

Public–private partnerships (PPPs) for efficient sustainable animal health systems and veterinary services

Bouda Vosough Ahmadi¹

Original: English

Summary: *A partnership between the public and private sectors (referred to as a Public–Private Partnership or PPP) is an important means of optimising animal health systems and Veterinary Services (VS) worldwide. The aim of this Technical Item is to provide an overview of the OIE PPP study and its outputs, including the OIE PPP Handbook and the e-learning course, for countries in the Middle East region, and to provide a few examples of existing PPPs in the Middle East region. The OIE's research in this field has determined three typologies of existing PPPs in the veterinary domain, namely transactional, collaborative and transformative. This Technical Item presents examples of PPPs gathered through the OIE PPP survey undertaken in 2017 or mentioned during the 8th West Eurasia Roadmap Meeting for the Foot-and-Mouth Disease Progressive Control Pathway (FMD–PCP), supplemented by a literature review focusing on various official publications as well as academic and grey literature. The main challenges identified in the examples reviewed were: lack of enabling institutional arrangements/frameworks; lack of effective coordination between the partners; retaining control of the animal health domain by the public sector; financial risks for the private sector; and lack of knowledge of private sector laboratories' needs. The main opportunities identified for PPPs were: established PPP legislation; vaccine security; drawing on successful examples; strengthening and extending public Veterinary Services; and empowering the private veterinary sector. It was concluded that: i) strong legislation and enforcement mechanisms for proper delegation of authority to ensure the quality and performance of private sector players are essential; ii) for the long-term success of PPPs in the veterinary domain in the Middle East region, substantial efforts and investments are crucial, to provide appropriate and high quality training as well as establishing and strengthening effective Veterinary Statutory Bodies.*

Keywords: *Middle East; public–private partnership; veterinary service; World Organisation for Animal Health (OIE).*

¹ Livestock Health Economist, European Commission for the Control of Foot-and-Mouth Disease (EuFMD)/Food and Agriculture Organization of the United Nations (FAO)

1. Introduction

A partnership between public and private sectors (referred to as a Public–Private Partnership or PPP) is an important means of optimising animal health systems and Veterinary Services (VS) worldwide. The World Organisation for Animal Health (OIE) has long recognised the important role of the private sector in the delivery of high quality and efficient services in the veterinary domain²: as such, the OIE definition of Veterinary Services³ encompasses more than just the official VS, and includes the enormous responsibility assigned to the private sector. While the national VS provide the fundamental management system for animal health and welfare and veterinary public health in OIE Member Countries, there is a huge potential to uncover by developing and implementing impactful and sustainable PPPs in the veterinary domain.

The aim of this Technical Item is to provide an overview of the OIE PPP study and its outputs, including the *OIE PPP Handbook* and the e-learning course, for countries in the Middle East (ME) region as well as to provide a few examples of existing PPPs in the region. This Technical Item presents examples of PPPs that were gathered through the OIE PPP survey undertaken at the end of 2017 (see Section 1.1) as well as examples mentioned during the 8th West Eurasia Roadmap Meeting for the Foot-and-Mouth Disease Progressive Control Pathway (FMD–PCP), which was held in Shiraz, Iran, in March 2019. This was supplemented by a literature review focusing on various official publications as well as academic and grey literature.

1.1. Background to the OIE PPP initiative

The *Public–Private Progress* initiative, conducted by the OIE with the support of the Bill & Melinda Gates Foundation and in collaboration with the French Agricultural Research Centre for International Development (Cirad), aims to encourage the development of PPPs in the veterinary domain, in particular to strengthen the capacities of national VS. This three-year initiative (November 2016 – November 2019) allowed the development and analysis of an online survey at the end of 2017, targeting all the OIE Delegates, as well as representatives from the animal health private sector worldwide. The results of this survey identified a wide range of possible PPPs in favour of efficient sustainable animal health systems and VS, which were classified in three clusters of PPPs in the veterinary domain, known as the ‘OIE PPP Typology’. Key success factors and obstacles in establishing and maintaining PPPs were also recorded in the survey, as well as participants’ expectations for the OIE to assist in the promotion and development of PPPs in the field of veterinary services. An expert consultation was subsequently organised in 2018 to help in the development of guidelines for publication in the *OIE PPP Handbook* [1], which was released at the 87th OIE General Session in May 2019. Subsequent workshops with public and private sector participants were organised at sub-regional level in Africa^{4,5} and are currently being organised in Asia to disseminate the guidelines. Further communication will take place in other regions, as is the case at the 15th Conference of the OIE Regional Commission for the Middle East (Abu Dhabi, United Arab Emirates, 10–14 November 2019). As a supplement to the *OIE PPP Handbook* [1], an interactive e-learning course providing an introduction to PPP was jointly developed by the OIE and the European Commission for the Control of Foot-and-Mouth Disease (EuFMD) and is available through the OIE e-learning platform (<https://elearning-ppp.oie.int/?lang=en>).

2 ‘Veterinary domain’: means all the activities that are directly or indirectly related to animals, their products and by-products, which help to protect, maintain and improve the health and welfare of humans, including by means of the protection of animal health and animal welfare, and food safety (from Chapter 3.4. on Veterinary Legislation in the OIE *Terrestrial Animal Health Code*).

3 ‘Veterinary Services are defined in the Glossary of the OIE *Terrestrial Animal Health Code* as follows: ‘the governmental and non-governmental organisations that implement animal health and welfare measures and other standards and recommendations in the *Terrestrial Code* and the OIE *Aquatic Animal Health Code* in the territory. The Veterinary Services are under the overall control and direction of the Veterinary Authority. Private sector organisations, veterinarians, veterinary paraprofessionals or aquatic animal health professionals are normally accredited or approved by the Veterinary Authority to deliver the delegated functions’.

4 The first regional workshop on public private partnerships in veterinary domain was held in Addis Ababa, Ethiopia, in August 2019 for English-speaking African countries: <https://rr-africa.oie.int/en/news/20190822.html>

5 The second regional workshop on public-private partnerships in the veterinary domain was held in Tunis, Tunisia, in September 2019 for French-speaking African countries: <https://rr-africa.oie.int/en/news/20190912.html>

1.2. Typology of PPPs

Research led by the OIE, in collaboration with Cirad, funded by the Bill & Melinda Gates Foundation and reported in the *OIE PPP Handbook* [1] has shown that PPPs typically fall into one of the following three broad categories: transactional, collaborative and transformative. Close to 100 examples of PPPs were reported and analysed to produce a typology for PPPs in animal health and the veterinary domain. The three categories of PPPs were identified using cluster analysis. This typology is of primary interest to present the diversity of possible interactions between the public and the private sectors in the veterinary domain and stimulate new potential partnerships, building on the wide range of experiences of countries. The typology can also help stakeholders determine which type of PPP best fits for a country's needs. Each of these categories is introduced and discussed in this section. These categories are not exclusive, but they show the breadth of approaches that have already been taken in many countries globally. Indeed, the analysis showed a degree of overlap and some successful PPPs may have elements from more than one of these categories. The typology described below should not be seen as a constraint to innovative approaches to PPP. The PPP types are mainly differentiated by the type of private partner, the type of initiation and funding, and the type of governance.

1.2.1 Transactional PPPs

This category consists of government procurement of specific animal health and/or sanitary services from private veterinary service providers, who are usually private veterinarians and veterinary paraprofessionals (VPPs), community-based animal health workers (CAHWs) and/or their associations. It is initiated and funded by the public sector, possibly with further payment from the producer who benefits from the service. Governance is mostly based on a mutually signed contract or agreement between a client (in most cases the government) and private service providers. The private service provider is contracted or given a sanitary mandate and trained and monitored by the public sector. The activities and intended outcomes are primarily defined by the public sector and contracts set out effective monitoring and evaluation and mechanisms for remedial action, if needed. However, good liaison and communication and a partnership approach are key to delivering optimal outcomes for both parties.

1.2.2 Collaborative PPPs

This type of PPP entails a joint commitment between the public sector and end-beneficiaries, often producer associations, sometimes a consortium of producer associations and a range of other interested private organisations such as veterinary associations. The aim is to deliver mutually agreed policies and/or outcomes. Collaborative PPPs may be initiated by either the public or private sectors and jointly resourced, possibly by non-monetary commitments such as personnel. In the OIE PPP survey, examples of collaborative PPPs were often driven by trade interests; however, they can also be joint programmes, e.g. for antimicrobial resistance (AMR) mitigation. Governance ranges from being regulated by legislation (e.g. joint delivery programmes, strong governance) to non-official agreement (e.g. consultation on animal health policies or light-touch governance), and decision making is shared between the collaborating parties.

1.2.3 Transformative PPPs

The aim of this type of PPP is to establish sustainable capabilities to deliver otherwise unattainable major programmes. These PPPs are often initiated by the private sector but sanctioned by, and working with, the national VS. Funded by national or multinational private sector companies, and perhaps initially enabled by international development assistance/funding, national/international or the philanthropic/charitable sector, they are more specifically aimed at achieving long-term sustainable business returns and/or delivering on a public good commitment of the private partner. There is often joint governance, such as signing a Memorandum of Understanding (MoU) between the private sector and the public partner.

2. An overview of PPPs in the Middle East

As mentioned earlier, under the *Public-Private Progress* initiative the OIE conducted a large survey among its 181 Members in 2017 and recorded close to 100 success stories of PPPs in the field of veterinary services, reported by both public and private partners. From this large experience base, the typology of PPPs in the veterinary domain (described in Section 1.1) was determined, which revealed the wide scope for possible fruitful partnerships. The analysis also identified the benefits, key success factors and main obstacles in each of the PPP cases. In the Middle East region, 6 of the 20 Members in the region targeted by the survey responded to the questionnaire, namely Afghanistan, Cyprus, Iraq, Jordan, Kuwait and Saudi Arabia. Information on examples of PPPs that were provided to the OIE at the time of the survey implementation (i.e. 2017) by four of these countries, namely Afghanistan, Cyprus, Kuwait and Saudi Arabia was particularly comprehensive, and these examples are therefore described in this report. It must be noted that the information gathered in the survey may not reflect the viewpoints of all the stakeholders from the public and private sectors and only provides a snapshot overview of some of the existing PPPs in the region reflected in the view points of the particular respondents at the time of the survey.

2.1. Reported examples

2.1.1 Afghanistan

A Sanitary Mandate contract scheme with private Veterinary Field Units (VFUs) was established in 2010 (still ongoing) in Afghanistan for disease reporting, sample collection and transportation to veterinary laboratories for diagnosis, vaccination of animals for the OIE notifiable diseases and implementation of passive and active surveillances for these diseases. The OIE notifiable diseases targeted are: foot and mouth disease (FMD), peste des petits ruminants (PPR), sheep and goat pox, rabies, avian influenza, Newcastle disease, infectious laryngotracheitis, infectious bursal disease, Marek's disease, anthrax, pasteurellosis, bovine tuberculosis, Q fever, brucellosis, listeriosis, chlamydiosis, glanders and contagious caprine pleuropneumonia.

The public sector is represented directly by the Ministry of Agriculture, Irrigation and Livestock (MAIL) and indirectly through the European Union and the World Bank (WB). The role of the public sector in this PPP is to prepare the contract, provide the necessary training and monitor the progress and implementation of the project as well as provide a set of guidelines. The private partners involved in this PPP are the Dutch Committee for Afghanistan (DCA), Relief International, Agha Khan Foundation and Madera (*Mission d'Aide au Développement des Économies Rurales en Afghanistan*) [3]. The private sector's role is mainly in the implementation of the defined and agreed activities including: use of premises and facilities such as training centres, technical expertise and personnel (about 358 veterinary paraprofessionals were engaged) and use of equipment and provision of materials and supplies.

This PPP was initially funded by the public sector through catalysers including the EU, WB and the government of Japan. In the subsequent two years, the project was fully funded by the WB, before being gradually handed over to the public sector (i.e. the government of Afghanistan), which is providing 40% of the funding needed for the project.

This Sanitary Mandate contract scheme has been the platform for a partnership to bring the country into stage 2 of the progressive control pathway for PPR control and eradication, as outlined in the FAO and OIE Global Strategy, and with nomadic pastoralists being identified as the primary target group following a risk assessment approach [2]. Under this part of the Sanitary Mandate contract, the public sector was in partnership with veterinary paraprofessionals to conduct vaccination campaigns with an agreed payment for the services performed, based upon specific deliverables.

This PPP has successfully generated results for both the public and private sectors. Examples of outputs and outcomes for the public sector are:

- a) implementation of PPR vaccination,
- b) improved quality of data collection in the field in a timely manner,
- c) improved disease prevention planning,
- d) strengthened capacity of the National Veterinary Services (NVS), and
- e) improved reach, access and visibility of the NVS.

The generated outcome and results for the private sector include:

- a) vaccination of 12.5 million pastoralist small ruminants,
- b) additional income for 358 private sector service providers,
- c) improved awareness of the roles of each sector,
- d) creation of linkages between other projects in the private sector, and
- e) improved communication and trust between the private and public sectors.

The key success factors of this PPP are as follows: establishing a good collaborative relationship between the public and private sectors in terms of on-time and speedy collection of disease samples as well as providing a good value for money service to farmers across the country. The main area for improvement of this PPP relates to uncertainty around the stability, availability and continuity of funding. The main constraints observed during the implementation of the PPP include the general security status of the country, a lack of well-trained staff at provincial level, and a lack of well-equipped diagnostic laboratories in most of the provinces. The quality, available quantity and proper storage of vaccines, together with a general lack of awareness, are key challenges.

2.1.2 Cyprus

In the Republic of Cyprus, there is a Veterinary Statutory Body, entitled the Cyprus Veterinary Council, which applies only to veterinarians. In order to practice in the Republic of Cyprus, a veterinarian needs to be registered with the Cyprus Veterinary Council, which operates under the auspices of the Ministry of Agriculture, Rural Development and Environment.

Since February 2017, a mass vaccination campaign has been in progress⁶ in Cyprus with a view to vaccinating the entire ruminant population (cattle, sheep and goats) against bluetongue virus-8 (BTV-8). The vaccine was purchased and stored by the Veterinary Authority (VA) and the vaccination has been conducted by authorised private veterinarians (AV) under the authority of the VA. These AV obtain the relevant doses of vaccine corresponding to each farm's animal population as recorded in the animal identification and registration database of the VA. Under the terms of the Ministerial Ordinance (MO) issued for this purpose, the vaccination is obligatory by law and the AV are obliged to provide the VA with a hard copy of the relevant data for each farm where they have vaccinated. The information to be provided includes the vaccination date, the total number of vaccinated animals and the ear-tag code of each vaccinated animal and the form must be signed by both the AV and the farm owner. The AV are obliged to prepare and submit this information both as hard copy and in electronic form.

No private sector funding is used under this PPP. The type of activity conducted by the public sector consists of vaccine purchase and storage and the type of activity conducted by the private sector consists of conducting vaccination, which is paid for by the farmers, who cover the cost of syringes, needles and labour. The private sector partners involved are private veterinarians, cattle sheep and goat farmers. In total, 41 private veterinarians have been involved in this PPP in 2017 when the OIE survey was conducted. The sustainability of the PPP is ensured through a Ministerial Ordinance issued for this purpose. The main strengths of this PPP are the expertise and experience of the private sector and the speed of implementation. The areas where improvements are needed include better communication between the public and the private sector. The main constraints identified are financial constraints and lack of effective communication between the stakeholders involved.

⁶ The latest update on the OIE WAHIS database is related to 2018 at the time of preparing this Technical Item.

2.1.3 Kuwait

Veterinary Law No. 1964 of Kuwait for preventive control measures for notifiable diseases sets out the respective roles and responsibilities of public and private veterinarians as well as farmers/animal owners. According to this legislation, during surveillance and control activities for notifiable animal diseases, relevant partners must work in partnership to coordinate and conduct activities relating to disease control measures. The main diseases targeted are bovine tuberculosis and bovine brucellosis, but other notifiable diseases are also covered by this legislation. The governance mechanism of this PPP is through legislation.

Public funds are channelled to this PPP through the Ministry of Finance for the various categories defined in this PPP. Funds are supplied on an annual basis as well as during outbreaks of animal diseases according to the scale of the outbreaks and the importance of the diseases. No private funding is being used under this PPP. The type of public sector activity includes: implementation and monitoring of animal health activities carried out by private veterinary service providers. Examples of private sector activity include: animal health and husbandry activities such as detection of diseases, and vaccination and treatment of animals in the field. The public partner involved is the Public Authority of Agriculture Affairs and Fish Resources of Kuwait. The private sector is represented by private contracting companies of private veterinarians, veterinary paraprofessionals and veterinary pharmacists. The total population of animals covered under this PPP consisted in 2017 of 27,500 cattle, 195,000 goats, 780,000 sheep, 4,600 equids and 81,000 camels.

The size and scope of the impacts of this PPP very much depend on the nature of the diseases and their consequences. Sustainability of this PPP is assured based on regular interaction between the public veterinary authorities and the private veterinarians and companies who are contracted. Strengths of this PPP are: understanding and collaboration regarding important animal diseases, including zoonotic and emerging diseases, by the private sector; and effective implementation of disease control measures. Main areas where improvements are needed include: suitability of financial resources and budgets for the PPP, which at the time of the survey (2017) were inadequate. Key constraints identified are: low level or lack of continuous and permanent technical cooperation between the partners; and insufficient financial resources.

2.1.4 Saudi Arabia

Alkharj Province in Riyadh Region is known as the capital of milk production in Saudi Arabia because it contains mega dairy farms, such as Almarai and Al Safi. In the vicinity of these farms, there are many small-scale dairy and beef-producing farms that are often the main risk of introducing infectious diseases to the mega dairy farms. Consequently, these mega dairy farms, owned by large companies and represented by the Saudi milk producers' association, agreed to participate in a PPP with the Ministry of Environment, Water and Agriculture to provide FMD vaccine to vaccinate animals in the smaller farms in the vicinity. The period of implementation of this collaborative PPP is over 15 years and the governance mechanism of this PPP is regulated by legislation. The public sector has not provided any funding for this PPP but the private sector (i.e. the Saudi milk producers' association, comprising a number of large milk producing companies such as Al Safi and Almarai) pays around 2.5 million Saudi Arabian riyals annually to buy FMD vaccines. These activities are conducted under the supervision of the Ministry of Environment, Water and Agriculture. The type of activities in this PPP include: providing FMD vaccine, vaccine delivery and vaccination as well as raising awareness. All the required funding is provided by the private sector (i.e. Saudi milk producers' association). The disease targeted is FMD, for which close to 350,000 doses of vaccine are used annually. The impact is reflected in a decreased prevalence of FMD in the small farms thereby reducing the risk of the disease from being introduced to the mega farms in the region. Consequently, minimising the circulation of the FMD virus potentially provides access to export markets for the mega dairy farms that could generate substantial trade profits. Sustainability of the project is assured by relevant legislation as well as by the commitment of the private sector driven by economic interests and access to export markets. The main strengths observed are the existence of good and effective VS, sustainable funding provided by the private sector and transparency between the public and private sector. The main areas where improvements are needed relate to shortcomings in the legislation governing the relationship between the

public and private sector partners. The main constraints identified in this PPP relate to the Veterinary Authority (VA) being spread between several ministries (few human resources) and weakness or lack of binding legislation.

2.2. Examples of PPPs from the West Eurasia FMD Roadmap

The 8th West Eurasia Roadmap Meeting for the Foot and Mouth Disease Progressive Control Pathway (FMD-PCP) was held in March 2019 in Shiraz, Iran, under the GF-TADs⁷ umbrella. Representatives of the VS of 14 countries (Afghanistan, Armenia, Azerbaijan, Georgia, Iran, Iraq, Kazakhstan, Kyrgyzstan, Pakistan, Syria, Tajikistan, Turkey, Turkmenistan and Uzbekistan) attended the meeting.

At this meeting, the participants agreed to promote the PPP concept and to support West Eurasian countries with developing, if and when relevant, sustainable PPPs to strengthen the national VS. In a specific session devoted to discussing PPPs, which was facilitated by the OIE and EuFMD/FAO, the attendees were split into two groups to discuss examples of PPPs applied to the FMD Laboratory network (WELNET) and the Epidemiological network (EPINET) existing in the Member Countries.

The main items mentioned and discussed by the EPINET participating countries were as follows:

- *Pakistan.* A PPP has been in progress in Pakistan for some years now, mainly focused on giving the private sector authority to: **a)** provide training for private veterinarians, **b)** conduct surveillance activities, including sample collection and testing, as well as vaccination. The government covers the costs based on a MoU.
- *Iran.* A transactional contract enables the certification and training of private veterinarians to conduct FMD vaccination. Collaborative PPPs exist **a)** with so-called 'mega dairy farms' authorised by the government to conduct their own vaccination (planning and implementation) under the supervision of authorised private veterinarians employed in these farms, **b)** with veterinary councils to train private veterinarians to conduct surveillance activities, such as sampling, testing and vaccination, **c)** with private vaccine manufacturers to meet the increasing demand for reliable vaccines.
- *Turkey.* The government has developed contracts **a)** with veterinary associations and with small ruminant livestock unions/associations to promote animal health and to implement an animal identification programme, **b)** with private veterinarians at provincial level, working for larger farms on vaccination and animal identification (ear tags).
- *Kazakhstan.* PPPs are developed **a)** with the veterinary association (council) to issue licences for veterinarians to work as qualified vets, **b)** with private veterinarians to carry out vaccination for nine animal diseases (vaccines are provided free of charge), and **c)** with the private sector for training (e-training and face-to-face) and for veterinary sanitary activities.

Various issues along the FMD-PCP where the VS could engage with the private sector and the different categories of key stakeholders in both the public and private sector were presented to provide a foundation for the discussions.

The participating countries in the FMD Laboratory network (WELNET) group listed several PPP initiatives in the field of diagnostics and vaccine production.

- Contracts between the central veterinary laboratory (CVL) and private sector laboratories were for services in testing of animal products and by-products for food safety, standardisation of test methods and protocols, including the introduction of ISO standards. Some CVLs were involved with private sector vaccine production laboratories for the development of new vaccine strains.

7 Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs): <http://www.gf-tads.org/>

- The representative of a vaccine manufacturer company (Boehringer Ingelheim) gave examples of PPP initiatives with countries for (i) long-term vaccine development and supply, provision of technical expertise in vaccine manufacturing with Iran; (ii) exchange of technical knowhow, standardisation, development of standard operating procedures (SOPs) and capacity for vaccine matching; and (iii) research and development of vaccines.
- Provision of training to the public services in collaboration with universities, training on HACCP and biosecurity in private sector laboratories, including training of inspectors in slaughterhouses.
- Accreditation of veterinarians registered with the respective national Veterinary Board/Council for ease of regulation was identified as a vehicle for implementing the PPP initiative especially in the provision of services.

The immediate challenges identified by countries to implementing PPP initiatives were the lack of an enabling environment, including appropriate legislation and strategies to engage with the private sector, and the lack of knowledge of private sector laboratories' needs, and identification of areas for mutual benefit. Existing tools such as OIE PVS Pathway missions' reports (including the laboratory-PVS Evaluation with Specific Content) were identified as a potential source of information on potential areas for PPPs.

The laboratory network of the West Eurasia Roadmap requested international organisations to provide some guidelines on the PPP initiative for the VS to engage with the private sector on FMD control.

2.3. Challenges and gaps for PPPs in the Middle East Region

Lack of enabling institutional arrangements/frameworks: The institutional arrangements for animal disease prevention and control need to consider, and be sensitive to, the objectives of the public and private sectors within the different components of livestock production systems. Moreover, the establishment of appropriate open platforms to facilitate the development of constructive collaboration between public and private actors in the livestock sector is crucial. The strengthening of public-private partnerships requires that the following issues are addressed: harmonisation of the specific agendas of the public and private sectors to be leveraged as a public good, and re-examining of key legislation and regulations to facilitate the engagement of the private sector in national animal health services and disease control strategies and policies.

Lack of coordination: Another identified challenge is decentralisation of the VS in a number of countries without adequate provision for co-ordination of the control of major transboundary animal diseases. Also, low involvement of the private sector in livestock service delivery is a real challenge that needs to be tackled.

Retaining control by the public sector: Retaining all aspects of disease control policies and their implementation by the public sector is a known historical challenge in many countries, including in the ME region. Delegating aspects of responsibility and training and authorising the private sector to act as a strategic partner of the public sector is a key to leverage and excel in using the capacities and resources of both parties in controlling animal diseases.

Financial risks for the private sector: The financial risks for the private sector in investing in PPPs in the veterinary domain are seen as a main barrier in many ME countries. Providing the assurances and guarantees that are at the heart of any PPP agreement will greatly encourage investments by the private sector in this area. Obviously, this must be adapted to each country based on its particularities in terms of the characteristics of its farming systems and market infrastructure, taking into account socio-economic, political and cultural and environmental considerations.

Lack of knowledge of private sector laboratories' needs: The immediate challenges identified by countries to implementing PPP initiatives were the lack of an enabling environment, including appropriate legislation and strategies to engage with the private sector, and the lack of knowledge of private sector laboratories' needs and identification of areas for mutual benefit.

Existing tools such as the OIE PVS Pathway missions' reports (including on laboratory and with Specific Content) were identified as a potential source of information on potential areas for PPPs and identification of areas for mutual benefit.

2.4. Opportunities for PPPs in the Middle East Region

Established PPP legislation: Many countries in the ME region have already created legal and policy frameworks for supporting PPPs and in some cases the relevant legislative bodies have ratified PPP-specific legislation that provides the necessary basis to initiate PPPs in many fields of the economy, including the veterinary domain and animal health. Nevertheless, stakeholder engagement in drafting and ratifying veterinary legislation must be further encouraged, particularly in the following areas: monitoring of clinical animal health services; trade regulation of livestock and livestock products; regulation of the production, import, supply and use of veterinary pharmaceutical products, including vaccines.

Vaccine security: In terms of vaccine security, especially about ensuring a sufficient quantity and a high standard of quality, private sector involvement in the development of vaccines for use in national disease control programmes must be encouraged and utilised. As indicated by Lubroth *et al.* [4], the vaccine requirements in many developing countries are likely to be met by routes such as technology transfer, development of specifically tailored vaccines for specific countries, and investment at the local level. This has been done in South America by partnerships between the public veterinary services and the private sector, including farmers associations and vaccine manufacturers. These authors also emphasised that for PPPs to be successful in this area, the socio-economic dynamics and the requirements for public service commitment in a commercially profitable environment must be taken into account. PPPs aimed at vaccine production in the ME region will satisfy the governments' mandate to have 'access to a sustained supply of efficacious and affordable vaccines from the private sector, while the private sector is satisfied to have a government-guaranteed demand within the competitive environment of different vaccine suppliers'³.

Learning from and drawing on successful examples: The review also showed that a number of existing PPP arrangements, particularly contractive ones that are mainly government-funded programmes, have been successfully implemented by contracting the private sector to deliver services related to animal health in various countries in the ME region.

Strengthening and extending public Veterinary Services: Implementing PPPs in the veterinary domain and particularly in animal health services will increase the responsibilities of the private sector in safeguarding animal health and welfare and contribute to decreasing public expenditure on veterinary services. This creates great opportunities for the public sector to utilise private sector service providers beyond what the public sector alone can directly fund and implement.

Empowering the private veterinary sector: In addition, establishing PPPs between the public Veterinary Services and private sector veterinarians and veterinary paraprofessionals provides additional financial benefits to private veterinarians and veterinary paraprofessionals that increase the sustainability of their services particularly in the field of disease detection, disease reporting, surveillance and control activities that may be under-served in some countries in the ME region.

2.5. The way forward

Creating enabling environments that encourage effective, efficient and sustainable PPPs is the most important factor in using this mechanism to address challenges in animal health. Establishing active dialogue and preferably a national and/or sectoral level PPP forum to start and continue permanent communications between the public sector and livestock sector stakeholders is an important starting point. Once this forum or platform is in place, conducting a thorough needs assessment is a key next step. The effective delivery of the various veterinary services to end-users (often farmers) must be considered as a priority for PPPs. PPPs that are targeted at the provision of animal health services such as diagnostics and vaccinations to small-scale livestock holders, especially in rural areas, should be encouraged as the market is not necessarily capable of resolving this issue. Farmers and producer organisations and

associations must be strengthened and have an important role to play in identifying their collective needs based on their objectives and visions for the future, which will lead their partnerships (collaborative PPPs) with the public sector aimed at improving animal health and controlling diseases. Effective veterinary governance entails the provision of veterinary services that are sustainably financed, universally available, provided efficiently without waste or duplication and in a manner that is transparent and free of fraud or corruption. Such PPPs in the veterinary domain along the livestock and food supply chains must include public sector veterinarians, private veterinarians and private veterinary paraprofessionals, private sector producers, farmers, processors and distributors.

3. Conclusions

The veterinary public sectors of ME countries are encouraged to consider transferring some aspects and parts of their traditional roles and activities in direct implementation of veterinary services, particularly with respect to animal health, to the private sector. They are also encouraged to facilitate the regulatory and financial environment to enable the veterinary services to be delivered by the private sector, even though the public sector might retain the ultimate responsibility to ensure that services are delivered according to their legal mandate. Effective and sustainable PPPs are strongly recommended as they will enable the public veterinary sector to extend and enhance the reach, quality and impacts of the national Veterinary Services, thus contributing to the wellbeing of the public and the wider society. Through these sustainable and effective PPPs, private veterinary service providers such as private veterinarians and veterinary paraprofessionals will provide a wide range of services than not only create financial benefits for themselves but also ensure that the government fulfils its duties and responsibilities. These could be done through the three main types of PPPs in the veterinary domain as defined by the OIE, namely through sanitary mandate contracts (transactional PPPs), collaborative PPPs such as PPP of dairy sector in Saudi Arabia (see 2.1.4), and transformative PPPs (no example for this PPP typology could be found in the ME region by the time of preparing this Technical Item). Engaging private sector players in PPPs requires an enabling environment that ensures that financial risk is minimised and provides guarantees and commitments that the public sector will support the private sector in the long term. Therefore, strong legislation and enforcement mechanisms for proper delegation of authority to ensure the quality and performance of private sector players are essential. For the long-term success of PPPs in the veterinary domain in the ME region, substantial efforts and investments in providing appropriate high-quality training as well as establishing and strengthening effective Veterinary Statutory Bodies are essential.

References

1. World Organisation for Animal Health (OIE) (2019). – The OIE PPP Handbook: Guidelines for Public–Private Partnerships in the veterinary domain. <https://doi.org/10.20506/PPP.2965>
2. World Organisation for Animal Health (2018). – PPR control and eradication programme in Afghanistan. The role of veterinary para-professionals in successful implementation. *Panorama*, **2018–2**. <http://dx.doi.org/10.20506/bull.2018.2.2877>
3. Dutch Committee of Afghanistan (DCA) (2019). – DCA Livestock Programs – Annual Report 2018. <http://www.dca-livestock.org/wp-content/uploads/2019/03/L02-028-DCA-VET-jaarverslag-2018-LR.pdf>
4. Lubroth J., Rweyemamu M.M., Viljoen G., Diallo A., Dungu B. & Amanfu W. (2007). – Veterinary vaccines and their use in developing countries. *Rev. Sci. Tech. Off. Int. Epiz.*, **26** (1), 179–201. <http://dx.doi.org/10.20506/rst.26.1.1737>

Appendix I**Resources on country-specific PPPs**

Djibouti

1. United States Agency for International Development (USAID) (2014). – Public-private partnerships for livestock service facilities: Lessons from Djibouti and Somaliland for the Mille Quarantine Center. <https://www.agri-learning-ethiopia.org/wp-content/uploads/2014/09/MoA-MoT-Livestock-Public-Private-Partnerships-Report.pdf>
2. UNHCR (2018). – Livelihoods Strategic Plan UNHCR Djibouti 2018-2022. UNHCR Livelihoods Unit. <https://www.globalcrrf.org/wp-content/uploads/2018/09/Djibouti-2018-2022-Livelihoods-Strategic-Plan.pdf>

Egypt

1. Dhehibi B. (2018). – Power to the partners? Public-Private Partnerships (PPPs) as an approach for more pluralistic agricultural extension service in Egypt. <https://repo.mel.cgiar.org/handle/20.500.11766/7781>
2. Global Partnership for Effective Development Co-operation (GPEDC) (2018). – Private sector engagement through development co-operation in Egypt, country case study. <http://www.oecd.org/dac/effectiveness/PSE-case-study-Egypt.pdf>
3. Food and Agriculture Organization of the United Nations (FAO) (2018). – Africa Sustainable Livestock (ASL) 2050 Livestock production systems spotlight – Egypt. <http://www.fao.org/3/i8477en/i8477EN.pdf>

Iran

1. Beldman A., van Berkum S., Kortstee H. & Zijlstra J. (2017). – Dairy farming and dairy industry in Iran. Wageningen, Wageningen Economic Research, Report 2017-010. 52 pp. <https://doi.org/10.18174/417175>
2. Heybati F., Roodposhti F.R., Nikoomaram H. & Ahmadi M. (2011). – Developing a model for Iran about the relationship between economic freedom indices and public-private partnerships. *African Journal of Business Management*, **5** (9), 3511–3522.

Iraq

1. Al-Salihi K. A. (2012). – An insight into veterinary education in Iraq. <https://veterinaryrecord.bmj.com/content/171/13/316.short>
2. United Nations Industrial Development Organization (UNIDO) (2011). – Draft law on public-private partnership. Private sector development programme for Iraq PROJECT FB/IRQ/08/007.
3. Lucani P. & Saade M. (2012). – Iraq: Agriculture sector note. Food and Agriculture Organization of the United Nations and The World Bank, 49. <http://www.fao.org/3/i2877e/i2877e.pdf>
4. International Fund for Agricultural Development (IFAD) (2017). – Republic of Iraq: Smallholder Agriculture Revitalization Project, Design completion report. <https://webapps.ifad.org/members/lapse-of-time/docs/english/EB-2017-LOT-P-10-Project-Design-Report.pdf>

Jordan

1. Ministry of Finance of Jordan (2019). – Public-Private Partnership Unit (PPPU). <https://pppu.gov.jo>

Lebanon

1. World Organisation for Animal Health (OIE) (2018). – Fostering public-private partnerships at the national and regional levels. A key step in building capacity for safe temporary importations of competition horses. *Panorama*, **2019**–2. <https://oiebulletin.com/?panorama=04-1-1-ppp-en>
2. Business News (2017). – Public-Private Partnership has finally become law. <http://www.businessnews.com.lb/cms/Story/StoryDetails/6194/Public-Private-Partnership-has-finally-become-law>
3. Crédit Libanais (2011). – Public-private partnership in Lebanon. Crédit Libanais SAL Economic Research Unit. https://www.creditlibanais.com.lb/Content/uploads/Public-Private_Partnership_Report.pdf

Libya

1. Food and Agriculture Organization of the United Nations (FAO) (2013). – Communication Plan in Animal Health in the frame of REMESA/RECOMSA. Ministry of Agriculture of Libya National Center for Animal Health (NCAH). http://www.fao.org/fileadmin/user_upload/remesa/library/Libya_REMESA%20RECOMSA%20Com%20Plan%20Final_.pdf
2. Heemskerk W. & Koopmanschap E.M.J. (2012). – Agribusiness development in Libya: a fact-finding mission. Wageningen UR Centre for Development Innovation. <https://edepot.wur.nl/245485>
3. Libyan Institute for Advanced Studies (LIAS) (2014). – Libya 2020 vision: a plan for transformative change by 2020. http://www.nationalplanningcycles.org/sites/default/files/planning_cycle_repository/libyan_arab_jamahiriya/libya-vision-2020_english.pdf

Oman

1. AFFIOMAN (2019). – Prospects and Opportunities for Agriculture, Fish & Food Investment. Minister of Agriculture & Fisheries of Oman. <https://affioman.com/data/events/investmentBookEN.pdf>

Saudi Arabia

1. Butcher T. & Al-Amr A.A. (2018). – Saudi Arabia emerging PPP regime. DLA PIPER, 09 August 2018. <https://www.dlapiper.com/en/oman/insights/publications/2018/08/saudi-arabia-emerging-ppp-regime/>
2. Food and Agriculture Organization of the United Nations (FAO) (2016). – Evaluation of FAO's technical cooperation assistance in the Kingdom of Saudi Arabia. Office of Evaluation, Country programme evaluation series. <http://www.fao.org/3/a-br270e.pdf%20>

Somalia

1. Food and Agriculture Organization of the United Nations (FAO) (2018). – Public-private partnerships in fragile states: Reflection on the practice, challenges and opportunities in Somaliland. <http://www.fao.org/3/i9308en/I9308EN.pdf>

Sudan

1. International Fund for Agricultural Development (IFAD) (2018). – Livestock Marketing and Resilience Programme. Republic of the Sudan, Supervision Report. Mission dates: 28 January-11 February 2018. <https://operations.ifad.org/documents/654016/4157e8fb-ce81-4357-a95a-c406913748a9>
2. Food and Agriculture Organization of the United Nations (FAO) (2015). – Country Programming Framework for Sudan. Plan of Action (2015-2019): Resilient Livelihoods for Sustainable Agriculture, Food Security and Nutrition. Khartoum, 2015. <http://www.fao.org/3/a-i4785e.pdf>

Syria

1. Food and Agriculture Organization of the United Nations (FAO) (2016). – Towards Resilient Livelihoods for Sustainable Agriculture, Food Security and Nutrition. PLAN OF ACTION FOR SYRIA (2016-2017): Resilient Livelihoods for Sustainable Agriculture, Food Security and Nutrition. Cairo, 2016. http://www.fao.org/fileadmin/user_upload/rne/docs/plan_of_action_syria_2016_2017.pdf

Turkey

1. Erol I. (2019). – Development of public-private partnership to support veterinary services: privatization and use of the sanitary mandate concept in Turkey. <https://slideplayer.com/slide/9526230/>

United Arab Emirates

1. United Arab Emirates Government (2019). – Public-Private Partnership (PPP). <https://www.government.ae/en/information-and-services/business/public-private-people-partnership/public-private-partnership>
2. Food and Agriculture Organization of the United Nations (FAO) (2017). – UAE and FAO hold a Stakeholder Consultation on the UAE's Food Diversification Policy Development. <http://www.fao.org/neareast/news/view/en/c/472131/>
3. Dulaimi M.F., Alhashemi M., Yean Yng Ling F. & Kumaraswamy M. (2010). – The execution of public-private partnership projects in the UAE. Construction management and economics, **28** (4), 393-402. <https://doi.org/10.1080/01446191003702492>
4. United Nations (2017). – UAE and the 2030 agenda for sustainable development: Excellence in implementation. https://sustainabledevelopment.un.org/content/documents/20161UAE_SDGs_Report_Full_English.pdf

Yemen

1. Food and Agriculture Organization of the United Nations (FAO) (2017). – FAO country programming framework (CPF) Republic of Yemen. <http://www.fao.org/3/a-bp587e.pdf>
2. Food and Agriculture Organization of the United Nations (FAO) (2017). – Smallholder Agricultural Production Restoration and Enhancement Project (SAPREP) (P162659). Environmental and Social Management Framework (ESMF). Global Agriculture and Food Security Program (GAFSP). Republic of Yemen, Sana'a, 2017. <http://www.fao.org/3/CA0297EN/ca0297en.pdf>
3. United Nations Development Programme (UNDP) (2013). – A Promising Sector for Diversified Economy in Yemen: National Agriculture Sector Strategy 2012–2016. https://www.undp.org/content/dam/yemen/PovRed/Docs/Yemen_National%20Agriculture%20Sector%20Strategy%202012-2016%20En.pdf

Appendix II**Resources on PPPs in the veterinary domain**

1. World Organisation for Animal Health (OIE) (2015). – An overview of public–private partnerships in veterinary medicine, Dr David Sherman; /n Seminar on the development of public–private partnerships to support veterinary services, 16 February 2015, Rabat (Morocco). <https://rr-africa.oie.int/docspdf/en/2015/PPP/01.SHERMAN01.pdf>
2. Hopper M., Salles Almeida J. & Garcia M (2012) – Public–private partnerships to enhance SPS capacity: what can we learn from this collaborative approach? Joint document of the Standards and Trade Development Facility and the Inter-American Development Bank. <https://tinyurl.com/y75t53sa>
3. Food and Agriculture Organization of the United Nations (FAO) (2010). – Public–private partnerships for animal health: Strengthening laboratories for local economies and food safety. FAO supports public-private partnerships as part of its overall veterinary laboratory support programme. <http://www.fao.org/3/aq636e/aq636e.pdf>
4. Lubroth J., Rweyemamu M.M., Viljoen G., Diallo A., Dungu B. & Amanfu W. (2007). – Veterinary vaccines and their use in developing countries. *Rev. Sci. Tech. Off. Int. Epiz.*, **26** (1), 179–201. <http://dx.doi.org/10.20506/rst.26.1.1737>
5. Food and Agriculture Organization of the United Nations (FAO) (2010). – Public–private partnerships for disease control. *Information Sheet*, April 2010. <http://www.fao.org/3/ak732e/ak732e00.pdf>
6. Standards and Trade Development Facility (STDF) (2006). – A strategy and action plan for selected African regions to enhance public and private sector capacity in meeting international sanitary standards in international trade of livestock and livestock products. STDF 13 Final Report. FAO/OIE. https://www.standardsfacility.org/sites/default/files/STDF_PG_013_Final_Report_2006.pdf

Appendix III**Resources on PPPs in agriculture**

1. Hermans F., Geerling-Eiff F., Potters J. & Klerkx L. (2019). – Public–private partnerships as systemic agricultural innovation policy instruments – Assessing their contribution to innovation system function dynamics. *NJAS-Wageningen Journal of Life Sciences*, **88**, 76–95.
<https://doi.org/10.1016/j.njas.2018.10.001>
2. Rankin M., Gálvez Nogales E., Santacoloma P., Mhlanga N. & Rizzo C. (2016). – Public–private partnerships for agribusiness development. <http://www.fao.org/3/a-i5699e.pdf>
3. Gowda C.L.L., Sudini H. & Gopalakrishnan S. (2016). – Role of public–private partnerships in biopesticides and biofertilizers research and development for sustaining agriculture production. *Recent Trends in PGPR Research for Sustainable Crop Productivity*, 221.
<https://repo.mel.cgiar.org/handle/20.500.11766/6725>
4. Thorpe J. & Maestre M. (2015). – Brokering development: enabling factors for public–private–producer partnerships in agricultural value chains. IDS-IFAD Report.
5. Ponnusamy K. (2013). – Impact of public–private partnership in agriculture: A review. *Indian Journal of Agricultural Sciences*, **83** (8), 803–808.
6. African Union – Interafrican Bureau for Animal Resources (AU–IBAR) (2012). – The Roles of the Public and Private Sectors in Livestock Services Delivery: Report of the Workshop, December 5-7, 2012. Naivasha, Kenya. <http://www.au-ibar.org/component/jdownloads/finish/53-progress-reports/1184-the-roles-of-the-public-and-private-sectors-in-livestock-services-delivery>
7. Warner M., Kahan D. & Lehel S. (2008). – Market-oriented agricultural infrastructure: appraisal of public–private partnerships. FAO.

Appendix IV**General resources on PPPs**

1. Achard P.O. & Di Berardino A. (2018). – Public-Private Partnerships: Strategic Assets and Managerial Models.
2. World Bank (2015). – World Bank Group Support to Public-Private Partnerships: Lessons from Experience in Client Countries, FY02-12. https://doi.org/10.1596/978-1-4648-0630-8_ov
3. Roehrich J.K., Lewis M.A. & George G. (2014). – Are public-private partnerships a healthy option? A systematic literature review. *Social Science & Medicine*, **113**, 110–119. <https://doi.org/10.1016/j.socscimed.2014.03.037>
4. Alloisio I. (2014). – Public-Private Partnerships: a focus on Energy Infrastructures and Green Investments. ICCG Reflection No. 22.
5. Organisation for Economic Co-operation and Development (OECD) (2012). – Public-Private Partnerships in the Middle East and North Africa: A Handbook for Policy Makers. https://www.oecd.org/mena/competitiveness/PPP%20Handbook_EN_with_covers.pdf
6. Overy A. (2010). – Global guide to Public-Private partnerships. [http://www.khoshaim.com/uploads/372926954-CS1110_ADD-431_v2_\(ZMag\).pdf](http://www.khoshaim.com/uploads/372926954-CS1110_ADD-431_v2_(ZMag).pdf)
7. Economist Intelligence Unit (2009). – The 2015 Infrascope: Evaluating the Environment for Public-private Partnerships in Latin America and the Caribbean. <https://doi.org/10.18235/0000917>
8. International Finance Corporation (IFC) (2010). – IFC Advisory Services in Public-Private Partnerships: Smart Lessons from Infrastructure, Health and Education. <https://library.pppknowledgelab.org/documents/2031/download>