits given
34	18-19 Mar-13	Sindh	Khairpur	31	30
35	21-22 Mar-13	Sindh	Mirpurkhas	48	40
36	05-06 Apr-13	Punjab	Lahore	25	23
37	10-11 Apr-13	Punjab	Multan	29	25
38	10-11 Sep,2013	Punjab	Vehari DRDF	35	20
39	12-13 Sep,2013	Punjab	Multan DRDF	50	15
40	01-02 Oct-13	Punjab	Sahiwal (Engro)	29	10
41	31 Jan 2014	KPK	Peshawar (MVC)	38	
42	20 Jan-14	Punjab	DRDF	29	15
43	30 Jan-14	KPK	Peshawar	25	
44	30 Jan-14	FATA	Peshawar	20	
45	04-05 Feb-14	Punjab	Gujranwala	12	
46	13-14 Apr-14	Gilgit	Gilgit	18	18
47	18-19 Jun-14	Punjab	Lahore	24	14
			<b>Total</b>	<b>1378</b>	<b>967</b>

### List of reports produced by the project

#### *Quarterly Progress Reports*

- 1<sup>st</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Oct to 31 Dec 2010)
- 2<sup>nd</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Jan to 31 Mar 2011)
- 3<sup>rd</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Apr to 30 Jun 2011)
- 4<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Jul to 30 Sep 2011)
- 5<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Oct to 31 Dec 2011)
- 6<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Jan to 31 Mar 2012)
- 7<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Apr to 30 Jun 2012)
- 8<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Jul to 30 Sep 2012)
- 9<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Oct to 31 Dec 2012)
- 10<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Jan to 31 Mar 2013)
- 11<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Apr to 30 Jun 2013)
- 12<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Jul to 30 Sep 2013)
- 13<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Oct to 31 Dec 2013)
- 14<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Jan to 31 Mar 2014)
- 15<sup>th</sup> Quarterly Narrative Progress Report GCP/PAK/123/USA (1 Apr to 30 Jun 2014)

#### *Monthly Progress Reports*

- Monthly Progress Report for GCP/PAK/123/USA (April 2014)
- Monthly Progress Report for GCP/PAK/123/USA (May 2014)
- Monthly Progress Report for GCP/PAK/123/USA (June 2014)
- Monthly Progress Report for GCP/PAK/123/USA (July 2014)

### List of publications produced by the project

1. Pakistan FMD Bulletins

- a. Pakistan FMD Bulletin 1(1-2) Jan-Jun 2012
  - b. Pakistan FMD Bulletin 1(3) Jul-Sep 2012
  - c. Pakistan FMD Bulletin 1(4) Oct-Dec 2012
  - d. Pakistan FMD Bulletin 2(1) Jan-Mar 2013
  - e. Pakistan FMD Bulletin 2(2) Apr-Jun 2013
  - f. Pakistan FMD Bulletin 2(3) Jul-Sep 2013
  - g. Pakistan FMD Bulletin 2(4) Oct-Dec 2013
  - h. Pakistan FMD Bulletin 3(1) Jan-Mar 2014
2. Posters and leaflets/brochures
    - a. Protect Animals from Foot and Mouth Disease, Posters printed in 2012 in English and Urdu by the project.
    - b. Foot and Mouth Disease in Livestock: Importance and Control – A brochure published in Urdu for the Farmers in 2012.
    - c. Leaflet on “Assistance to the Veterinarians for FMD Control” published by the project in 2013.
    - d. Leaflet on “Assistance for the Livestock Farmers for FMD Control” published by the project in 2013.
  3. Jamal, M., Afzal M. and others (2011). Foot and Mouth Disease in Pakistan. In: Proceedings of SAARC Conference on Progressive Control of FMD in the region held in Kathmandu, Nepal.
  4. Afzal, M. and others. (2012) FMD Control in dairy colonies of Pakistan. In: Proceedings of the International Conference on Scientific Developments and Technical Challenges in the Progressive Control of FMD in South Asia, held on 13-15 February in New Delhi (Abstract page 37, presentation No 37)
  5. Afzal, M. (2012). Emerging zoonotic diseases. In: Training Course for Technical Staff of the Livestock and Dairy Development Department of Government of Punjab held in March 2012 at Lahore.
  6. Afzal, M. (2012). International Obligations of Pakistan in livestock sector. In: Training Course for Technical Staff of the Livestock and Dairy Development Department of Government of Punjab held in March 2012 at Lahore.
  7. Afzal, M (2012). Establishment of Disease Free zone with particular reference to FMD. In: Training Course for Technical Staff of the Livestock and Dairy Development Department of Government of Punjab held in March 2012 at Lahore.
  8. Hussain, M. and others (2012) Hot spots of FMD in Pakistan. In: Proceedings of International Livestock and Poultry Congress organized by Pakistan Veterinary Medical Association at the Iqbal Complex, Lahore on 13 – 14 March 2012.
  9. Khan, Ehtisham ul Haq and others (2012) Prevalence and Economic Importance of FMD. In: Proceedings of International Livestock and Poultry Congress organized by Pakistan Veterinary Medical Association at the Iqbal Complex, Lahore on 13 – 14 March 2012.
  10. Afzal, M. and others (2012) Progressive Control of FMD in Pakistan: project approach, outputs and activities. In: Proceedings of International Livestock and Poultry Congress organized by Pakistan Veterinary Medical Association at the Iqbal Complex, Lahore on 13 – 14 March 2012.
  11. Afzal, M. and others (2012) “Development of Technical Framework for the Progressive Control of FMD in Pakistan” A Poster Presentation at “FAO/OIE Global Conference on Foot and Mouth Disease Control” held on 27-29 June 2012 in Bangkok, Thailand.

12. Afzal, M. and others (2012) Progressive Control of Foot and Mouth Disease in Pakistan. In: Training course on Molecular Techniques for diagnosis of animal Pathogens held at NIBGE, Faisalabad in October, 2012.
13. Afzal, M. and others (2012) Control of FMD in Pakistan. In: Proceedings of FMD FAO-Wide Consortium held on 11-12 December 2012 at FAO (HQ), Rome.
14. Afzal, M. and others (2013) Progressive control of Foot and Mouth Disease in Pakistan. In: Proceedings of Biennial Conference of Pakistan Society for Microbiology held at University of Karachi on 28-31 January 2013.
15. Afzal, M. and others (2013). Progressive control of Foot and Mouth Disease in Pakistan. In: Proceedings of 4<sup>th</sup> West Eurasia Annual Roadmap Meeting held at Baku, Azerbaijan from 2-4 April, 2013.
16. Hussain, M. and others (2013). Progress on the Progressive Control of Foot and Mouth Disease in Pakistan. In: Proceedings of the International Livestock, Dairy and poultry Congress held at Lahore from 17-18 April, 2013.
17. Afzal, M. (2013) Progressive Control of FMD in Pakistan. Seminar delivered to faculty and students of the College of Veterinary Medicine at Texas A & M University, College Station, Texas on 11 June 2013.
18. Afzal, M. (2013) Progressive Control of FMD in Pakistan. Seminar delivered to Scientists at Plum Island Animal Disease Center, New York on 17 June 2013. Plum Island News, 10(3).
19. Afzal, M. (2013) Progressive Control of FMD in Pakistan. Seminar delivered to USDA staff at USDA (HQ) Building on 19 June 2013.
20. Afzal, M. and Others (2013) FMD Surveillance Model that works for FMD. In: Proceedings of the Global Foot and Mouth Disease Research Alliance Meeting held at Arusha, Tanzania from 8 – 10 October, 2013.
21. Afzal, M. and others (2013). Epidemiological features of the FMD in 2012-13 in Pakistan. In: Proceedings of the 8<sup>th</sup> FMD Reference Labs Network Meeting held in Bangkok on 14-15 November 2013.
22. Afzal, M. (2013). Controlling FMD in Dairy Herds in Pakistan. *Agro Voice*, 1(1):21-23.
23. Hussain, M. and others (2014) Surveillance and control of FMD in Pakistan. In: Proceedings of International Livestock, Dairy and Poultry Conference held in Lahore on 11-12 March, 2014
24. Afzal, M. and others (2014) Progressive Control of Foot and Mouth Disease in Pakistan. In: Proceedings of 5<sup>th</sup> Annual West Eurasia FMD-PCP Roadmap Meeting held in Astana, Kazakhstan on 23-24 April 2014.
25. Afzal, M. and others (2014) Working Model for Foot and Mouth Disease Surveillance in Pakistan. Poster presented at 2<sup>nd</sup> International Conference on Animal Health Surveillance held on 7-9 May 2014 at Havana, Cuba.

### List of initiatives

1. **Study tour** of 18 federal and provincial policy makers and senior professional management of the livestock departments to Turkey (Istanbul, Ankara and Erzurum) from 23-29 September 2012 to understand effective FMD control and vaccine production.
2. **National Consultative Workshop** on, “Production of Quality Foot & Mouth Disease Vaccine” was organized on March 9, 2013 at the Auditorium, Veterinary Research Institute Lahore. 65 policy makers, scientists/senior veterinary staff attended the Workshop.

3. A TeleFood Project on “**Capacity Building of Farmers for Mastitis Control by Improved Management and Early Detection of Sub-Clinical Mastitis**” was executed along with FMD control project from 15 Jul 2012 to 14 Mar 2013. Project outputs improved knowledge of local farmers that how to protect their animals against mastitis. The technical information (brochure in Urdu and presentations in local language), teat dipping, disinfectant and sub-clinical diagnostic devices distributed for the prevention and early diagnosis of mastitis greatly enhanced the knowledge of farmers about the importance of the disease and measures required for its control.
4. **M. Phil study** of a graduate student (Ms. Atka Jamil) at Quaid-i-Azam University, Islamabad was designed, funded and supervised by the project staff. The study was designed to determine the humoral immune response of buffalo calves following various local and imported foot and mouth disease (FMD) vaccines available in Pakistan. Three imported and two locally manufactured FMD vaccines, all containing serotypes A, O and Asia-1 were selected. Each group comprising 15 buffalo calves (age < 3 to 18 months) was administered either local or imported FMD vaccine. Results indicated that all 3 imported vaccines induced better level of humoral immune response throughout the study period than locally produced vaccines. Antibody titres were higher for imported vaccines containing aluminium and saponin as adjuvant as compared to oil-adjuvant.
5. **FMD Vaccination in Yaks:** Yak belongs to the Family *Bovidae* and in Pakistan, its rearing is confined to the higher altitudes of Gilgit-Baltistan (GB) and Chitral. The role of yak in highlands is much the same as that of camel in deserts. Most of the yaks are kept in remote areas where there is minimal veterinary coverage, and severe outbreaks of FMD affected up to 15% during 1999, 2005 and 2009. Thus a trail for FMD vaccination in yaks was initiated. Vaccination (primary and booster) was undertaken in 2 500 yak. No FMD outbreak was seen in vaccinated yaks while a huge outbreak in unvaccinated animals was seen in 2013 in the area. To further assist, the community, a TeleFood project (Improvement of Milk and Meat Production in Yak) was also undertaken by the project staff. Besides distributing feed, molasses blocks, posters and brochure were also distributed to the farmers for their education in the field of better nutrition and health management. A yak competition in 3 categories (heaviest, best milk producer and the most beautiful) was also organized during Shandur Festival from July 7-9, 2012. The response was overwhelming. A large number of farmers participated in the completion and prizes were distributed to the winners at the occasion of Shandur Festival.
6. To benefit a large number of farmers and for sustainability purpose, the project management introduced **cost sharing concept for FMD vaccination**. As the word about the success of project vaccination program spread, many dairy farmers particularly in Karachi approached project staff to include their animals in the vaccination program. This initiative was in direct response to dairy farmers request and is being successfully implemented now.

**Annex 6. Project activities status****1. Status of the activities and outputs under Intermediate Outcome 1, Capacity to diagnose FMD at serotype & genotype level enhanced**

<b>Output/ Activity</b>	<b>Status at time of mid-term evaluation</b>
<b>1.1. Strengthening of laboratory capacity for FMD diagnosis</b>	
1.1.1 Procurement of diagnostic kits and sample and blood collection material for district labs	Yes
1.1.2 Procurement of ELISA sets, kits and expendables for provincial labs	Yes
1.1.3 Procurement of virus isolation and molecular diagnostics for NVL	Yes
<b>1.2. Capacity building of field and laboratory staff</b>	
1.2.1 Training of district lab staff on lateral flow test, sample collection	Yes: 47 workshops for public and private vets covering every Province/ Region. 1 378 vets trained in field sample collection. 967 field sample kits provided.
1.2.2 Training of provincial lab staff on ELISA	Yes: two persons from each Province/ Region attended 15-day training held Nov-2012 and Dec-2013.
1.2.3 Recruitment of international consultant for training NVL staff on virus isolation, molecular diagnostics	Yes: consultant hired and trained NVL scientists in nucleic acid sequencing. USDA/Plum Island provided two expert trainers who trained in virus isolation from field samples at NVL.
1.2.4 Training of NVL staff & provincial on virus isolation, molecular diagnostics	Yes: Five laboratory scientists from NVL and Provinces were trained in molecular diagnostics at NIBGE, National Institute of Biotechnology and Genetic Engineering, Faisalabad.
<b>1.3. Proficiency testing of diagnostic labs</b>	
1.3.1 Recruitment of international consultant for training on the below	<b>No:</b> (see 1.3.2) – USDA provided additional inputs. After NVL was enrolled in regular Proficiency Testing with the FMD-WRL (1.3.2) the project did not consider it useful to recruit the Consultant.
1.3.2 Training on and development of proficiency testing protocol and quality assurance diagnostic system at NVL and provincial ELISA Labs	Yes: two teleconferences with USDA facilitated by Dr J Hamer (USDA Pakistan). Five persons attended special training ‘Laboratory Quality Management for Pakistan’ in Ames, Iowa, USA. NVL participated in WRL (Pirbright) proficiency test in 2012 and 2013, successfully identifying O, A and Asia-1 antigens and antibodies. NVL will participate in 2014 WRL test.
<b>1.4. Development of a harmonized (central and provincial) Laboratory Information and Management System (LIMS) software</b>	
1.4.1 Launching a contract request to invite companies/institutions to develop the software	<b>No:</b> initial contacts with US private LIMS providers indicated high set-up cost plus around USD 150 000 per year maintenance, beyond project budget. Project Coordinator visited USA in Oct-2011 and made contact with Texas A&M University (TAMU) Foreign Animal and Zoonotic Disease Defense (FAZD). FAZD/TAMU got separate US funding



Output/ Activity	Status at time of mid-term evaluation
	and identified NUST as Pakistan partner. Project made MoU with TAMU and NUST; project made LoA with NUST for technical support. The project negotiated that TAMU passes all codes to NUST, that is, not restricted. NUST provides training and technical support to participating laboratories.
1.4.2 Selected company/institution to develop the software and train NVL staff and provincial ELISA Labs	Yes: first release of LIMS Sep-2013. Second version now with 13 laboratories in Pakistan in May-2014. IT equipment provided to eight ELISA laboratories. Server currently hosted by FAO Representation in Islamabad, on GoP request.

## 2. Status of the activities and outputs under Intermediate Outcome 2, Surveillance of and response to FMD outbreaks improve

Output/ Activity	Status at time of mid-term evaluation
<b>2.1 Awareness raising of livestock farmers</b>	
2.1.1 Recruitment of national communications consultant	<b>No:</b> as a full-time person for the project duration was required and, therefore, the Project recruited a Project Assistant who supports communications and other Project activities.
2.1.2 Preparation, printing and distribution of posters, leaflets and brochures	Yes: posters (3 845) and leaflets (over 16 000) in English and Urdu printed and distributed. Posters displayed in most veterinary institutions.
2.1.3 Conducting awareness seminars/workshops	Yes: 109 farmer awareness meetings attended by 4 538 livestock keepers. The project has had a stall at livestock exhibitions and TV/radio publicity.
<b>2.2 Capacity building of field staff and policy makers</b>	
2.2.1 Training of field staff	Yes: <ul style="list-style-type: none"> <li>47 training workshops on FMD epidemiology, control and prevention for 1 378 [target = 800] field and laboratory veterinarians.</li> <li>Seven additional trainings, responding to private sector demand (Engro Foods Ltd, Dairy Rural Development Foundation, DRDF) and sample kits distributed.</li> <li>967 sample kits provided to field veterinarians.</li> <li>USDA/ Plum Island Animal Disease Center provided two days epidemiology training for senior Provincial specialists at NARC.</li> <li>University of California (Davis) gave two days training in bioportal software 39 to federal and provincial TAD officers.</li> </ul>

<sup>39</sup> The Disease BioPortal is a web-based system that provides real-time or near-real time access to local, regional, and global disease information and data. The system provides access to publicly available databases, as well as to private data through secure routing and sharing mechanisms. Tools are available for spatio-temporal display, graphics, and phylogenetic analysis of the data, as well as for downloading or uploading data. The Disease BioPortal is operated and maintained by the Center for Animal Disease Modeling and Surveillance at the University of California, Davis (<http://cadms.ucdavis.edu/>). Source: <http://bioportal.ucdavis.edu/about> accessed 02 Sep 2014.

<b>Output/ Activity</b>	<b>Status at time of mid-term evaluation</b>
2.2.2 Capacity building of senior (Technical) management (visit abroad-December 2011)	Yes: Study Tour to Turkey 23 to 29-Sep-2012 for 18 GoP Secretaries and Director Generals. Visited vaccine production facility and observed FMD control activities.
<b>2.3 Outbreak reporting, epidemiological investigation and submission of samples</b> 40	
2.3.1 Outbreak reporting, epidemiological investigation and submission of samples	Yes: the project has established an effective (but likely unsustainable) system which pays field veterinarians Pakistan Rupees (PKR) 1 000 when they submit a FMD-positive sample from a field outbreak (and a further PKR 1 000 when they visit to respond, as well as free vaccine and treatment medicines for the response). The outbreak reporting greatly exceeded expectations and yielded important epidemiological information on virus type and sub-type. The Project Document anticipated 1 500 outbreaks in three years. 1 088 outbreaks were reported in 2012 alone. 2 874 were reported in 2013. 1 588 were reported Jan to Mar-2014.
<b>2.4 Sero-monitoring for determining the level of virus circulation in different farming systems</b>	
2.4.1 Collection of blood samples	Yes, samples were collected from villages with no FMD vaccination programme: <ul style="list-style-type: none"> <li>• 1 156 samples submitted from Mirpur dairy farms and also small, rural farms in Azad, Jammu &amp; Kashmir, AJK (at Mirpur, Muzzaffarabad and Rawalakot).</li> <li>• 746 samples from desert system, Cholistan.</li> <li>• 136 samples from yak in Ghizer District, Gilgit.</li> </ul>
2.4.2 Laboratory Testing & Reporting	Yes: <ul style="list-style-type: none"> <li>• Samples analysed for viral non-structural proteins (NSP) to monitor virus circulation.</li> <li>• Around 50% Mirpur dairy farms positive.</li> <li>• Around 24% Mirpur small farms positive.</li> <li>• Around 3.5% Muzzaffarabad small farms positive.</li> <li>• Around 8.5% Rawalakot small farms positive.</li> <li>• Around 62% Cholistan farms positive.<sup>41</sup></li> <li>• Around 43% yak positive.</li> </ul>
<b>2.5 Creation of a rapid response mechanism for FMD outbreaks</b>	
2.5.1 Procurement of vaccine storage equipment (freezers, generators, vaccine	Yes: quantity of vaccine procured has greatly exceeded what was originally planned and budgeted. Cold chain components have been procured and supplied.

<sup>40</sup> Project outbreak definition: "FMD within an epidemiological unit (village or farm) within 21 days". After 21 days it is considered to be a new outbreak.

<sup>41</sup> Serotype O swept through in 2014 and serotype A in 2013. In Cholistan, there was considerable animal movement because of drought, which favoured virus transmission. O is normally circulating in Pakistan, but A had not been seen for many years.

Output/ Activity	Status at time of mid-term evaluation
transportation boxes)	
2.5.2 Vaccination of animals in case of outbreak	Yes: infected herd and nearest in-contacts, limited by quantity of vaccine available. Normally up to 50 animals vaccinated, but in specific cases can be more. Affected animals are treated
2.5.3 Outbreak Reporting to Project Management (Provincial & Federal)	Yes: Project Standard Operating Procedures (SOP) for response drafted and agreed at 22-Aug-2011 meeting at Veterinary Faculty, Faisalabad.
<b>2.6 Creation of a National FMD Epidemiology and Information System</b>	
2.6.1 Procurement of IT equipment	<b>No</b> , lack of GoP epidemiologist (see 2.6.2) delayed IT equipment procurement. Procurement of IT equipment ongoing in consultation with the newly nominated person..
2.6.2 Nomination of staff for national epidemiology node	<b>No</b> , the Federal Government has not identified a suitable epidemiologist, nor established the new veterinary epidemiology node. The candidate nominated in 2013 chose to work in University research instead. However, the Federal Government then nominated another early 2014, Dr. Aman Ullah, Senior Scientific Officer/Epidemiologist at NARC Islamabad to be responsible for epidemiology node at NARC.
2.6.2 Periodic bulletin	Yes: project publishes quarterly <i>Pakistan - FMD Bulletin</i> . The bulletin is available online at FAO Pakistan website.
<b>2.7 Strengthening of FMD monitoring programme in Landhi Dairy Colony in Karachi</b>	
2.7.1 Establishment of diagnostic system and provision of basic healthcare services	Yes: capacity building for field veterinarians and laboratory staff included personnel based a Landhi Cattle Colony. ELISA functions in the Landhi Veterinary Station Laboratory. Veterinarians respond to outbreak reports.
2.7.2 Collection of tissue samples, testing & reporting	Yes: veterinarians respond to outbreak reports and their response includes sample collection. The project-supported laboratories routinely test and report.

### 3. Status of the activities and outputs under Intermediate Outcome 3, Benefits of early and consistent immunization demonstrated

Output/ Activity	Status at time of mid-term evaluation
<b>3.1 Identification of appropriate vaccine for field use</b>	
3.1.1 Formation of expert committee for identification of appropriate vaccines	Yes: Experts Committee met 25-Aug-2011. Meeting chaired by Animal Husbandry Commissioner.
3.1.2 Procurement of vaccines	Yes: project budget line substantially increased to around USD 2 500 000 by budget revision for this purpose.
<b>3.2 Strengthening NVL capacity for evaluation of FMD vaccines</b>	
3.2.1 Recruitment of international consultant for training NVL & provincial staff on vaccine quality assurance at NVL	<b>No</b> : consultant was identified but pulled out late 2012 due to security concerns; two Turkish experts identified in 2013, but they have also declined.
3.2.2 Training NVL staff on quality assurance of vaccines	<b>No</b>
3.2.3 FMD Vaccine quality testing	<b>No</b>
<b>3.3 Effective vaccination in dairy colony production system</b>	
3.3.1 Selection of dairy colonies	Yes: selected are Khalsa colony (Peshawar), Landhi and Nagori colonies (Karachi), Rakh Chandrai colony (Lahore), Eastern Bypass and Quarry Road colony (Quetta), livestock farms (Mirpur) and Suhan and Tarial, Sihala and Golra Farms (Islamabad).
3.3.2 Vaccination of animals	Yes: within Landhi and other colonies, holdings were randomly selected in a public process (selection was necessary because demand exceeded supply). Prophylactic vaccination has been carried out on selected holdings and newly acquired animals are brought into the free-vaccination scheme. Latterly, vaccination cost-sharing introduced to respond to increased demand for project-procured, quality vaccine.
3.3.3. Booster dose after one month	Yes, and subsequent six-monthly vaccination.
3.3.4 Sero-monitoring	Yes: vaccinated animals all identified by ear-tag and blood-sampled for regular monitoring for infection.
3.3.5 Collection of oral swabs/probangs from animals leaving the colony	<b>No</b> , the project has not found it practical to obtain probang samples due to poor cattle-handling facilities on the farms and risks to veterinary staff. However, oropharyngeal swabs from seven Landhi Cattle Colony buffaloes were collected at slaughter in Karachi and processed for virus isolation.
3.3.6 Testing of oral swabs at NVL & reporting to the Project Management	One out of seven samples (see 3.3.5) was positive for serotype A.
<b>3.4 Early immunization in market oriented rural dairy production system</b>	

<b>Output/ Activity</b>	<b>Status at time of mid-term evaluation</b>
3.4.1 Selection of villages for early immunization	Yes: each Livestock Department identified three areas in their Province/Region and five villages in each.
3.4.2 Vaccination of animals & booster	Yes
3.4.3 Regular vaccination after every six months including new animals	Yes
3.4.4 Sero-monitoring, and reporting by provinces	Yes, regular monitoring for infection (clinical signs and serological).
<b>3.5 Evaluation of FMD vaccination effects on productivity in different dairy production systems</b>	
3.5.1 Selection of Farms	Yes, see activity 3.4.1 Farms are selected from multiple production systems, including desert, peri-urban dairy colonies, yaks in mountain region, small farms in Punjab
3.5.2 Collection of Production data & Reporting	Yes, but not completed. A comprehensive Baseline Survey carried out by Social Sciences Research Institute. Vaccination trials have yielded valuable data require more analysis and evaluation and may be worthy of publication.