Government of the Sultanate of Oman

Sustainable Agriculture and Rural Development Strategy towards 2040 (SARDS 2040)

SARDS 2040 Investment Plan 2016-2020

October 2016

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June 2016

The contents of this Investment Plan (IP) are based on preliminary analyses resulting from interactions with relevant stakeholders during formulation of the *Sustainable Agriculture and Rural Development Strategy towards 2040* (SARDS 2040), as well as review of available material. The recommendations and suggestions included in the IP express the opinions and agreements reached during a series of stakeholder meetings organized for the purpose of formulating the SARDS 2040 and its relevant IP.

The budget attributed to the various IP projects, and consequently their outcomes, is purely indicative. It corresponds to the budget prepared by the Ministry of Agriculture and Fisheries (MAF) for its 9th Five-Year Plan (FYP) (2016-2020), prior to the preparation of the SARDS 2040 IP. As the IP seeks not only to set the MAF's investment priorities for the next five years, but also consider investments that should be undertaken by institutions other than the MAF, the current IP budget allocation will need to be revised during the detailed design of the projects identified under each IP programme. The IP budget revision and fine-tuning will be part of the regular SARDS 2040 implementation and monitoring process.

The SARDS IP 2016-2020 is organized into eight sections. **Section 1** is the executive summary. **Section 2** is an overview of how the IP stems from a wider planning process in the country, its guiding principles, scope and formulation process. **Section 3** summarizes the MAF's past investments, classified by SARDS intermediate outcomes. **Section 4** represents the building block of the IP, with a description of the main investments in the agriculture and rural sector for the next five years. **Section 5** proposes the implementation arrangements of the IP. **Section 6** is dedicated to the monitoring and evaluation of, and learning from, the IP. **Section 7** describes the major assumptions and risks underlying the IP, and **Section 8** summarizes the way forward and key steps to ensure prompt implementation. The **annexes** contain the list of interventions planned by the MAF for the 9th FYP, additional interventions required to meet the priorities of the SARDS 2040 and its IP and public-private partnership investments envisaged by the MAF.

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Abbreviations and Acronyms

AFDF	Agriculture and Fisheries Development Fund
AIS	Agricultural innovation system
CBO	Central Bank of Oman
CF	Commercial farm
CFS	Committee on World Food Security
CMA	Capital Market Authority
COOP	Cooperative
CSO	Civil society organization
DG	Directorate General
DGAD	Directorate General of Agriculture Development
DGALR	Directorate General of Agriculture and Livestock Research
DGAW	Directorate General of Animal Wealth
DGMIAL	Directorate General of Marketing and Investment for Agriculture and Livestock
DGPD	Directorate General of Planning and Development
DRC	Diwan of the Royal Court
DRRM	Disaster risk reduction and management
EAFRD	European Agricultural Fund for Rural Development
EAGF	European Agricultural Guarantee Fund
EAGGF	European Agricultural Guidance and Guarantee Fund (substituted by the EAGF and EAFRD)
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign direct investment
FYP	Five-Year Plan
GAP	Good agricultural practices
GCC	Gulf Cooperation Council
GDP	Gross domestic product
GHP	Good hygiene practices
GMP	Good manufacturing practices
GI	Geographic indication
GIAHS	Globally Important Agricultural Heritage System
GIS	Geographic Information System
GMP	Good manufacturing practices
HACCP	Hazard analysis and critical control point
HoReCa	Hotel and restaurant catering
KM&L	Knowledge management and learning
IF	Individual farmer
IFC	International Finance Corporation
IO	Intermediate outcome
IP	Investment Plan
IPM	Integrated Pest Management
IsDB	Islamic Development Bank
ISO	International Organization for Standardization
MAF	Ministry of Agriculture and Fisheries
MDB	Multilateral Development Bank
MECA	Ministry of Environment and Climate Affairs
MOCI	Ministry of Commerce and Industry
MOF	Ministry of Finance
MOFA	Ministry of Foreign Affairs
MOI	Ministry of Information
MOHO	Ministry of Housing
MOH	Ministry of Health
MHC	Ministry of Heritage and Culture
MHE	Ministry of Higher Education
MOLAM	Ministry of Land Affairs and Municipalities
MOM	Ministry of Manpower
MOT	Ministry of Tourism
MRMWR	Ministry of Regional Municipalities and Water Resources
MSD	Ministry of Social Development
MSME	Micro, small and medium enterprise
M&E	Monitoring and evaluation
NCSI	National Centre for Statistics and Information
OCCI	Oman Chamber of Commerce and Industry
ODA	Overseas Development Assistance
ODB	Oman Development Bank
OFIC	Oman Food Investment Holding Company
OIE	World Organization for Animal Health
OMR	Oman Rial
PAIPED	Public Authority for Investment Promotion and Export (also known as *Ithraa*)

PASFR	Public Authority for Stores and Food Reserves
PASMED	Public Authority for Small and Medium Enterprises Development
PPP	Public-private partnership
PDO	Protected denominations of origin
RAI	Principles for Responsible Investment in Agriculture and Food Systems
RCA	Royal Court Affairs
RD	Royal Decree
RDP	Rural development programme
Riyada	Public Authority for SMEs (formerly PASMED)
R&D	Research and development
SARDS	Sustainable Agriculture and Rural Development Strategy
SCP	Supreme Council for Planning
SMART	Specific, measurable, achievable, relevant and time-bound
SME	Small and medium enterprise
SQU	Sultan Qaboos University
STS	Sanitary and phytosanitary measure
SWOT	Strengths, weaknesses, opportunities and threats
TA	Technical assistance
TRC	The Research Council
VGGT	Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests
USD	United States dollar
WTO	World Trade Organization

1. Executive Summary

The Investment Plan (IP) 2016-2020 is the operational arm of the *Sustainable Agriculture and Rural Development Strategy towards 2040* (SARDS 2040). While SARDS 2040 defines the vision and objectives to be achieved by 2040, the IP identifies the investment priorities and results to be realized in the medium term (2016-2020). The IP is fully aligned with Oman's Five-Year Plan (FYP).

As an entry point, the IP provides an analysis of government interventions in agriculture and rural development that have been implemented during the 8th FYP (2011-2015) by the Ministry of Agriculture and Fisheries (MAF) and the Agriculture and Fisheries Development Fund (AFDF).

The IP has been developed along the structure of the SARDS 2040, whereby investments contribute to SARDS 2040 objectives, organized into six outcomes and 21 intermediate outcomes (IOs), with relevant targets and timelines. As such, the IP maps the various projects planned by the MAF, within the scope of the 9th FYP, to the IOs under the SARDS 2040, and provides recommendations for their further alignment. As the estimated cost of all interventions considered under the IP might be higher than the allocation the MAF will receive under the 9th FYP, the IP identifies the main implementation priorities under each outcome. The IP also defines the stakeholders involved in the implementation and financing of the investments and actions under the IP.

Within the context of the SARDS 2040 reform agenda, the following are the top policy and institutional priorities and related investments:

(i) **enforce the regulatory framework on water management and use,** enabled by investments in water metering, the creation and training of water users' groups and increased crop productivity;
(ii) **remove institutional and regulatory bottlenecks** to, *inter alia*, enable associations and cooperatives to carry out entrepreneurial activities, relax labour availability constraints or improve land use planning;
(iii) **support agribusiness development**, engaging with partners with experience in business development, hiring experts to provide specialized technical assistance and providing assistance and incentives to farmers to supply the demand generated by such agribusinesses;
(iv) **enhance the reliability of statistics** and other decision-making tools (through investments in capacity building and information systems);
(v) **reform the current subsidy arrangements towards a *smarter* incentive system**, conditional to the adoption of good practices; and
(vi) **launch an innovative rural development programme**.

The combination of priority policy reforms and targeted investments is intended to create a more conducive framework and enhance the quality of public service delivery. This should in turn enable the more active participation of private investors, while ensuring long-term sustainability.

1.1 The Programmes

Outcome 1, ***crop sector competitiveness increased***, comprises three IOs. An analysis of the projects planned under the 9th FYP resulted in the identification of 54 projects contributing to Outcome 1, for a total budget of OMR 94.0 million. The SARDS 2040 aims to increase water productivity and the overall value of the country's production by growing high-value crops, introducing the widespread adoption of good agricultural practices, minimizing losses and adding value through packaging and processing, differentiation, branding, etc. ***Investment priorities*** include establishing post-harvest infrastructure in key production areas (e.g., Al Batinah) and supporting farmers to supply these facilities with the required quality standards. Investments under Outcome 1 should also be coordinated with efforts under Outcome 3 (Sustainable use of natural

resources). Target groups should be farmers engaged in improved water resources management (e.g., in a given aquifer of Al Batinah or in a modernized *aflaj* irrigation system). Priority also needs to be given to countrywide interventions in biosecurity that ensure that the productive capacity of key crops (e.g., dates, coconuts) is not compromised.

Outcome 2*, livestock sector competitiveness increased*, comprises four IOs. An analysis of the projects planned under the 9th FYP resulted in the mapping of 43 projects contributing to Outcome 2, for a total budget of OMR 116.9 million. The SARDS 2040 aims to add value to livestock production and reduce its numbers to sustainable levels without compromising the environment. ***Investment priorities*** include establishing milk collection systems in order to strengthen the raw material base of the national dairy industry; providing animal health (e.g., diagnostic labs) and cold chain infrastructure (e.g., abattoirs for poultry cooperatives, refrigeration trucks); and rehabilitating rangelands in the Salalah area. Public support to investments should be centred in areas where agribusinesses are emerging. In this respect, livestock industry development in Dhofar is a priority, as stipulated in the SARDS 2040, with a special focus on the peculiarity and uniqueness of local genetic resources (e.g., camel and local goat products). Investments in large-scale, vertically integrated poultry operations would not, on the other hand, have a particular geographical focus, as long as biosecurity, proximity to end markets or input supply (e.g., hatching eggs) and the environment (in particular, litter management) are not at stake. However, as investment in abattoirs serving poultry cooperatives is one of the main priorities of the poultry industry, geographical areas with a high concentration of small and medium enterprises (SMEs) (broiler operations) should be targeted first.

Outcome 3*, sustainable management of natural resources in agriculture enhanced*, includes four IOs. An analysis of the projects planned under the 9th FYP resulted in the mapping of 11 projects contributing to Outcome 3, for a total budget of OMR 45.5 million. SARDS 2040 aims to progressively move towards the sustainable use of national water resources in order to achieve a ***zero water balance,*** while also increasing water productivity in agriculture and livestock production. Increasing water productivity in agriculture and livestock production is addressed through the production improvements necessary for achieving Outcomes 1 and 2. In order to achieve a zero water balance, ***priority setting for investment*** needs to focus on obtaining a sustainable water balance in the aquifers and regions of the country where: (i) agricultural production is concentrated and clear trends of groundwater depletion and seawater intrusion exist; (ii) farmers are organized, thus enabling water users' groups to be strengthened further; and (iii) opportunities for value addition are greater. Given these pre-conditions, the Al Suwayq zone of Al Batinah is a suitable area, along with some *aflaj* irrigation systems, where changes in production, irrigation techniques and farmers' organization indicate a strong potential for improving local livelihoods. All proposed interventions are aligned with the Strategy to *achieve a sustainable water sector in the Gulf Cooperation Council (GCC)* (2014)[1], the *Oman Salinity Strategy* (2012)[2] and the *National Water Resources Master Plan* (2000).

Outcome 4, ***resilience of agricultural and rural livelihoods to climate change and natural disasters improved***, includes two IOs for which there is currently no investment foreseen by the MAF. The required actions to achieve this outcome are related to climate change adaptation and mitigation as well as disaster risk management and resilience. They comprise improved planning and stronger institutional frameworks for coordination, collaboration and knowledge management. Most actions fall under the mandate of the Ministry of Environment and Climate Affairs (MECA), the Ministry of Rural Municipalities and Water Resources (MRMWR) or other similar institutions. In this domain, the key role of the MAF is twofold: (i) foster policy dialogue and improved inter-institutional coordination to ensure that the role of agriculture and rural development is mainstreamed into national strategies and action plans; and (ii) contribute to field and research operations to ensure that climate change, disaster risk management and resilience are mainstreamed into extension services and the dissemination of technologies and techniques for agricultural production, processing and marketing (i.e. throughout all interventions of the SARDS 2040).

Outcome 5, ***rural communities empowered and rural livelihood opportunities improved,*** is to be achieved through a multi-faceted intervention by a group of actors. Through this outcome, the SARDS 2040 proposes to launch a highly innovative ***rural development programme*** in a selected area of the country. This programme, which will need dedicated investments, will draw on agriculture

[1] Achieving a sustainable water sector in the GCC: Managing supply and demand, building institutions, Dubai, Strategy&, 2014 (available at http://www.strategyand.pwc.com/media/file/Achieving-a-sustainable-water-sector-in-the-GCC.pdf).
[2] Oman Salinity Strategy, Ministry of Agriculture and Fisheries & International Center For Biosaline Agriculture (2012).

and rural development as solutions for more equitable and sustainable development. The 9th FYP has a small number of projects related to this outcome. The focus of these projects embraces the enhanced management of natural resources in remote or disadvantaged rural areas (with a budget of around OMR 13.8 million); the development of SMEs in agriculture (OMR 1.0 million); and the promotion of farming at family level (OMR 1.0 million). All are relevant given the outcome's potential to generate improvements in rural livelihoods beyond those brought on by the increase in agricultural productivity. The programme should start on a small scale in a given area, enabling lessons to be learned and fine-tuning. The area of Jebel Akhdar is considered the most appropriate in light of its potential to generate immediate benefits. Implementation lessons can be used for scaling up successful programme interventions in other rural areas in the country. Another priority under this outcome is the programme for the recovery of important *aflaj* irrigation systems (the 9th FYP allocates OMR 11.0 million). The selection of *aflaj* should be based on their importance in terms of cultural heritage, tourism potential and production of key strategic agricultural products.

Outcome 6, ***enabling institutional environment for agriculture and rural development strengthened,*** comprises six IOs. An analysis of the projects planned under the 9th FYP resulted in the mapping of 15 projects for Outcome 6, for an overall request of OMR 67.3 million. Most of the projects relate to the modernization, refurbishment and renovation of the MAF's properties. However, in order to achieve the results expected under this outcome, the ***following priorities should be addressed*** and resources allocated: (i) institutional reform and enforcement of the regulatory framework, namely enforcement of the water law in a given region, and facilitation of collective entrepreneurial activities through regulatory reform; (ii) reform of the current subsidies towards a 'smart' incentive system; (iii) expansion of the provision and outreach of financial services; (iv) enhancement of the reliability of sector statistics and other decision-making tools, with an emphasis on producing information for the monitoring and evaluation (M&E) of SARDS 2040 implementation; and (v) awareness raising to garner public support for implementation of the various aspects of the SARDS 2040.

1.2 Implementation arrangements

Given that the SARDS 2040 is a national strategy and that the scope of its interventions extends beyond the mandate of the MAF, its formulation required the strong involvement of a large number of departments and institutions. The MAF will be the institution responsible for coordinating its implementation, monitoring and evaluation, while the Supreme Council for Planning (SCP) will oversee of its implementation and achievement of results. Effective SARDS 2040 implementation will require the solid engagement of leading institutions in the country, namely: the Diwan of the Royal Court (DRC), the Royal Court Affairs (RCA), and the Office of the Vision 2040. Many investments and policy reforms that do not fall under the MAF's specific mandate will require the establishment of specific committees or working groups for policy dialogue and reform, comprising a number of relevant ministries and chaired or coordinated by members of higher-level institutions.

In this context, the ***MAF is responsible for initiating and convening inter-institutional coordination and policy dialogue on the different subjects to be addressed by the SARDS 2040***, taking, as appropriate, a leading role, or delegating these functions to higher-level institutions such as the office of the SCP or the RCA. In fact, the MAF as the main implementing agency will have direct responsibility in planning and managing the SARDS IP, including:

(i) planning and implementing the MAF's public interventions;

(ii) stimulating SARDS-related private investments and public-private partnerships (PPPs);

(iii) collaborating with other institutions (e.g., when issuing licenses, permits or concessions by other ministries is required, or when a policy reform process needs to be initiated); and

(iv) advocating for other institutions to plan and implement the priority interventions of the SARDS 2040 that are not within the MAF's mandate.

In undertaking the above, the MAF needs to set up a ***tailored implementation mechanism*** for the interventions under its mandate, and a ***policy dialogue and inter-institutional coordination mechanism*** to facilitate the interventions of other institutions and ministries, as well as PPPs. Although structural or organizational changes of MAF are not deemed as necessary, ad-hoc

temporary technical advisors, or capacity development projects will be required to develop individual or organizational capacities within the MAF to implement the SARDS IP programmes.

At the MAF level, it is proposed that the responsibility for project planning, design, implementation and M&E be attributed according to the level of result:

(i) Outcome level – overall, the responsibility for outcomes rests with the Undersecretary for Agriculture (with support from the Directorate General of Planning and Development and selected general directorates, as appropriate);

(ii) IO level – the responsibility for IOs (programme management), depending on the nature of the intervention, can be assigned to a director-general or department director of the MAF, who will supervise implementation of the agreed activities, ensure annual planning and report on the interventions' progress (using the SARDS 2040 and specific programme key performance indicators); and

(iii) Individual projects – the specific programme manager, who will guarantee timely implementation of the planned interventions, will assign responsibility for implementation of individual projects (a coherent set of actions under each programme) to the most suitable officers in the MAF. These responsibilities will be agreed on at the planning stage and during progress checks on data collection (using key performance indicators).

Hence, the reporting and management line of SARDS IP implementation is as follows: the officers responsible for the implementation of individual projects report to the IO coordinator (director-general or director) who ensures overall supervision and, in turn, reports to/advises the outcome manager (MAF Undersecretary for Agriculture assisted by the Director-General of Planning).

1.3 Monitoring, evaluation and learning

The MAF will play the leading role in monitoring and evaluation (M&E) and learning. Learning will be embodied in a system that will: (i) ***provide regular information on implementation progress*** and guide implementation of SARDS IP programmes and projects, permitting corrective action to be taken when required, including advising how to reorient activities and approaches, or resources to be reallocated; (ii) ***ensure that appropriate information is collected*** throughout implementation, providing a basis for project evaluation; and (iii) ***provide the basis for advocacy and the sharing of knowledge and lessons learned*** through the publication of regular reports and the adoption and use of a wide variety of communications tools.

Analysis and reporting will be carried out **annually** and the overall responsibility of communicating data for advocacy will lie with the Undersecretary and the designated programme managers (IO). M&E findings on IP implementation will be analysed and discussed in the SARDS annual review meetings, led by the MAF, in coordination with key institutions in the country. The meetings will inform decisions on improving implementation and serve to advocate for financial commitments. In order to ensure greater participation and broader advocacy potential, all concerned public institutions, private sector representatives and other institutions will be invited to the annual meetings

The IP 2016-2020 is the first five-year planning iteration of the SARDS 2040. By 2019, a thorough review of the IP should be undertaken in order to learn from this first five-year plan and better prepare for the second IP 2021-2025. A similar exercise should be carried out at the end of the second iteration in order to ensure continuous learning and progress.

1.4 Risks analysis and management

When formulating the SARDS 2040 and planning for investments, a number of assumptions were made with respect to the adoption of proposed interventions, implementers' disbursement capacity and policy framework changes. Should these assumptions not hold, achieving expected SARDS 2040 results will be at risk. Section 7 presents a table summarizing the major risks associated with SARDS implementation and management, with a specific focus on the IP. The main risks and mitigation measures can be classified under one of the following categories:

- *External economic environment is not conducive to public (or private) investment.* Low oil prices and global recessions can affect investment capacity in agriculture.
-

  → Identify and give priority to small investments with high impact, such as support for policy reform or investment efficiency gains in government expenditure, like the reform of subsidy schemes.

- *The level of institutional coordination and the specific technical capacities of the main stakeholders hold back SARDS 2040 implementation*. Ministries do not engage in effective collaboration and dialogue, the MAF and its partners cannot identify and mobilize the required expertise, legal frameworks that are not conducive to private investment are not reformed and management of PPPs is not adequate.

  → Establish supra-ministerial coordination of key matters and engage in open policy dialogue to advocate at the highest political levels, through evidence-based (i.e. studies) arguments, on the need for reform, and attribute clear responsibilities for achieving SARDS 2040 targets to key staff.

- *The existing agricultural innovation system is not capable of introducing changes where they are most needed.* Research is not driven by demand or undertaken in collaboration with the people for whom it is intended, and technical assistance and incentive systems fail to bring about change in the value chain tiers where it is most needed to unlock each sector's potential.

  → Integrate research into a general innovation planning system in which part of the research is done on-farm; train MAF and PPP enterprise technicians on international best standards and on all related issues; enable the provision of private technical assistance services; identify top practitioners among farmers and support them to lead by example; and restructure the incentives system.

- *Farmers and rural society do not engage in the necessary changes to achieve SARDS 2040 results*. Absentee farmers or farm managers with unstable land leases and/or labour contracts (especially foreign workers) may not have the necessary incentives to change current practices or invest in agriculture.

  → Create an incentive programme for young farmers; improve land leasing regulations to provide more security to land renters; and engage foreign workers and managers in technical assistance and cross-learning activities.

- *Biosecurity and food safety are not guaranteed.* The lack of biosecurity increases risks for investors and deters agricultural investment and development, whereas low food safety hampers product differentiation and competitiveness in higher-value markets.

  → Prioritize the establishment of appropriate quality standards and monitoring systems (including animal identification), veterinarian education and disease control projects (for both livestock and crops).

- *Omani society does not ask for or support the necessary actions to achieve SARDS 2040 results.* Absolutely necessary but controversial measures such as water metering and management, or improved food safety controls, will never be accepted and adopted by farmers if they, or policy-makers, feel little pressure from the society at large.

  → Select key issues for awareness campaigns and education interventions and hire professional, experienced institutions to design and implement them.

1.5 The way forward

The IP allows the MAF and all key institutions operating in the sector to adjust the planned interventions in a results-oriented manner and contribute more effectively to the identified priorities. Also, the IP calls for the development of dialogue with all stakeholders to ensure that policy bottlenecks are identified and can be eliminated in order to stimulate greater private sector participation. This should be one of the starting points of implementation.

Within the IP's first year of implementation, the MAF will clarify investment priorities within available budget, attribute outcome and intermediate outcome coordination, implementation, monitoring and evaluation responsibilities to directors-general and department directors, and start to mobilize the required expertise to implement the SARDS IP. It will also create the basis for cross-institutional dialogue with the higher Omani authorities, other ministries, institutions and the private sector.

Implementation should start by addressing the top priorities identified by the SARDS IP (water metering, institutional reforms on associations, labour, land planning, support to agribusiness development, financial services, progression towards a system of smart incentives and a pilot rural development programme).

2. Introduction

Role, guiding principles, scope, formulation process

During the last few years, the Sultanate of Oman has made considerable efforts to enhance the effectiveness of planning and implementation of public and private investments. The preparation of the *Sustainable Agriculture and Rural Development Strategy towards 2040* (SARDS 2040) and its related Investment Plan (IP) represented an opportunity to build from past successful experiences and to further enhance investment planning efficiency, effectiveness and consistency, the final objective being to improve the welfare of current and future generations. The elaboration of the SARDS 2040 IP and its future implementation are fully compatible with – and an integral part of – the country's current national planning and investment efforts.

2.1 A plan embedded in the SARDS 2040 and contributing to the Vision 2040

The existing national five-year planning process is a consolidated mechanism with positive aspects and areas for improvement. On the positive side, it endows public stakeholders with a fast and flexible planning and implementation mechanism that allows for allocations to be adjusted in line with changing needs. On the other hand, it has a few shortcomings that impact negatively on investment effectiveness, the most relevant of which are:

(i) Fragmentation of interventions: the projects can be very specific (e.g., construction of a clinic), missing the opportunity to have a structured package of investments.

(ii) Insufficient learning from implementation results: a systematic process of monitoring and assessing the results of investment operations is lacking, which, if in place, could inform future planning.

(iii) Insufficient collaboration between ministries: there is potential to build on each other's strengths to develop synergies (especially for water management), thus enhancing results at operational level.

Investment planning is the initial step, before detailed projects are developed, and provides the opportunity to harmonize national investment efforts. The current IP represents a paradigm shift in the country's planning process with regards to previous five-year planning processes.

The main innovations in the present investment planning respond to SARDS 2040 objectives (Results Framework [RF]) and priorities, specifically by:

(i) aligning the programming of investments with policy interventions having common objectives, and contributing to the Vision 2040;
(ii) selecting public investments and policy interventions that are geared towards fostering long-term growth and competitiveness, and contribution of the private sector;
(iii) monitoring interventions in the agriculture and rural sector and measuring the results to orient (and adjust, if necessary) project design and implementation within each five-year planning cycle; and
(iv) assessing the interventions' results at the end of each planning cycle, providing the basis on which the strategy can be adjusted and a new investment plan formulated.

2.2 The role of an investment plan in an investment cycle

The formulation of an IP is one of the phases of an agricultural and rural development investment cycle. It is linked upstream and downstream to equally important investment cycle phases.

The first step of the investment cycle consists of developing a long-term strategy that aligns all the stakeholders in the country to a common vision. The strategy defines long-term objectives and medium-term actions. As an integral part of the strategy, ***the IP guides the selection of specific priority interventions to be implemented in the medium term***.

The first step in the preparation of an IP is the ***creation of an institutional consensus in order to reach an agreement and ensure commitment from key stakeholders on the financial and organizational efforts each shall undertake in implementing the strategy***. Once this agreement has been reached, the different stakeholders can engage in the design of detailed and concerted investment projects; these projects 'translate' the actions of the Strategy and IP into specific investment operations. From this moment, projects are designed, implemented, monitored and continuously adjusted.

At the end of an investment cycle (the duration of which should be in line with the country's budgeting and programming cycle), an assessment of the investments' contribution to achieving the Strategy's vision must be undertaken. Based on the findings of this assessment, the Strategy can be updated and a new IP for the following investment cycle discussed and agreed.

2.3 Guiding principles for the preparation, use and updating of the SARDS 2040 IP

The operational aim of the SARDS 2040 is to go beyond mere investment expenditure in order to increase the efficiency and accountability of public spending and to use public interventions to leverage private sector investments. Hence, as the operational arm of the SARDS 2040, the IP is guided by the following principles:

i. **Support SARDS 2040 implementation -** The IP provides a framework to systematize investments in agriculture aimed at achieving the expected SARDS 2040 results. The proposed investments are complemented, and their success enabled, by policy adjustments and institutional cooperation mechanisms proposed in the SARDS 2040.

ii. **Coordinate interventions between public and private stakeholders -** Having as a departure point a list of the Ministry of Agriculture and Fisheries (MAF) investments, the IP identifies public interventions (e.g., policy changes, interventions from other public agencies) and areas for private sector investments that contribute to SARDS 2040 objectives.

iii. **Foster Government and line ministries' leadership and stakeholders' ownership -** The IP is the fruit of discussion among a wide range of partners.[3] This dialogue and communication should continue on a regular basis, especially when updating the IP based on assessments of its implementation.

iv. **Facilitate and ensure a flexible management of the SARDS 2040 -** The IP builds on the flexible mechanism in place for the management (including resources) of Five-Year Plan (FYP) projects. It improves the current mechanism by proposing the systematized use of monitoring and evaluation (M&E) as a guide for improved decision-making.

v. **Promote accountability and results-orientation -** The formulation of the IP includes a description of the main roles and responsibilities assigned to each of the participating governmental and non-governmental institutions, as well as the necessary capacity-building

[3] Key stakeholders are the: Supreme Council for Planning; Oman Vision 2040 Office; Ministry of Finance; Ministry of Agriculture and Fisheries; Ministry of Regional Municipalities and Water Resources; Agriculture and Fisheries Development Fund; Ministry of Trade and Industry (including the Public Authorities for SMEs and for Consumer Protection); Ministry of Environment and Climate Affairs; Ministry of Social Development; Ministry of Tourism; Ministry of Heritage and Culture; Muscat Municipality; Sultan Qaboos University; The Research Council; Oman Development Bank; Oman Food Investment Holding Company; Oman Chamber of Commerce; and Al Batinah farmers association.

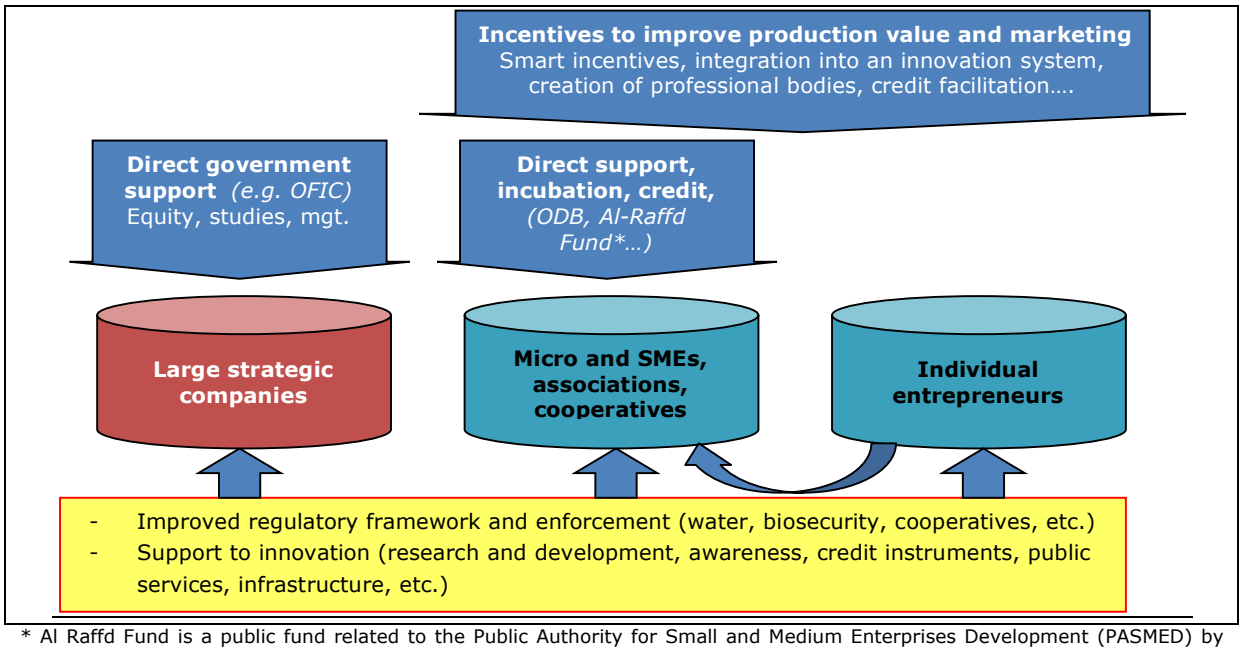
measures for all participating institutions that will enable the IP's effective implementation and assessment.

vi. **Leverage private investments -** The IP contributes to the progressive alignment of public investment with the needs, aspirations, capacities and opportunities of agricultural entrepreneurs.

vii. **Stimulate competitiveness of the sector** – Public investments and policy intervention priorities aim to foster the long-term growth and competitiveness of the agriculture and rural sector and to increase the participation and contribution of the private sector to this growth (see Figure 1 and Figure 2).

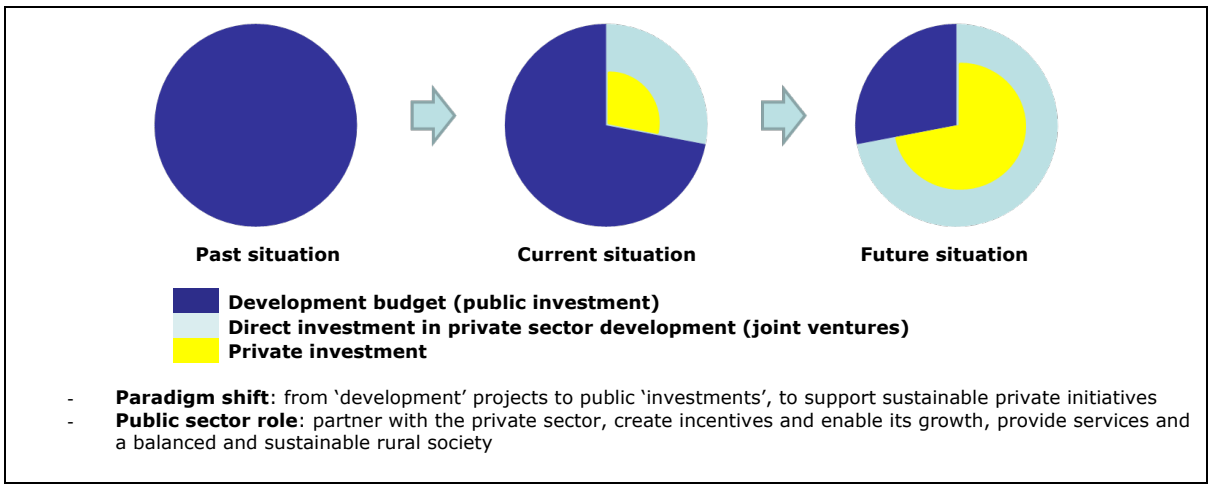
viii. **Foster social inclusion and environmental sustainability -** The IP translates the SARDS 2040 objective of: (i) including and rejuvenating rural populations; (ii) developing opportunities for women and youth; and (iii) focusing on interventions that do not degrade the environment, but that also mitigate future environmental threats, including water scarcity, desertification and increased vulnerability to climate change.

Figure 1 – Public policy and investment support for the development of different private actors



* Al Raffd Fund is a public fund related to the Public Authority for Small and Medium Enterprises Development (PASMED) by Royal Decree (RD) 6/2013.

Figure 2 – A paradigm shift: progressively diminishing the role of public direct investments in the growth of the agriculture and rural sector



- **Paradigm shift**: from 'development' projects to public 'investments', to support sustainable private initiatives
- **Public sector role**: partner with the private sector, create incentives and enable its growth, provide services and a balanced and sustainable rural society

2.4 Scope

The IP's scope is conditioned by the SARDS 2040. The SARDS 2040 defines both the results structure – outcomes and intermediate outcomes (IOs) – and the priorities for their implementation. It also defines who the stakeholders with direct participation are, who is responsible for implementation and who is financing the proposed activities.

The IP focuses on those investments that contribute to achieving the SARDS 2040 objectives, including increasing agricultural production, adding value to agricultural value chains, ensuring the sustainable management of land and water in agriculture and the existence of diversified and equitable economic activities in rural areas and strengthening the institutions that implement, monitor, assess and revise the SARDS 2040.

What is included. The IP comprises an analysis and action plan for:

- **public investments** in the 9th FYP of the key government institutions in agriculture and rural development (MAF) is only one for which data is available)[4]; and

- **public-private partnerships (PPPs)** that are envisioned by the Government and which could encourage/leverage other private investments in the agriculture and rural sector.

What is not included. As the IP focuses on changes in public investment and policy with the potential to leverage further investment from the private sector, some policy instruments or recurrent national expenditure items related to strategic food reserves, social protection or general policies that influence far more than just agriculture and rural development are purposely kept out of the scope of the IP.[5] They include:

- storage and sale of food by entities such as the Public Authority for Stores and Food Reserves (PASFR);
- subsidies that are covered by regular budgetary means, such as energy;
- safety net programmes, such as direct transfers from the Ministry of Social Development (MSD); and
- reforms and proposed changes to the agricultural education and training system.

The IP does not provide a detailed costing of SARDS 2040 programmes. The IP classifies the projects already planned by the MAF in the 9th FYP *along the programmes designed in the SARDS 2040*. The resources required for these programmes correspond to the total budget already allocated to them in the 9th FYP. The current budget will need to be revised during the detailed design of the interventions proposed under each programme. Additionally, as the IP aims to consider investments that should be undertaken by institutions other than the MAF, these will need to be added to the current budget.

A five-year time frame (preparing the ground for 2040) – Although the SARDS 2040 aims to establish a road map for achieving these objectives by 2040, the detailed programming of investments can only be realistically made for a shorter period of time; IOs in the medium term are not completely predictable and planning needs to adjust to new realities, funding sources and changes in resource availability.

2.5 The formulation process

The consultation process for the IP builds on that of the SARDS 2040. The identification of the main expected results and intervention areas was made in parallel with the SARDS 2040 development process and is reported in the Strategy.

[4] The initial intention is that the Ministry of Regional Municipalities and Water Resources and the Ministry of Environment and Climate Affairs and other relevant institutions are included during implementation as their collaboration on the SARDS 2040 objectives grows.

[5] For example, even though safety net programmes for rural populations affect the priorities to be established for agricultural development, they need to be programmed under a wider strategy for poverty reduction. Similarly, although reforms in the education system can largely influence the agriculture sector and rural areas in the long run, these require a strategy and investment plan by itself to be led by the Ministry of Education. Energy subsidies influence other sectors that have a far greater contribution to the country's gross domestic product than agriculture and cannot be analysed under a sector strategy. Food reserves concern mostly commodities that are not produced on a significant scale in the country (e.g., rice, wheat and tea).

2.6 Use of the Investment Plan

The IP 2016-2020 provides indications for the necessary actions to achieve SARDS 2040 objectives. As such, it: (i) provides a guiding framework for the implementation of identified investments and projects; and (ii) summarizes the need to mobilize additional resources, including non-governmental investment (private investors, lenders, possible donors).

Specifically, within the SARDS 2040 framework, the IP 2016-2020 carries out three functions, namely:

- ***framing and coordinating investments***: it helps frame investments along the SARDS 2040 priorities, avoiding overlap and looking for synergies in a consistent framework;

- ***advocating for investment***: it emphasizes priority areas of investment and highlights possible investment gaps, paving the way for a more comprehensive and effective set of investments in agriculture and rural development; and

- ***monitoring and evaluating investments***: it matches, at investment level, the SARDS 2040 Results Framework (RF); it thus contributes to measuring progress and informing the Government and other stakeholders about SARDS 2040 achievements.

Besides this, the IP 2016-2020 also helps set up rules for investing in agriculture and rural development: building on the information and knowledge generated through M&E activities, it provides the Government with the basic elements to change the rules of the game for investments in agriculture aimed at improving their performance.

3. Review of past public investments

Review of past investments as initial contributions for building on SARDS 2040 results

The IP builds on the results and lessons learned from previous investments; it is therefore important to analyse how these past investments have already contributed to the SARDS 2040 programmed interventions. Hence, this section provides an overview of the MAF's investments during 2006-2015,[6] which basically include all public interventions in the agriculture and rural sector carried out by the MAF within the 7th and 8th FYPs. The analysis that follows is based on official MAF figures, summarized in Figure 3 and Figure 4 below.

Figure 3 – Total allocated and disbursed by area of investment during the 7th FYP (in OMR)

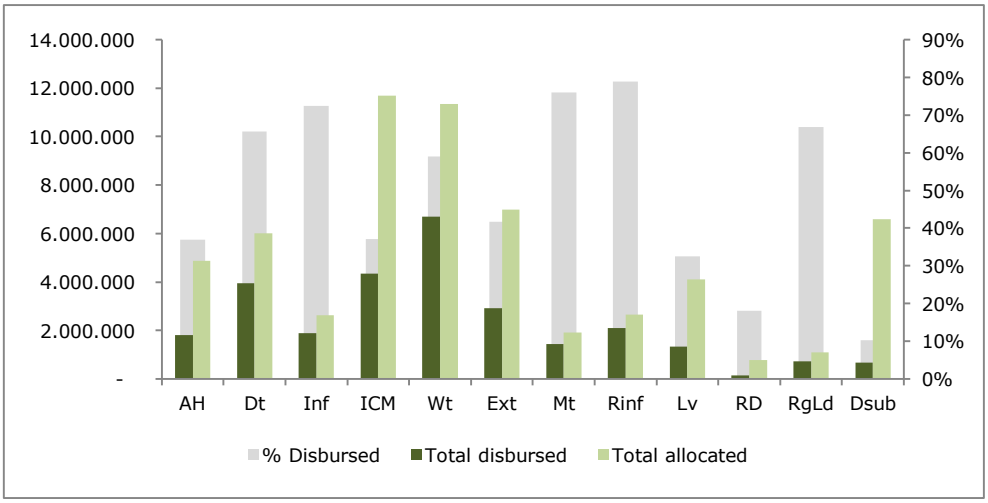
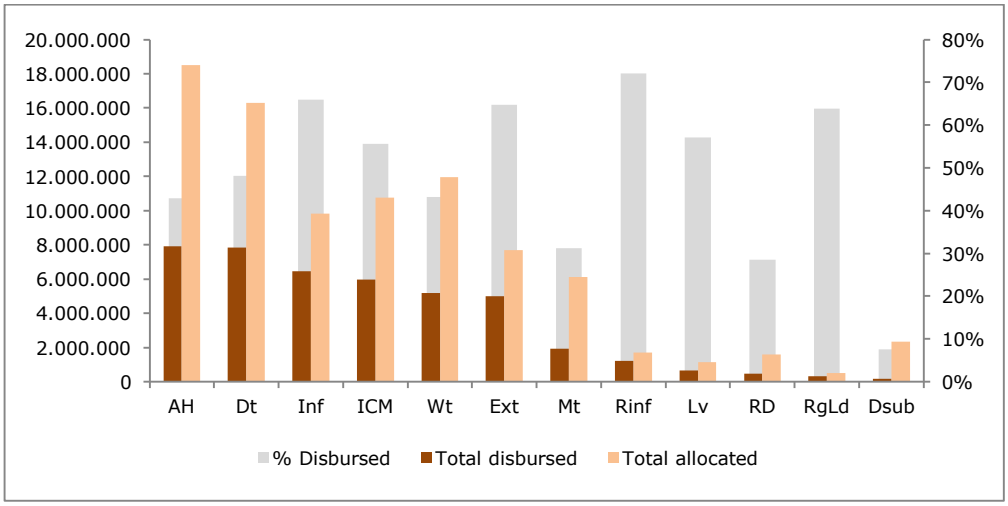


Figure 4 – Total allocated and disbursed by area of investment during the 8th FYP (in OMR)



Source: MAF (Directorate General of Planning and Development) for both figures.
The **acronyms** in the charts represent: **AH** = Animal health; **Dt** = Dates; **Inf** = Information; **Wt** = Natural resources management/water efficiency; **ICM** = Crop management; **Ext** = Extension; **Mt** = Building maintenance; **Rinf** = Research infrastructure; **Lv** = Livestock improvement; **RD** = Rural development; **RgLd** = Rangeland; and **Dsub** = Direct subsidies.

[6] The analysis was not extended to other relevant ministries or government agencies due to the lack of sufficient data while this document was being prepared.

3.1.1 Analysis of MAF past investments

Outcome 1: Crop competitiveness increased

From 2011 to 2015, the **dates subsector** benefited from a MAF direct investment of OMR 7.8 million. The investments focused on tissue culture research (OMR 2.0 million) and management of palm pests (OMR 4.8 million). Looking at the performance of the past two FYPs, the Ministry seems to be already beyond its implementation capacity, which may hamper the capacity to absorb (and meaningfully utilize) additional funds for the development of the dates subsector: of the OMR 6 million allocated for the 7th FYP to the dates subsector development, the MAF disbursed 65 percent, whereas with an allocation of OMR 16.3 million during the 8th FYP only 48 percent (i.e., OMR 7.8 million) could be implemented. In addition, in recent years, the Royal Court Affairs (RCA) approved the *One Million Date Palms* project, a large intervention expected to reach full production capacity soon.

Investments in **crop management** (representing a total of OMR 6 million and 14 percent of the 8th FYP) included diverse interventions that cannot be attributed to one specific subsector (crop or farming system).[7] From 2011 to 2015, OMR 2.1 million were invested on research, mostly on pest control and improvements in productivity. In addition, OMR 0.6 million were spent on the safe use of pesticides and chemicals. The investments from the Directorate General of Agriculture Development (DGAD) are closely related to this research, with integrated crop management (OMR 2.2 million) representing its largest focus.

Outcome 2: Livestock sector competitiveness increased

Livestock improvement in general seems to be a low priority in terms of the MAF's total investment. In the past FYP, only OMR 0.64 million were spent in this field (virtually all dedicated to research), down from the OMR 1.3 million invested during the 7th FYP. In addition, OMR 1 million was spent on introducing modern technologies in the livestock sector, implemented by the extension services and not necessarily linked to the research activities that were being undertaken. If changes are to be introduced in small-scale livestock production (for economic or environmental reasons), more public investment might need to be allocated to the livestock production subsector.

The largest investment envelope was attributed to **animal health,** reaching OMR 7.9 million in the past FYP, a large increase compared with the OMR 1.8 million invested in the 7th FYP. Investment during the 8th FYP was mostly dedicated to improving veterinary services (OMR 2.7 million were invested in clinics) and quarantine capacities (OMR 1.7 million, of which OMR 1.5 million were exclusively dedicated to setting up a facility in Bibdid). The SARDS 2040 should continue giving sufficient consideration to the need for the sustainability of these investments as well as their efficient and effective use: the Directorate General of Agriculture and Livestock Research (DGALR) invested OMR 1.3 million in animal health during the 8th FYP.

Outcome 3: Sustainable management of natural resources in agriculture enhanced

Natural resources management benefited from an MAF investment of OMR 5.2 million of which: (i) OMR 0.8 million was spent on research on the use of treated and saline water; (ii) OMR 2.6 million on the introduction of modern irrigation systems; and (iii) OMR 1.8 million on protection from soil erosion. The relatively lower investment in water management is probably due to: (i) the lack of an integrated strategy to tackle the issue, and a focus on technology change; (ii) part of the mandate for agriculture water management resting with the Ministry of Regional Municipalities and Water Resources (MRMWR); (iii) considerable research on water being commissioned through studies (Directorate General of Planning and Development [DGPD]) or made by the Sultan Qaboos University (SQU). Nevertheless, an integrated approach to water management requires not only investment but also improved coordination among stakeholders.

With regards to **pastureland** and animal feed, it is clear that after past unsuccessful experiments (such as a project dedicated to culling unproductive animals) no effective solution has yet been found. The project on improving natural pastures invested only OMR 0.3 million (64 percent of its allocation) and the large project in the Nejd for agricultural production, in particular forage production, could not disburse more than 5 percent of its allocation of OMR 2.3 million.

[7] During the 7th FYP, the bulk of the OMR 4.3 million invested (OMR 2.7 million) was dedicated to plant protection and aerial spraying against locust. The remaining budget was scattered among seven projects.

Outcome 4: Resilience of agriculture and rural livelihoods to climate change and natural disasters improved

This area of investment is mostly under the Ministry of Environment and Climate Affairs (MECA), and their past investment and current pipeline could not be assessed. The only exception is represented by a **post-disaster rehabilitation** project aimed at providing palm trees to people affected by climate disasters (around OMR 0.3 million, 13 percent of the foreseen budget of OMR 2.0 million).

Outcome 5: Rural communities empowered and rural livelihood opportunities improved

Finding solutions for the maintenance of **traditional farming systems**, for which the cultural, social and/or environmental interest is greater than the financial returns, was addressed through a pilot intervention in the 8th FYP, with only OMR 0.5 million invested during 2011-2015 (of the OMR 1.6 million initially allocated). No other interventions in the 8th FYP specifically addressed the development of rural livelihoods. It is, however, worth highlighting that an extension project specifically targeting the promotion and development of the capacities of rural women was identified and financed (OMR 0.3 million, or 35 percent of the foreseen budget of OMR 1.0 million).

Outcome 6: Enabling institutional environment for agriculture and rural development strengthened

The **provision of extension services**, key to introducing and fostering change in rural areas, represents 9 percent of the MAF's investment (excluding staff and building maintenance costs). However, these efforts are scattered among three Directorates General (Planning and Development, Agriculture Development and Livestock Wealth) and, of a total of OMR 5.0 million spent on extension, OMR 3.9 million were dedicated to technology transfer (subsidized equipment). SARDS-related investments in extension need to more efficiently contribute to a comprehensive agricultural innovation system (AIS) aimed at the gradual development of a competitive private sector in the country and at integrating research, extension, private support services, financial institutions, business incubators, etc. Considering that 19 percent of MAF investment spending from the 8th FYP (OMR 8.1 million) was done through the newly created DGALR, there was a large opportunity to finance a reform of the AIS. This opportunity should not be missed in the next cycle. Necessary changes are thoroughly discussed in the next sections.

Information, knowledge generation and sharing (excluding extension) absorb a large part of the MAF's investments (OMR 6.5 million), and are under the responsibility of the DGPD, including the Agricultural Census (OMR 2.4 million) and studies and consultancies (OMR 1.7 million). Training and qualification of staff are also important investment items, with OMR 1.5 million spent in total. The remaining budget was invested in information and communication systems.

3.1.2 Financial disbursement of the MAF in the 8th FYP

Overall, the 8th FYP budget amounted to an initial allocation of about OMR 88.4 million, and a final disbursement of around OMR 43.1 million, for a disbursement rate of around 48.7 percent. The low disbursement rate reflects, on the one hand, the MAF's limited implementation capacity and, on the other, possibly reduced funding from the Ministry of Finance (MOF).

A rapid analysis and classification of the MAF interventions according to the areas defined by the six SARDS 2040 outcomes enables some quick observations:

- ***There is a significant emphasis on crop and livestock production***, also reflecting, to some extent, the importance of enhancing the whole production and post-harvest system. Agroprocessing and marketing were not targeted by investment.

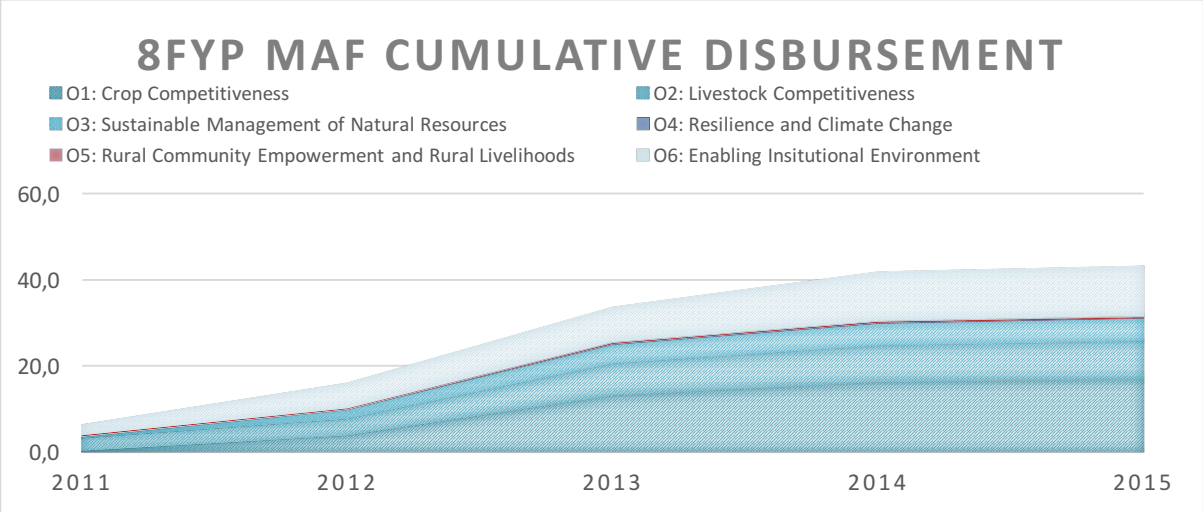
- ***There is a significant portion of the budget used for the renovation of physical infrastructure*** to ensure the proper functioning of public services (e.g., buildings, etc.). This is reflected in the classification of a large portion of the budget as contributing to Outcome 6.

- The emphasis in ***Outcome 4 is mostly on the management of the aftermath of disasters***, more than on a systematic approach on climate change adaptation, mitigation and resilience. However, this is mostly due to the MAF's limited mandate in this domain (mostly under the MECA).

- ***The contribution to rural development is very low***, partially due to the MAF's limited mandate in the sector.

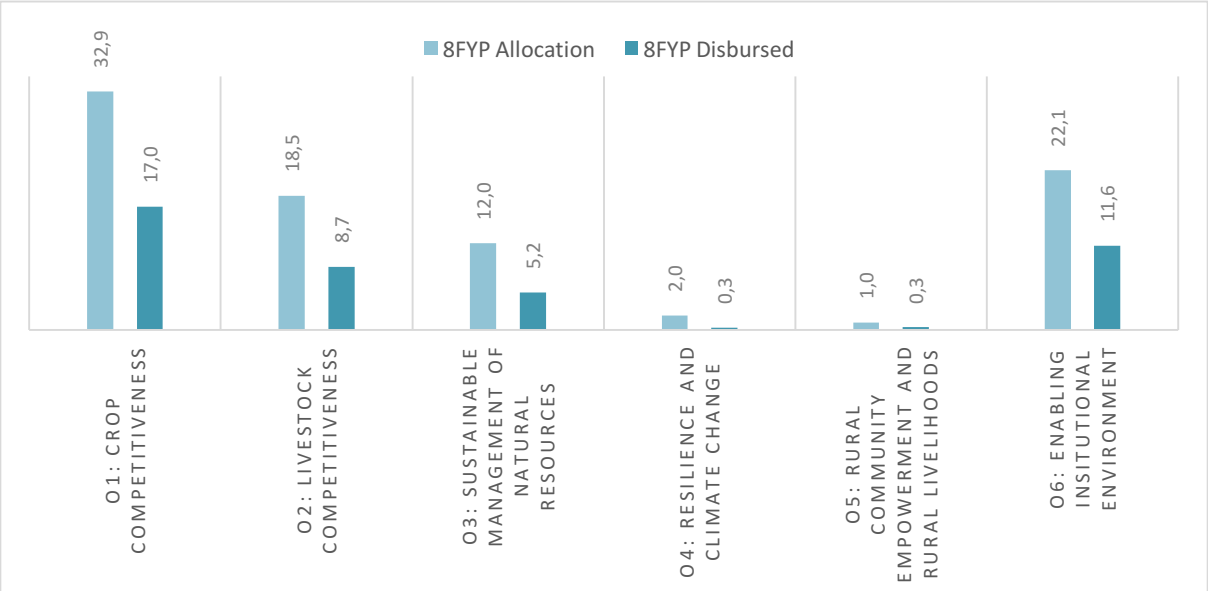
- A ***peak in expenditures can be observed during the second and third year*** of the five-year time frame. The low initial pace may be due to the need to set up implementation mechanisms, while the reduced pace during the fourth year seems to be mostly related to the limited release of funds from the MOF.

Figure 5 – MAF cumulative disbursement (million OMR) in the 8th FYP



Source: elaboration from MAF data (update: Aug 2015)

Figure 6 – MAF allocation and disbursement (million OMR) in the 8th FYP



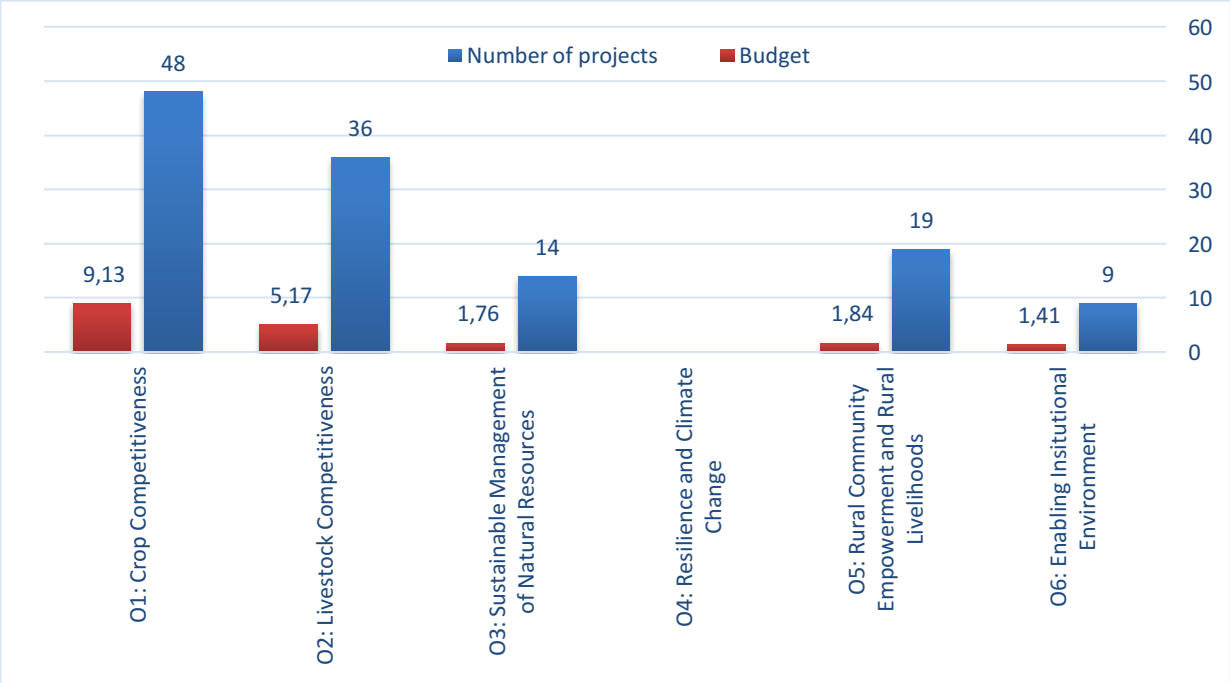
Source: elaboration from MAF data (update: Aug 2015)

3.1.3 Contribution from the Agriculture and Fisheries Development Fund

The Agriculture and Fisheries Development Fund (AFDF) became operational in 2006 as a successor to the Fisheries Research Fund. It receives around 1 percent of agricultural gross domestic product (GDP) in funding directly from the MOF, with additional contributions from the private sector and some additional earnings from intellectual property rights revenues. In general, it is considered highly relevant as a contributor to the agriculture and fisheries sectors and gained further recognition after the global food price crisis for its flexibility in allocating budgets to strategic areas. The AFDF has been given a key role in the SARDS 2040, due to its high potential to drive innovations in the agriculture and fisheries sectors. In fact, the AFDF is considered to be an effective first entry for research, capacity development and pilot approaches not covered by the MAF.

During the period 2011-2015, the AFDF funded and supervised some 126 projects relevant to the SARDS 2040,[8] of an average amount of OMR 147,000. Figure 7 summarizes the classification of these projects along the SARDS 2040 outcomes. This classification indicates that the large majority of AFDF projects represented contributions to production, marketing and biosecurity of crop and livestock production (Outcomes 1 and 2 of the SARDS 2040). However, a relatively high number of projects also had a social inclusion focus, namely projects focused on enhancing employment opportunities for women, or on piloting rural development approaches in specific rural areas (Outcome 5). Most projects in the crops sector focused on promoting improved farming technologies and good practices as well as research on high-value crop varieties (IO 1.1). A significant number of projects focused on livestock production and marketing of livestock products (IO 2.1), as well as the enhancement of animal health conditions (IO 2.4). Around 12 projects dealt with improving rural livelihoods (IO 5.1) and 9 projects on improving information on agricultural production (IO 6.4).

Figure 7 – Relevant AFDF projects (2011-2015) and budget (million OMR) classified by SARDS outcomes



Source: elaboration from AFDF data

[8] The total number of projects implemented was 211, including 85 for the fisheries sector, which represents about half of the budget (with an average amount of OMR 220,000).

4. The SARDS 2040 Investment Plan

Linkages with the SARDS 2040, current investments, main actors, funding, interventions' structure

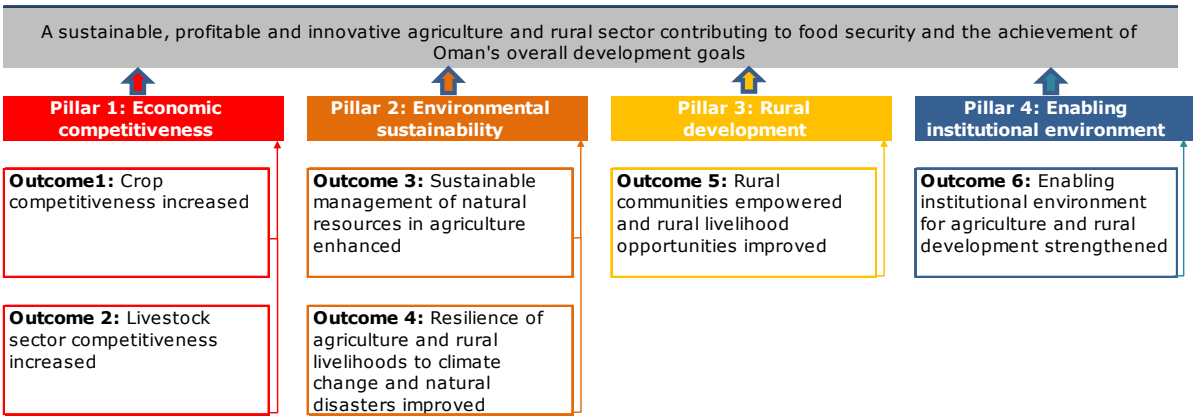
This section is the core of the IP, as it provides an overview of the interventions to be carried out in the 2016-2020 term. More specifically, this section contains:

- an overview of the necessary investments to achieve the SARDS 2040 objectives;
- a summary of the main elements of the investments required in the 2016-2020 time frame; and
- an analysis of what is currently being proposed vis-à-vis the SARDS 2040 objectives.

4.1 Results-oriented planning

The SARDS 2040 IP follows the SARDS 2040 structure. The proposed investments contribute to the SARDS 2040 objectives along the six outcomes and priorities established for each outcome (see Figure 8). The key interventions in the SARDS 2040 are defined by IOs, targets and timelines. This structure enables identification of the necessary investments required for the successful implementation of the SARDS 2040. As such, ***the IP matches the already programmed projects of the 9th FYP with the IOs of the SARDS 2040, and provides recommendations for their prioritization and eventual adjustment in order to better conform to the SARDS 2040 results structure***. As the estimated cost of all the proposed IP interventions might be higher than the available national budget as defined for the 9th FYP, the IP identifies the main implementation priorities for each outcome.

Figure 8 – The SARDS structure, its six outcomes grouped in four pillars



The adjustment of the scope of the initially programmed 9th FYP projects and the setting of investment priorities were carried out by applying a set of criteria as well as taking into account the proposed SARDS 2040 results. In terms of criteria, it is assumed that all interventions funded through public funds (completely or partially) are **relevant** (the interventions are in line with SARDS 2040 priorities), **effective** (investments are capable to produce the expected results) and **efficient** (investments maximize results with available resources). It is also expected that public investments leverage private sector initiatives, contributing to the achievement of SARDS 2040 results rather than introducing crowding-out effects.

4.2 The building blocks of the Investment Plan

Investment in agriculture and rural areas in Oman does not depend exclusively on the Government's financial efforts. In reality, the Government, through the implementation of its 9th FYP, should

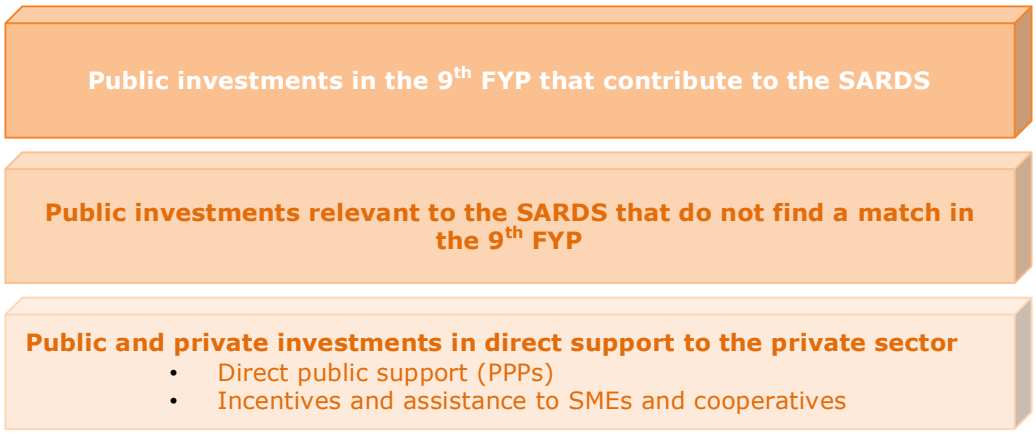
leverage much larger investments from the private sector. In order to provide an analysis of this complementarity of investments, the IP is based on three building blocks (see Figure **9**):

- **Public investments in the 9th FYP that contribute to SARDS 2040**. The MAF interventions designed for funding within the 9th FYP are reclassified along the SARDS 2040 outcomes and IOs. Interventions with the highest relevance and need for immediate action are identified as a priority, while less relevant interventions are given a relatively lower priority and their budget reallocated to priority areas that emerged during SARDS 2040 formulation that were not yet budgeted (see following point).

- **Public investments relevant to the SARDS 2040 that do not find a match in the 9th FYP.** These are priority areas of the SARDS 2040 that require interventions from the MAF, MRMWR, MECA or the AFDF, which do not have a corresponding budget under the MAF's 9th FYP. The budget for these activities will have to be allocated during the implementation of the 9th FYP, as new funds might become available or identified within ministries other than the MAF.

- **Investments in direct support to the private sector:** These can be: (i) direct public support through PPPs; or (ii) incentives and assistance to small and medium enterprises (SMEs) and cooperatives. The currently planned PPPs are discussed within the framework of SARDS 2040 priorities and their contribution to the overall expected investment from the Government of Oman. Outcome 6 describes the possible improvements that can be made in the system of incentives for private investment (regulatory framework, subsidies, improvements in financial products, etc.).

Figure 9 - Building blocks of the IP

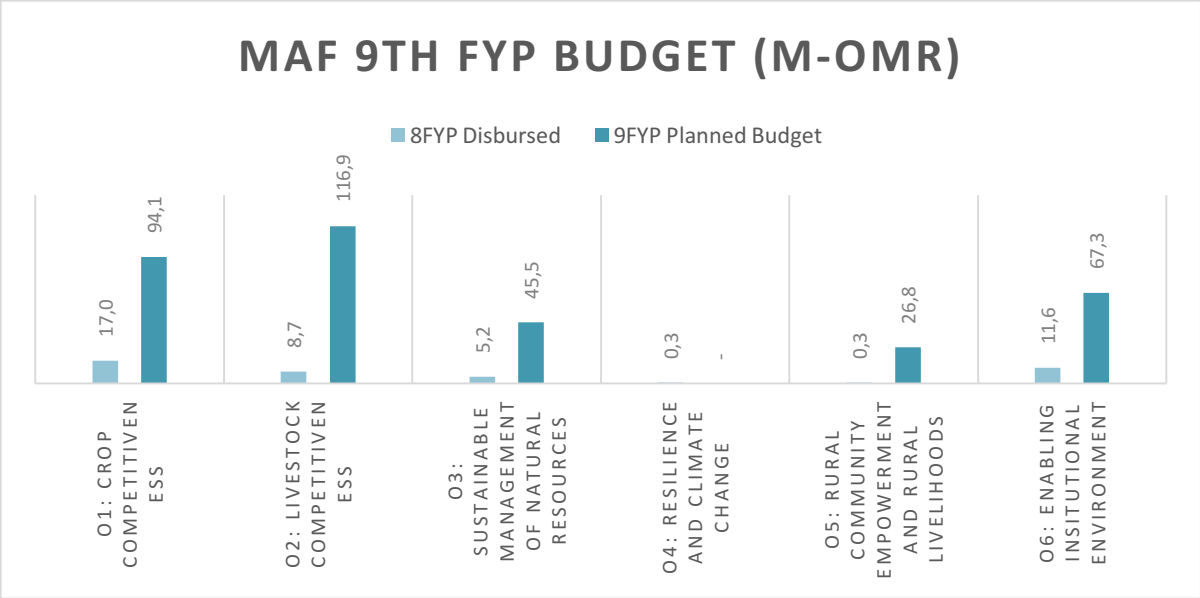


The overall budget of the IP will be composed of the amount requested for financing of the 9th FYP and an identification of investment gaps for which resources will need to be mobilized during implementation.

4.3 Summary of the priority interventions of the SARDS 2040

This section presents the planned public interventions in agriculture and rural development for the next five years that fall within the scope of the SARDS 2040. For each SARDS IO, the section provides one introductory paragraph, the proposed approach to investment and a summary of relevant topics for policy dialogue and institutional coordination. The introductory paragraph discusses: (i) how the 9th FYP addresses what is proposed in the SARDS 2040 under each IO (including what is missing); and (ii) the main investment priorities in the next five years. The subsequent paragraphs contain a budget per outcome and IO, which can be found in detail in Annex II (a summary of budget per outcome is provided in Figure 10 and for the 9th FYP only, also in Annex I – Table 1).

Figure 10 – 9th FYP: MAF requests for funds (OMR) versus 8th FYP disbursement



Source: elaboration from MAF data based on budget submitted to the Supreme Council for Planning; 8th FYP disbursement update: Aug. 2015

4.3.1 Outcome 1 – Crop sector competitiveness increased

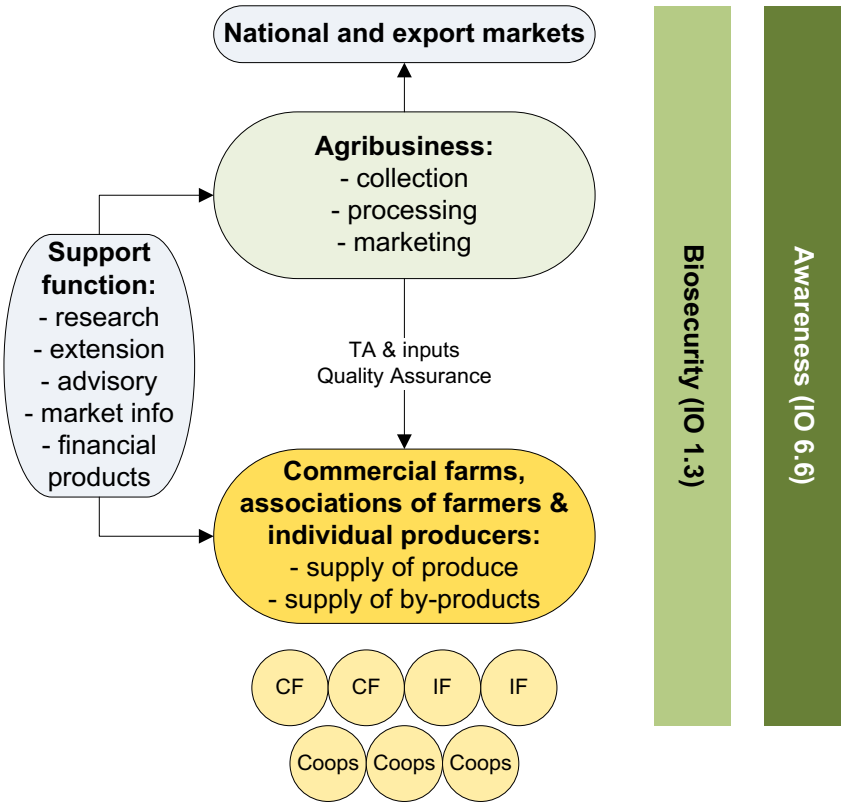
The achievement of Outcome 1 depends on the development of three IOs. An analysis of the projects programmed under the 9th FYP resulted in a mapping of 54 projects that contribute to Outcome 1 for a total budget of OMR 94.0 million (see detailed list in Annex II – Outcome 1). There are seven PPPs and a number of private sector investment projects envisioned to contribute to this outcome's achievement. According to additional information received from the Directorate General of Marketing and Investment for Agriculture and Livestock (DGMIAL), the private sector seems keen to play an active role in some aspects of production (fruits and vegetables) and in certain locations (Al Batinah), while it is largely absent in post-harvest and processing activities or in the production of planting materials. Policy and incentives for these activities might need to be given priority in the next five years.

The proposed investments need to respond to the sector development model proposed in the SARDS 2040 as illustrated in Figure 11. The SARDS 2040 aims to increase water productivity and the overall value of the country's production by producing high-value crops, promoting widespread adoption of good agricultural practices (GAPs), reducing losses and adding value through packaging and processing, differentiation, branding, etc. A number of PPPs will have the role of establishing post-harvest handling facilities that provide commercial incentives to small and medium farmers to supply high-quality products (GAP certified, of adequate grade, with adequate post-harvest handling, etc.), and comply with national operational standards, preferably adopting higher voluntary standards. Opportunities for processing new products resulting from these investments should also be sought (e.g., canned and frozen vegetables, livestock fodder, etc.). Nevertheless, farmers are the central focus of this outcome's interventions and investments, and will be supported by the MAF and its partners (e.g., Riyada, research institutions) to improve production standards to serve markets that offer premiums for differentiated products (domestic markets, fruit and vegetable exports, packaged products, organic, GAP or Integrated Pest Management [IPM] certified, etc.).

Investment priorities should focus on establishing post-harvest infrastructure in key production areas (e.g., Al Batinah) and supporting farmers to supply these facilities with the required quality standards. Investments under Outcome 1 should also be coordinated with efforts around achieving Outcome 3, and therefore target farmer groups engaged in improving water resources management (e.g., in a given aquifer of Al Batinah or in *aflaj* irrigation system being modernized).

Priority also needs to be given to countrywide interventions in biosecurity that ensure that the productive capacity of key crops (e.g., dates, coconuts) is not compromised.

Figure 11 - Summary of the programme proposed by the SARDS 2040 for the development of the crop and horticulture sector



CF = commercial farms; IF= individual farmers; Coops = cooperatives

IO 1.1 – Technical and organizational innovations promoted, high-value varieties developed, crop yield and nutritional quality improved

Public investments: The MAF interventions under this IO are dispersed throughout 17 projects implemented by the DGAD (OMR 38.3 million), plus ten projects implemented by the DGALR (OMR 15.6 million). Many of the DGAD projects comprise extension activities (and input distribution) in areas that fall within SARDS 2040 priorities (GAP, IPM, etc.). The objectives of the ten projects implemented by the DGALR are also well aligned and cover the aims of the SARDS 2040. Some priority will need to be given, within the OMR 15.6 million budgeted, to the development of high-value, water-efficient and locally adapted varieties of key crops, tissue propagation and enhanced production techniques (to increase water productivity and product value). Of the 27 planned projects that fall under this IO, a significant portion will focus on deploying improved date palm seedlings and replacing and renewing palm in selected *aflaj.* On date palms specifically, it is worth noting that the Diwan of the Royal Court has started implementing the *One Million Date Palm* project, with the technical advisory collaboration of the MAF. A large number of public interventions under this IO are also contributing to improving biosecurity in the country, and therefore also contributing to achieving IO 1.3 (see below).

Private sector: The planned PPPs on nurseries (whose scope will depend on the feasibility studies) are complementary to all of the activities.

Recommendations:

- ➔ *The approach to investment*:
  - A prerequisite for the foreseen research projects on crop improvement is a study on the most suitable varieties in the country in terms of: (i) market acceptance and value; (ii) water efficiency; and (iii) salinity tolerance. The study will allow for the identification of ***crops and, in some cases, varieties, having the highest potential per region***. Subsidies and technical assistance from MAF projects under this IO should target farmers who adopt selected crops and be conditioned to the

adoption of selected agricultural practices, which should be periodically adjusted as research results evolve.

- Programmed research projects should include the development of water efficient varieties, ensuring significant linkages with the interventions under Outcome 3 (see detailed list of planned projects in Annex II).
- In addition, for the implementation of some of the planned projects *(e.g., Development and Provision of Agricultural Extension Services* or *Application of Good Agricultural Practices*) international expertise should be mobilized to: (i) train MAF staff and researchers on the use of cutting-edge production technologies and practices suitable for the country; and (ii) design and supervise pilot interventions and establish enforcement mechanisms for a ***revised incentives framework*** (see IO 6.2).
- Implementation of the projects planned under this IO, which aim to enhance the production value of existing varieties and introduce new high-value varieties, will need to establish synergies with the projects engaged in identifying and supporting model farms, since research should be, at least partially, conducted on those private farms that will receive extension support in GAPs and marketing.
- ***Incentives/subsidies and extension activities should be geared to the use of good planting techniques and planting materials*** and should ***target farmers having the highest potential*** for the development of the sector (e.g., young and educated farmers with an interest in particular crops and technologies).
- ***Priority target groups*** should include ***farmers who are able to participate in all tiers of the value chain***, and more specifically those willing to supply the new or existing sorting, grading, packaging and cooling facilities or processing units (IO 1.2) to guarantee that demand is met with products meeting quality standards.
- Similarly, subsidies should be ***provided through organized farmer groups*** in order to exploit cross-learning and potential synergies (this requires changes in the associations law – see IO 6.1).
- Subsidies should be ***provided within a package of practices***, aimed at reaching one of the SARDS 2040 objectives (e.g., adoption of GAP, IPM, water-saving and environmentally friendly technologies, adequate crop establishment, etc.).
- Interventions would be more efficient if focused around a ***few key technologies and regions*** (i.e., according to the suitability of the crops to the different regions of the country and to market demand).
- Extension services should ***encourage farmer-to-farmer learning*** through the selection of model farmers, study tours or other practices.
- ***Adoption of new practices must be monitored*** for farmers receiving public support and a database built and updated; hence projects must include budget provisions for building this database and monitoring activities as a priority.
- All IPM-related projects should only ***provide subsidized inputs or any other type of financial assistance to farmers adopting IPM***. A database of the farmers and farm areas benefiting from IPM projects would need to be developed and a monitoring and analysis system set up so that those not adopting IPM practices would be excluded from receiving assistance (this requires setting up a geographic information system [GIS] and associated farmer database as a first step).
- Projects requiring certification (e.g., organic agriculture) need to partner with institutions having the mandate to develop and train certification entities (e.g., Riyada).
- Selected model farms should liaise with ***incubators,*** which assist in business planning, accessing credit and assessing market demand (varieties, quality, etc.). Partnering with Riyada might be key.
- As there has been little private sector interest in investing in the production of planting materials, targeted incentives for stimulating investments in this area will be required. Projects contributing to this IO need to target farmers who have the potential to become seed/planting stock multipliers to address the problem of the country's currently limited planting material production capacity. Demand for planting material is strong for many reasons, including the *One Million Date Palms* project and the import restrictions on planting materials for biosecurity reasons.
- Projects aimed at ***raising awareness*** (e.g., *Mobile Extension Units*) should focus on all stakeholders of the value chain (farmers, processors, consumers, etc.) and be comprehensive (agrochemical use, GAP, traceability, labelling, etc.).

➔ *Topics relevant for policy dialogue and institutional coordination:*

- Extension activities should be integrated into an overall agricultural national innovation system as programmed under Outcome 6, also integrating PPPs and the

One Million Date Palms project (Diwan of the Royal Court) as well as the actors involved in the implementation of IO 3.1. New farms/agribusinesses should be integrated into the innovation system and incubated to become model businesses in the country.

- The importance of working with farmer groups has implications for the content of the Law on Associations, which would need to be adapted in order to permit the creation of a number of relevant farmer/business organizations.
- Making the current system of incentives *smarter* may require legal adjustments and territorial planning (choice of adequate technology packages per region) that should be supported by specific studies (plus a change in functions of MAF staff at governorate and *wilayah* level responsible for the implementation and supervision of agricultural programmes).
- The establishment of model farms, the reform and piloting of new incentives systems, the creation of databases and GIS or the development of planting material farms would gain from the involvement of research-related institutions such as the AFDF, SQU or The Research Council (TRC).

IO 1.2 – Post-harvest losses reduced, product market quality improved, product value added developed and market opportunities enhanced

Public investments: The large majority of the nine projects under this IO are the responsibility of the DGMIAL. In addition to the six projects specifically focused on marketing, the MAF has planned two additional post-harvest projects (for a total of OMR 8.0 million, proposed by the DGAD and the DGMIAL), and one research intervention on the development and transfer of food processing techniques (OMR 1.0 million) for various vegetable and fruit products, and capacity development. As the achievements within this IO will largely depend on the achievement of the previous IO 1.1 (good planting material and adequate on-farm practices), it is important that the public resources allocated to the interventions under IO 1.2 target the same stakeholders as the remaining projects under Outcome 1. Such a systematic and comprehensive approach would **reinforce entire value chains**. In general, investments under this IO include a mix of studies, campaigns and knowledge base improvements well aligned with the SARDS 2040 (Outcomes 1 and 2). However, there seems to be little focus on the need to improve the knowledge of both farmers and technicians on post-harvest handling and care technologies (forced air, hydro-cooling, washing procedures, grading and sorting, dehydration and rehydration of dates, packaging, temperature and humidity management). Additional investment might be needed for branding, labelling and traceability and the adoption and enforcement of international quality standards. While this should build on the experiences of the Ministry of Commerce and Industry (MOCI), and done in cooperation with the Riyada (in its capacity to assist the agriculture and rural sector), in order to create synergies and economies of scale with these two institutions' interventions, the MAF might need to allocate some additional resources to address this priority. In addition, the investment also needs to include awareness campaigns targeting consumers on biosecurity and food safety, and producers/processors on the adoption of established quality standards.

Private sector: Interventions in agroprocessing are mostly programmed under a PPP modality, with the exception of investments in research on food processing techniques. The PPP modality has significant potential to benefit from private investments to achieve the aims of the SARDS 2040.

Recommendations:

➔ <u>*The approach to investment:*</u>

- Similar to the approach recommended for IO 1.1, the interventions should ***target farmers (groups of farmers) with the highest potential*** to benefit from public investments on sorting, grading, packaging and cooling facilities.
- The projects should ensure collaboration with the interventions on subsidies and extension services planned under IO 1.1 to ensure the supply of adequate quality products to the new/improved sorting, grading, packaging and cooling facilities.
- A sound training and ***capacity development plan*** for MAF staff and post-harvest facilities workers (training of trainers) on advanced post-harvest practices should be included in one of the projects. MAF and staff of post-harvest facilities should train and supervise suppliers on on-farm and post-harvest care and handling. Similarly, programmed PPPs need to include in their business plans adequate training of staff. They should also provide learning opportunities for civil servants, potential investors, university students and other possible private technical service providers.

- Publicly funded activities should be coordinated with private investment in post-harvest facilities, including cooling storage facilities[9] that should complement and stimulate private entrepreneurship and ***avoid the risk of crowding out private investments***. Although public investments in infrastructure are foreseen, efforts to ease entry of the private sector in the agrofood sector (IO 6.1) should always be included in the public intervention priorities.
- PPPs in fruit processing should, as much as possible, ensure ***linkages with*** new/improved sorting, grading, packaging and cooling facilities.
- PPPs are aimed at attracting private investment mostly for processing, a tier in the value chain that does not seem to receive much attention from private investors yet. However, they will need to be ranked by priority, given the budget constraints in the country. The setup of one or two model enterprises could serve as a model for future fully private endeavours.
- The SARDS 2040 emphasizes the need to substitute date cultivars and enhance date quality by moving away from the existing mix of 'table' and 'for-processing' varieties towards a quasi 'table-only' variety. Approved private investments (including large PPPs) should give priority to the processing of 'table' dates. Investments aimed at processing lower quality dates should be scaled according to this expected reduction in the volume of 'processing' variety dates, and consequently equipped to process additional raw material (e.g., coconut by-products to produce alternative sources of animal feed).
- Among the envisaged PPPs, the MAF has identified the opportunity for two additional projects – one on improving handling and transportation and one on the establishment of collection centre networks – both focusing on a range of products from horticulture, livestock, poultry and honey.
- All projects should exploit and strengthen collaborations with Riyada (or specialized private service providers) to support the preparation of business plans for collection networks and associated facilities, and for branding, labelling and adequately packaging agricultural products.
- Priority of the interventions foreseen under this outcome should be given to consultancies and studies that facilitate ***improvement of the legislation on marketing***, including grading, improved certification procedures, improved licensing processes and public awareness (as in Outcome 6, consumption of Omani products, IPM, etc.) and ***agribusiness development***.

➔ *Topics relevant for policy dialogue and institutional coordination:*

- An essential dialogue between the MAF and the MOCI needs to be held in order to improve legislation on marketing, including ***grading, certification procedures, and licensing processes***.

IO 1.3. – Stringent food safety and biosecurity measures for crop products enforced

Public interventions: Most investments under this IO are dedicated to the control of pests that threaten the sustainability of key crops in the country (biosafety). The DGAD has planned 13 relevant interventions for a total of OMR 21.2 million (including projects relevant to other IOs). The DGMIAL has also planned three projects under this IO, for some OMR 4.0 million. The DGALR complements these interventions with two projects totalling OMR 3.3 million, focusing on the safe use of pesticides and on better IPM practices.

The projects under this IO are related to the control of plagues that seriously endanger sector sustainability (weevil, dubas bug, Panama disease). Hence its **main focus is on the inventory/surveillance of pests** and on actions directly under the control and implementation of the MAF (e.g., modern and periodic spraying enforced by the MAF). It distinguishes itself from IO 1.1, which focuses on direct incentives to farmers for the adoption of IPM, which should be part of an agricultural practices package to increase crop productivity. Projects on IPM under IO 1.1 should be reformulated and included in a ***smart* incentives mechanism.**

[9] Envisaged within the DGMIAL, a project entitled, "Create a sorting and grading, packaging and cooling farmers Batinah" (planned budget: OMR 6.0 million).

Recommendations:

- ➔ *The approach to investment:*
  - Consultancies for the implementation of effective traceability systems should be given importance as ***traceability*** is key to enforcing strict food safety measures and improved marketing
  - ***Awareness campaigns***. Interventions should be complemented by awareness campaigns and knowledge sharing between farmers on the negative impacts of agrochemicals on biosecurity, food safety, human health and the natural resources base (establishing linkages with IO 6.6).
  - ***Advocacy***. The MAF should take an active role in the Food Safety Committee and advocate the strict enforcement of biosecurity regulations. Specific coordination with the Ministry of Health (MOH) and MOCI (IO 6.1) is required.

- ➔ *Topics relevant for policy dialogue and institutional coordination:*
  - An essential dialogue between the MAF and the MOCI needs to be held in order to improve legislation on traceability and food security regulation enforcement (see IO 2.4 for more details).

Main partners in the proposed interventions in Outcome 1

Intermediate outcome	Intervention	Main partners
IO 1.1	Development and testing of crop varieties and optimal planting techniques	SQU, Diwan of the Royal Court
IO1.1	Identification of the crops and, if relevant, the varieties with highest potential per region	SQU, Diwan of the Royal Court, Civil Society Organizations (CSOs)
IO 1.1	Identification of GAPs for the country	SQU, Diwan of the Royal Court, CSOs
IO 1.1	Revision of the incentives framework	MOF, CSOs
IO 1.1	Certification (GAP, IPM, organic, etc.)	MOCI, Riyada
IO 1.1	Establishment of new groups of farmers to supply to facilities adding value to production	CSOs, Riyada
IO 1.2	Training and capacity development for MAF staff and workers from post-harvest facilities	Ministry of Manpower (MOM), Riyada
IO 1.2	Assistance in the preparation of business plans for producer networks and cooling, storage and processing facilities	Riyada
IO 1.2	Improved branding, labelling and adequate packaging of agricultural products	Riyada
IO 1.2	Establishment or improvement of traceability, grading and certification regulations	MOCI
IO 1.3 (partly 1.2)	Campaigns for both consumers and producers/processors on the adoption of quality standards	MOCI, Ministry of Higher Education (MHE), MOH
IO 1.3	Establishment or improvement of biosecurity and food safety regulations	MOCI, MRMWR

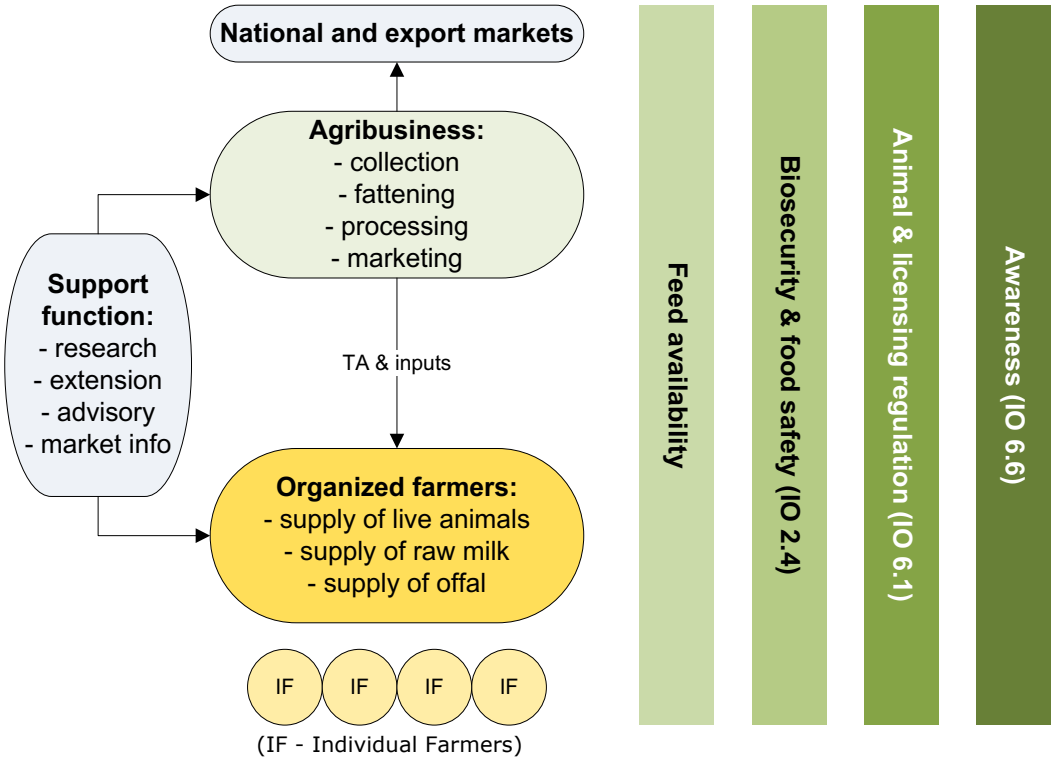
4.3.2 Outcome 2 – Livestock sector competitiveness increased

The achievement of Outcome 2 depends on the development of four IOs. An analysis of the projects programmed under the 9th FYP resulted in a contribution of 45 projects[10] to Outcome 2 (including some that contribute to other IOs) for a total budget of OMR 116.9 million (see detailed list in Annex II – Outcome 2). The private sector seems keen to play an active role in investing in animal production, particularly the poultry sector, thanks to quick returns on investment. In addition to a number of private sector requests to carry out investment projects, the MAF has identified the opportunity to establish ten large PPPs, some of them under consideration of the Oman Food Investment Holding Company (OFIC).

These proposed investments need to respond to the red meat and dairy sector development model proposed in the SARDS 2040 as illustrated in Figure 12, and for the poultry sector in Figure 13.

[10] This includes also two additional projects ("National Livestock Training Centre" for IO 2.1 and "Rehabilitation of quarantine centre" for IO 2.4) identified by the Directorate General of Livestock Wealth (DGLW), initially not included in the list of projects for the 9th FYP.

Figure 12 - Summary of the programme proposed by SARDS 2040 for the development of the livestock sector (red meat and dairy)[11]



The SARDS 2040 aims to increase the commercialization rates of the existing primary production (including offal) and maximize value addition for animal products, while ensuring the environmental sustainability of any operation. A number of PPPs will have the role of providing commercial incentives to small- and medium-sized farmers (including commercial farms and associations/cooperatives) by: (i) enabling raw material/live animal collection and processing; (ii) finding marketing channels for the final products; and (iii) promoting locally grown animal products in Oman and abroad. Investments of the MRMWR in slaughterhouses, together with the enforcement of biosecurity and food safety regulations, will also provide opportunities for improving the quality of meat supplies along with offal collection for further processing by the national industry (skins and hides, intestines and other offal). Opportunities for processing new products within new and existing facilities should also be sought (e.g., sausages, pet food, etc.). Production standards required by the agribusinesses should be made known among livestock farmers and advisory services tailored to achieving these standards. In this effort, the MAF should draw on expertise and collaboration with its partners, including Riyada and TRC, and other research institutions. Any public financial support (e.g., subsidies, soft finance) should be conditional to compliance with industry standards. Advocacy activities for agribusinesses should promote price premiums for quality raw material (especially raw milk), or price deductions for lower quality, so as to create incentives for farmers to improve their production and handling practices.

Investment priorities should be driven by the need to: (i) ensure proper cold chain management infrastructure in the areas with high concentrations of livestock; (ii) organize raw milk (cattle and non-cattle) collection schemes for small- and medium-scale farmers to supply the national dairy plants; and (iii) add value to animal products (e.g., premium meat cuts, offal valorisation, etc.). Upstream in the value chain, improvements should focus on breeding and feeding practices on farm and raw milk hygiene, while downstream, agroprocessors will have to adopt international food safety standards (ISO 22000 series). Hence, the investment priorities that enable the achievement of Outcome 2 rest with the establishment of an aggregation function within the chain (e.g., milk collection systems, feedlots, etc.) Ultimately, sound knowledge of technical factors that impact on the safety, quality and value of animal products, an appropriate infrastructural support base, proper logistics arrangements, good stakeholder interaction and effective government support services are prerequisites to gaining market access, reducing losses and increasing returns to farmers.

[11] Poultry is a vertically integrated operation, hence not fitting in the production scheme illustrated in the Figure.

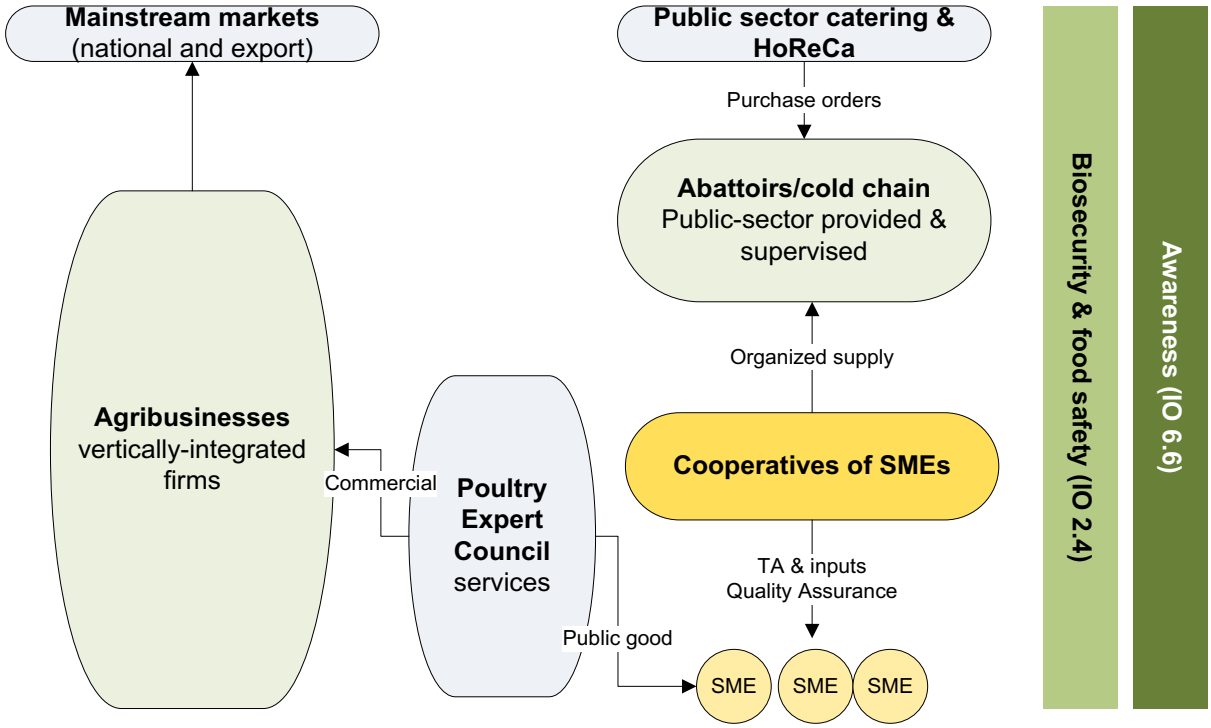
Geographical priority on ruminant production, animal health, feed production and processing should be given where: (i) the potential for the sector's development is greater (large production aggregating investments in place, together with a livestock concentration capable of sufficient supply); (ii) there is potential for product differentiation based on the region of production; and (iii) the need to improve environmental sustainability is the greatest. Hence, although the programmes below could apply to the country's entire livestock sector, priority should be given to Dhofar, as stipulated in the SARDS 2040, and with a special focus on returning animal inventories to sustainable levels by improving animal productivity and commercialization rates and maximizing product valorisation in-situ.

In terms of the **poultry industry**, investments in abattoirs serving poultry cooperatives should be prioritized. Therefore, areas with high concentrations of SMEs (broiler operations) should be targeted first. With the anticipated expansion of large poultry operations, high production costs will be a challenge for SMEs operating in the sector. High investment and fixed costs, along with very low performance, will force most of the SMEs to quit the sector. These SMEs may be supported in their self-organization and in consolidating their production and marketing capacities (e.g., by forming cooperatives), including in joint purchases of inputs and equipment and marketing. The **SMEs** organizing into a cooperative to jointly run an abattoir and market their products need to be supported by the Government (e.g., provision of an abattoir, advisory services, financial products). If supported with adequate policies, such cooperatives can quickly improve their efficiency and, as a result, reduce production costs. The country has already had some successful experience with farmer cooperation.

In the medium to long term, the reference model for the poultry sector would be two-fold. On the one hand, there are the vertically integrated agribusinesses, supported by the Independent Poultry Expert Council for technical and strategic advisory on a commercial basis. On the other, with a shrinking market share, poultry cooperatives, supported by public investments in infrastructure (focus on abattoirs) and free advisory services from the Poultry Council, will market mostly to public catering needs as well as to the private hotel and restaurant catering (HoReCa) sector (see IO 2.2 for more details and Figure 13).

The development of the **apiculture value chain** requires small public investment efforts, but should also be seen as a relevant industry in terms of agricultural GDP diversification, export promotion and rural development.

Figure 13 - Summary of the programme proposed by SARDS 2040 for the development of the poultry sector



IO 2.1 – A more productive, market-oriented and sustainable red meat and dairy industry developed

The interventions and investments foreseen for the development of the red meat and dairy industries can be clustered into four areas for which the MAF has budgeted interventions:[12]

(i) Improvement of rangeland use and management - The 9th FYP foresees **public interventions** in rangeland use and management (five projects), led by the Directorate General of Livestock Wealth (DGLW). A thorough assessment of the current state of rangelands is needed before any investment intervention. Modern remote sensing technologies can reduce the cost of the survey and improve the accuracy of analysis.

(ii) Ensuring high-quality, sustainable and cost-effective animal feed base – The SARDS 2040 establishes three main sustainable sources of animal feed: (i) use of agriculture by-products (e.g., dates, coconuts); (ii) hydroponics for forage production (e.g., alfalfa); and (iii) animal feed imports. The foreseen **public investment** comprises an integrated legal framework and system to control the quality of the raw materials used for feed production as well as research on alternative and efficient sources of feed production and supply systems. **PPPs** dedicated to the provision of imported feed and the use of local agriculture by-products have been programmed by the Government.

(iii) Improvement of national livestock production systems – Animal feed as well as energy- and water-efficient livestock production require adequate livestock management, including: breed improvement; adequate animal housing; pathogen/contaminant diagnosis equipment; and the use of renewable energy sources. These are covered through **public investments** in the 9th FYP projects dedicated to extension, strengthening livestock SMEs and improving livestock production systems.

(iv) Upgrading of value chains and increasing value addition - According to the SARDS 2040, this requires a review of food safety regulation, capacity building of staff, managers and value chain operators, as well as investment in product aggregation and cold chain infrastructure (e.g., abattoirs and slaughterhouses), and the establishment of processing units of various scales in line with demand from domestic and international markets (e.g., camel dairy products, soft leather production, etc.). The DGMIAL has planned **public investments** in this area with two projects, but most results can be achieved through private sector investment and through coordination with other national institutions (e.g., the MRMWR). **PPPs** are planned for the establishment of abattoirs and cold chain infrastructure targeting SMEs.

Recommendations:

➔ *The approach to investment:*

(i) Rangeland management:

- Define and agree with the *wilayat* institutions, population and herders **a *Master Plan for land use*,** firstly in the Salalah *wilayat* (*Jebel* area) and later for all rangelands in Dhofar, clearly defining rural settlements, tourism and urban areas and grazing land.
- Aiming at Pasture Law enforcement: (i) define with grazing communities and follow up on the ***implementation of pasture use management plans;*** (ii) when subsidizing investment, prioritize those foreseen for pasture use management plans (e.g., fenced-off areas, pasture rotation, planting of trees, seeding, etc.) or ***make subsidies conditional to the existence of an effective pasture management plan;*** (iii) consider penalties for non-compliance with the plan; (iv) produce seedlings and invest in plantations (and respective fenced-off areas) where management plans are being followed; (v) complement grazing with innovative, efficient feed production technologies (see below); and (vi) facilitate linkages of herders with providers of high-quality fodder and fodder crop seeds.
- As foreseen in the 9th FYP project description, the appropriate supervision and targeting of interventions will require ***baseline assessments (size and quality) of the current pasture area*** and should make use of modern monitoring technologies such as remote sensing of land use and grazing patterns.

(ii) High-quality and cost-effective animal feed base:

- ***Prioritize activities on quality control of feed and feed ingredients***, including strengthening laboratory infrastructure to evaluate feed quality

[12] Specific SARDS 2040 background documents provide details on livestock development models being proposed.

and safety, which the project already programmed,[13] as most raw feed material needs to be imported.

- ***Invest in research on alternative animal feed production, storage and supply systems***. This should be done directly with farmers involved in other activities supported by the Government, particularly those with breeds that can produce differentiated meat and/or milk (e.g., indigenous breeds of camels and goats) according to market quality standards. The research should also focus on producers having the potential to supply formal markets, preferably with differentiated products (e.g., packaged Omani goat milk).
- ***The PPP for the transformation of date residues into fodder*** (classified under IO 1.2, but contributing also to IO 2.1) is expected to invest in infrastructure and become an example for the country on how horticulture by-products (e.g., coconut) can be used in animal feeding. It ***should be used as a model*** and for study tours for private entrepreneurs.
- ***Improve modern knowledge dissemination among farmers coupled with incentives for adoption.*** The MAF projects planned for the 9th FYP, and dedicated to providing technical and financial support to farmers, should set up model farms featuring efficient water use on farm and in fodder production (e.g., hydroponics, fog catchment, drought-resistant varieties). Champion farmers, who could later train other farmers, could benefit from exposure to international experiences on the matter (e.g., study tours). Incentives from the Government should be targeted to promote highly efficient in-country forage production (this would also require reducing price distortions on forage, e.g., from free water use, and enforcing the ban on exports).
- ***In terms of feed imports****,* as long as availability is guaranteed, its sourcing will have limited impact on the agricultural GDP; hence, public or private investments in the production of fodder outside Oman's borders should not be a priority. However, the Government should engage in studying alternative possibilities to secure sustainable feed supplies (e.g., futures contracts, acquisition of a trading company). All interventions in large animal feed production operations outside Oman should ***respect the principles for Responsible Agricultural Investment in Agriculture and Food Systems*** (RAI) endorsed by the Sultanate of Oman (see recommendations under IO 6.1).

(iii) Improvement of national livestock production systems:

- ***Assess the current dairy potential of specific breeds*** (camel, cattle, and goat) in Dhofar (quantities, quality, geographical location and lactation cycle).
- ***Support integration of farmers into the value chain*** (subsidies and technical assistance). Targeted farmers should be current or potentially reliable suppliers of agribusinesses. Targeting criteria could include proximity to collection or processing facilities, or capacity (in terms of size, interest, education, etc.) to integrate into value chains.
- ***Organize targeted farmers into groups****.* Farmers should be organized into formal associations to help lower their production costs by bulking procurement (group technical assistance, veterinary activities, feed, etc.) and enhance bargaining power and market access (e.g., small-scale camel dairy cooperative, stable provision of animals for slaughter).
- ***Improve feeding*** (see above section on rangeland management and ensuring a high-quality and cost-effective animal feed base) and establish feedlots for male offspring finishing.
- Implement productivity-centred animal selection programmes that contribute to the genetic improvement of animals for milk and meat production.
- ***Provide incentives based on performance***. Housing for animals, screening kits, genetic material, production inputs, animal hydration equipment, etc., should be given based on performance and compliance with good practices. Possible criteria include: animal identification and vaccination; adequate animal weight-gaining patterns; compliance with

[13] Reference is to the "Quality control of feed" project, planned by the DGLW, for OMR 2.0 million.

rangeland management plans; adequate water provision for animal hydration; milk price premium based on quality, etc.

- ***Focus research programmes on the improvement of local breeds towards higher milk and meat productivity*** and investigate the effect of different mineral supplements on pregnant and lactating animals and diet (different proteins and energy) on animal performance.
- ***Invest in capacity development and knowledge management (including knowledge sharing events)***. Strengthening the capacity of the MAF staff and its partners to organize and develop value chains (e.g., the constitution of a council of experts to work alongside the MAF, study tours, advisory services), contract consultants for the reformulation of the current incentives scheme and target beneficiaries should be given priority and can be financed through the budget allocated to existing projects (e.g., *Improvement of Livestock Production Systems* or *Enhancement of Small And Medium Livestock* projects*)*. Simultaneously, a national livestock training centre should be created to centralize, systematize and disseminate state-of-the-art knowledge (international but mostly generated in the country's different institutions) related to animal husbandry, breeding and provision of material for artificial insemination. The centre should run experimental/demonstration activities directly with farmers.
- ***Organize on-farm demonstrations run by trainers-of-trainers within a given community****,* on model farms, piloting new technologies and a comprehensive set of good practices (animal health and wealth, feeding, breeding, farm management, raw milk handling hygiene, etc.). At the same time, involve technicians from different areas (veterinarians, inseminators, researchers, extension staff) in formal training programmes.
- ***Ensure that PPPs foresee the employment of adequate veterinarians and animal production technicians to organize the supply of vaccine doses and assist farmers*** in optimizing the quality (hence the value) of the animals delivered to the processing facilities.
- In addition, the country would benefit from the establishment of ***a web-based knowledge portal*** that would gather all the available ***knowledge on primary livestock production, supply chain management, processing and market trends****.*

(iv) <u>Efficient value chains and value addition:</u>

- ***Create a product aggregation function within the value chain to enhance the commercialization and valorisation of domestic animal products****.* Aggregation of raw material calls for proper management arrangements, physical infrastructure (slaughterhouses, cold storage) and access to markets (raw milk collection, cooling systems). Value chain development requires a holistic approach along the chain, i.e., any intervention downstream (e.g., dairy plant) should provide comprehensive support of value chain actors upstream (e.g., support to live production) and foresee complementary investments (e.g., feedlot, slaughterhouses). Investments should be market-oriented and consider a diversification of products (e.g., camel and goat dairy, or high-value dairy products such as cheese, premium camel meat cuts, sausages, leather production, etc.).
- ***Encourage the processing of skins and hides into leather items*** linked to the slaughterhouses where offal is aggregated (as well as in private or MRMWR investments), and in the foreseen large red meat production PPP, possibly acquiring extra raw material from other slaughterhouses in the country (this will require training staff in these slaughterhouses and investing in equipment). Provide soft loans to entrepreneurs or grants to farmer associations wanting to establish animal product processing units. Support market intelligence tailored to these units: provide market information; offer training; or provide access to the existing end market assessment (see IO 6.4).
- ***Develop milk (cattle and non-cattle) collection schemes***, i.e., invest in infrastructure, farmers' capacity development and improved production in terms of productivity and quality (consistent with what is proposed under the *"improvement of national livestock production systems"*, and IO 2.4). Develop a capacity development programme (with experts external to the MAF and possibly in partnership with Riyada) to ***strengthen the MAF's capacities and ensure high standards of technicians in processing***

centres to produce a variety of processed animal source food, applying quality controls, traceability, labelling, branding, etc. Consistent with the approach adopted by the SARDS 2040 on alternative sources of energy, the development of the milk and dairy value chain offers a significant opportunity to invest in off-grid solar energy to reduce the considerable cooling energy costs in this climatic zone (see IO 4.2).

Box – Developing the camel dairy subsector

In the Salalah *wilayat* there is scope for creating opportunities for a group of camel owners to run ***a small-scale dairy operation*** (500 litres per day), producing innovative products like camel milk, cheese or chocolate. This investment is not foreseen in the MAF's investment programme, but requires collection and processing facilities that could be included in the MAF's planned projects or be part of the AFDF and SQU contribution to the sector. Investments in on-farm improvements, on the other hand, could be made by selected breeders and guided by specialized technical assistance. The key factors and required investments for the success of the above-mentioned operations include:

- choice of the appropriate **legal identification of the farmer group** (cooperative, association, private company);
- availability of strong local manager(s): **management capacity** is critical in any dairy operation;
- availability of **technical advice**: camel owners and their workers will need to develop their knowledge and skills;
- provision of **incentives for knowledge dissemination** (tax/fee reduction for farmers acting as trainers);
- establishment of a milk **collection structure;**
- **intensification** of feeding and pasture use (light irrigation of natural grasses), use of agricultural by-products for feed;
- close monitoring of animal health and strict hygiene standards for milk handling;
- **procurement of raw milk based on quality** to create the incentive to change current practices and provide some healthy competition **among herders and processing units; this will also have an impact on herd size and pasture management; and**
- **establishment and staffing of a camel research centre in Salalah** (for new dairy and meat product development, health controls, breeding, feeding improvement, etc.), with the RCA's support and technical cooperation, given its experience on the subject.

➔ *Relevant topics for policy dialogue and institutional coordination*:

- Establishment of a mechanism for the adoption of master plans for land use for rangelands;
- Assessment of policy mechanisms to improve and ensure the provision of fodder (study the adequacy of futures contracts for fodder, compare alternatives with regards to opportunity costs and risks to large investments in fodder production);
- ***Enforcement of the MAF's mandate to control the quality of feed production throughout the country and in all industries;***
- ***Enforcement of biosecurity and food safety regulations*** and development of an effective ***traceability system***, e.g., centralized animal identification, internal quality management systems in processing units, bar coding, etc. (see IO 2.4);
- Revision of the ***legal framework regarding the creation of farmer groups*** and professional organizations (see IO 6.1);
- Development of professional and well-targeted *consumer awareness campaigns,* advocating for the consumption of national products, adoption of biosecurity and food safety regulations, etc. (see IO 6.6);
- Development of professional and well-targeted producer and consumer awareness campaigns advocating and informing on health and production issues and market opportunities (see IO 6.6); and
- Additional interventions foreseen in the SARDS 2040, outside the scope of the MAF, to be advocated by the competent authorities as proposed in IO 6.1, including:
  - (i) improvement of the current system of animal auctions;
  - (ii) development of local marketing outlets for small- and medium-scale dairy and meat production;
  - (iii) private sector investments in innovative dairy products, premium meat cuts and high-quality leather production; and
  - (iv) upgrading of processing facilities not under the MAF's jurisdiction into high-quality facilities and exploring the possibilities to diversify production mixes (camel meat, premium cuts, leather, etc.).

IO 2.2 – National poultry industry competitiveness and sustainability enhanced

Private investments. While there is a lot of interest from the private sector in large-scale poultry operations where no particular investment from the public sector is needed (although there is scope for policy incentives, such as conditional subsidies), smaller-scale private enterprises (SMEs) producing table eggs and broiler meat require urgent support from the Government. This support includes the revision of the Cooperatives Law to allow for cooperatives to undertake commercial activities, providing each broiler cooperative with an abattoir and assuring public/private sourcing from catering (from the public sector as well as from HoReCa) of meat produced by poultry cooperatives, and possible sales of fresh meat by local brands in supermarkets. In addition, a PPP already foreseen for this sector should establish production standards and become a model for the poultry value chain.

Public interventions are not programmed for the sector; however, national poultry producers face certain constraints that could be solved through public interventions. The recommendations below deal with how government interventions could steer the sustainable development of the Omani poultry sector.

Recommendations:

➔ *The approach to investment:*

- ***Constitute an independent poultry expert council*** capable of assessing projects' feasibility, conducting technical audits, licensing SMEs and providing technical assistance to SMEs while building capacities within the MAF. The council will provide the **support function** within the poultry value chain (broiler/layer).
- ***Create a detailed and regularly updated active poultry operations database*** to monitor operational status, performance indicators and biosecurity conditions. This will be the basis for further actions on sector planning, biosecurity control and establishment and adaptation of incentives to gradually improve the country's poultry industry.
- ***Identify existing poultry farms that can be used as a model and provide targeted subsidies for their upgrade*** (introduction of modern technologies, automation, use of renewable energy, adequate flock density, etc.). The independent poultry expert council should assist in identifying such industries and in designing the adequate incentives. These farms should host study tours for operators from the sector.
- Consider the feed requirements of the poultry industry in developing the activities related to **ensuring a high-quality and cost-effective animal feed base** from IO 2.1, namely on the control of feed quality, research on alternative feed sources and mechanisms to guarantee stable supplies.
- ***Speed up and improve the licensing system of abattoirs and integrated cold chains*** for poultry and organize poultry farmers to invest in, and provide raw material to, these slaughterhouses (cooperative businesses would need to be allowed in the country). Priority should be given to investment proposals aimed at: (i) ***enhancing the processing capacity*** (e.g., cuttings, semi-prepared foods, sausages, meat preserves, chicken stock, pet food, processing of edible and non-edible offal); and (ii) ***introducing innovations*** (table eggs enriched with micronutrients for humans, powder eggs). The poultry expert council should provide technical assistance in improving the licensing system as well as in improving the quality and implementation of business plans. Resources from the AFDF could fund a project to test cooperative models of poultry production.
- Speed up and improve the licensing system for a ***grandparent stock farm*** within the country for parent stock production. Also in this case, the poultry expert council should provide technical assistance in improving business plans and their implementation.
- Focus possible poultry research projects (possibly funded by the AFDF) on the study of the genomic potential for adaptation to climate change and the economic traits of indigenous breeds.[14]
- Use possible budgets for professional and consumer awareness campaigns to advocate for the consumption of national products, adoption of biosecurity and food safety regulations, etc. (see IO 6.6).

[14]This may generate opportunities for marketing of local brands of fresh meat.

➔ *Relevant topics for policy dialogue and institutional coordination*:

- Revision of the legal framework that affects the ***creation of farmer groups and professional organizations*** (see IO 6.1);
- ***Revision of the legal framework on biosecurity, food safety and traceability*** and design of ***effective enforcement mechanisms*** (see IO 2.4);
- ***Revision of the existing feed price compensation schemes*** that might favour oligopolistic behaviour and decrease competitiveness in the country (IO 6.2); and
- ***Improvement of the current licensing system*** to speed up and increase the efficiency of business operators and enforce compliance with the biosecurity framework, good performance indicators and rational use of natural resources (criteria for the entrance of new players) (see IO 6.1).

IO 2.3 – Apiculture practices and technologies, organization of producers, value addition and marketing enhanced

Public interventions. The envisioned projects comprise three projects for a total of OMR 3.8 million, proposed by each the DGAD, DGMIAL and DGALR. The interventions are perfectly aligned with the scope of the SARDS 2040 with regards to honey and other apiculture high-value product production and marketing. As some aspects of the proposed interventions are not clear in project descriptions, some recommendations covering these aspects are provided below.

Recommendations:

➔ *The approach to investment:*

- Focus research on identified, ***market-driven innovations on honeybee products and production processes*** (e.g., research productive strains adapted to the Omani climate, develop honey characteristics that suit targeted consumers, diversify honey products). The AFDF research project on honeybees should pilot the development of new, differentiated products.
- Use part of the allocation for the *Breeding and Propagation of Honeybees* project to train MAF personnel and commercial beekeepers on adequate extraction, storage and production of high added-value by-products, using international and national research experts.
- Focus producer support on farms adopting IPM and making a strict use of agrochemicals (IO 1.1), or in specialty locations, such as *Wadi* Dawkah where frankincense trees grow, to create differentiated honeybee products. It is also important to focus support in locations where forage resources exist all year in order to keep healthy producing hives (*aflaj*, different fruit producing areas, etc.).
- Target beneficiaries for technical and financial support based on their access to ***adequate extraction and processing facilities***.
- Subsidize the installation of processing facilities that enable compliance with all food safety regulations and ensure traceability of all products in key producing regions. Partner with Riyada on labelling, branding, capacity building on market differentiation and the search for new market outlets.

➔ *Relevant topics for policy dialogue and institutional coordination*:

- Reform of legislation on food safety and beehive transport that enables and provides incentives for the production and marketing of good quality honeybee products (see IO 6.1).

IO 2.4 – Stringent food safety and biosecurity measures for animals and animal products enforced

Public interventions. There is an ample range of interventions programmed in this field in the 9th FYP of the MAF, which will need to be implemented gradually, according to priorities, and accompanied by enabling policy and institutional reforms.

Recommendations:

➔ *The approach to investment:*

- Move the country towards a more sustainable animal health management system, gradually implementing a reform that ***increases the participation of the private sector and the share of payment for services from farmers and processing units***. Major steps include:

- investing in the upgrade of veterinary education facilities to enable a ***full-fledged veterinary course in the country*** (which in the long term will provide professionals to the public and private sectors);
- gradually ***increasing vaccination and other treatment fees*** until a price is reached that would sustain private services;
- gradually increasing the fees charged for operations in public clinics; and
- investing in new public clinics where animal concentrations are very large and dealing with animal health issues an absolute priority, gradually allowing for the private sector to take over the management of the clinics.

- Design and establish a ***centralized animal identification and on-farm veterinary surveillance*** system (compulsory records management).
- Establish a programme to control widespread diseases such as Brucellosis and Johne's disease. In a first stage and as a one-off countrywide intervention, ***test and slaughter sick animals, offering farmers compensation for losses***. Give priority to the creation of 'disease-free' zones in those areas where investments under IO 2.1, including resources and incentives for farmers, are concentrated (e.g., Dhofar), increasing the potential for the success of animal health interventions. Involve veterinarians from private (public-private) companies in animal identification and disease control, and, through legal instruments, attribute the responsibility to processing units for ensuring the processing of only healthy animals.
- Equip and build the capacity of ***national metrological laboratories'*** staff to conduct all the necessary tests foreseen by international requirements (ISO 17025 accreditation).
- Gradually reinforce ***quarantine capacities*** based on sound criteria, (e.g., the number of animals handled per year, imports from countries that meet most of the national demand, borders with countries with poor animal health control, animals that will cross important producing areas of the country, etc.)

➔ <u>*Relevant topics for policy dialogue and institutional coordination*</u>:

- ***Alignment of biosecurity and food safety regulations with international standards*** (World Organization for Animal Health [OIE] and *Codex Alimentarius*, besides GCC);
- Establishment of mandatory compliance or promotion of voluntary schemes, as appropriate (and related certification schemes), such as a new animal identification and traceability system, hazard analysis and critical control points (HACCP), good health practices (GHP) and good management practices (GMP) for all sector players in the value chain to create incentives ***for self-regulation and cross-technical assistance within the value chain*** (e.g., from slaughterhouses to farmers);
- ***Accreditation of a national competent authority to certify*** national companies vis-à-vis international norms (ISO9000, ISO14000, ISO2200, GMP,[15] GHP[16]). Private service providers should be encouraged to provide advisory and certification services to build compliance capacity within the businesses;
- Regulation and enforcement on food safety-related certification on animal source food commercialized in formal outlets (shops, butchers, supermarkets, etc.) to create incentives for self-regulation and technical assistance within the value chain (from the supermarket to food processors).
- ***Simplification of the chain of command under which veterinary officers operate*** (central MAF directorate general -> governorate's director-general -> *wilayat* manager -> veterinary officer) and development of clear operational guidelines in order to make veterinary officers more responsive to demand.
- ***Establishment of a biosecurity and food safety assurance function under one umbrella***: have only one committee on food safety with a decision-making role on food and feed testing, including monitoring, detecting and controlling zoonotic agents along the supply chain. Establishment of ***a single veterinary inspection and business monitoring system*** based on the need for animal identification (and health records) and food safety regulations certification.

[15] Good Manufacturing Practices.
[16] Good Hygiene Practices.

Main partners in the proposed interventions in Outcome 2

Intermediate outcome	Intervention	Main partners
IO 2.1	Development of a master plan for land use on Salalah	MRMWR, Ministry of Housing (MOHO), MECA, local authorities, CSOs
IO 2.1	Formulation, agreement and enforcement of pasture use management plans	CSOs
IO 2.1	Establishment of pasture remote sensing assessment	MECA
IO 2.1	Control of feed quality	MRMWR, private sector
IO 2.1	Research on alternative sources of feed, animal breeding and product development	Private companies (PPPs), CSOs
IO 2.1	Establishment of mechanisms and initiatives to secure feed import	MOCI, MOF, private sector
IO 2.1	Widening of the product mix of milk processing units	OFIC, Riyada
IO 2.1	Provision of technical services from processing units to their suppliers	OFIC, MRMWR, Riyada
IO 2.1	New product development, branding, labelling	RCA, Riyada
IO 2.1	Farmer training of trainers activities, and transfer of improved feeding technologies	RCA
IO 2.1	Reform of the legal framework on producer organizations	MSD
IO 2.1	Consumer and producer awareness campaigns	MRMW, MOCI, MOH
IO 2.1 and 2.2	Establishment of slaughterhouses in strategic locations, equipped with adequate staff for the production of a wide range of high-quality products	MRMWR, MOHO, Riyada, private sector
IO 2.2	Speeding up and improvement of business licensing procedures	MRMWR, MOHO
IO 2.2	Revision of feed price compensation mechanisms	MOF
IO 2.3	Installation of honey extraction and processing facilities in key locations	MOHO, MRMWR
IO 2.4	Development of a full-fledged veterinary course	SQU
IO 2.4	Slaughtering of sick animals to control diseases	MRMWR
IO 2.4	Equipment and staffing of laboratories and coordination of biosecurity and food safety activities	MRMWR, MOCI
IO 2.4	Improvement of biosecurity and food safety regulations and law enforcement, and creation of certification bodies	MRMWR, MOCI, private sector

4.3.3 Outcome 3 – Sustainable management of natural resources in agriculture enhanced

The achievement of Outcome 3 depends on the development of four IOs. An analysis of the projects programmed under the 9th FYP resulted in 11 projects contributing to Outcome 3, for a total budget of OMR 45.5 million (see details in Annex II – Outcome 3).

The SARDS 2040 aims to progressively move towards the sustainable use of national water resources – a zero water balance – and increase water productivity in agriculture and livestock production. Increasing water productivity is addressed through the production improvements necessary for the achievements of Outcomes 1 and 2. This section will deal mostly with the necessary interventions to progressively move towards a more sustainable use of water through the monitoring of its use, the creation and strengthening of water users' groups and negotiation of individual water rights within each group. On land use and degradation, this section identifies the need for updated land mapping in order to enhance decision-making on land use, prevent land degradation, promote the efficient use of land and provide the tools for the adequate management of groundwater by extracting it where it can be more productive. It also foresees assessing alternative water sources and the study of possible improvements in agricultural labour and land management.

All proposed interventions are aligned with the *Strategy to Achieve a sustainable water sector in the GCC* (2014)[17], the *Oman Salinity Strategy* (2012)[18] and the *National Water Resources Master Plan* (2000). As most private sector activities that could contribute to achieving this outcome were described in the previous two outcomes, specifically under Outcome 1, this section focuses on the

[17] Achieving a sustainable water sector in the GCC: Managing supply and demand, building institutions, Dubai, Strategy&, 2014 (available at http://www.strategyand.pwc.com/media/file/Achieving-a-sustainable-water-sector-in-the-GCC.pdf).
[18] Oman Salinity Strategy, Ministry of Agriculture and Fisheries & International Center for Biosaline Agriculture (2012).

public interventions that can provide improved incentives for the better preservation of Omani natural resources in the next five years.

Priority setting for investment needs to focus on moving towards a sustainable water balance in the country's aquifers and regions where: (i) most of the agricultural production is concentrated and there is a clear trend of groundwater depletion and seawater intrusion; (ii) farmers are currently the most organized and therefore efforts to strengthen water users' groups would be easier; and (iii) opportunities for product value addition are greater. Hence, the Al Suwayq zone of Al Batinah could be the first possible intervention area, along with some *aflaj,* where changes in production, irrigation techniques and farmer organizations indicate potential to improve local livelihoods and contribute to improved water management.

IO 3.1 – Income per unit of water used in agriculture maximized

The achievement of IO 3.1 requires the implementation of a water management framework that allows for the sustainable use of national water resources and an increase in the productivity of the water being used in agriculture.

Public interventions: Achieving this IO is mostly conditioned by: (i) an effective inter-ministerial coordination; (ii) sound land and water use planning; (iii) water metering; and (iv) establishment of quotas on water consumption for agriculture. The 9th FYP has programmed the introduction of modern irrigation equipment on 3,000 farms; research on sustainable irrigation water management; and, under Outcome 1, interventions for selecting crops that return the highest income, and for optimizing production and post-harvest practices.

Recommendations:

- ➔ *The approach to investment*
  - On land and water use planning:
    - Focus research endeavours on a ***comprehensive land mapping, starting from Al Batinah***. Knowledge on current land suitability (soil salinity/seawater intrusion, water availability and quality, soil characteristics, slope, etc.) is a key input for well-informed policy dialogue on land use and effective land use planning. Collaboration with the MECA and the MRMWR will enrich the mapping exercise with information on vulnerability to floods, seawater intrusion, wind erosion, etc. The ***latest computer-based mapping technologies should be used***. Whenever possible, this exercise should be combined, or find synergies, with similar initiatives, such as rangeland land use planning (see IO 2.1).

  - On water metering and establishment of quotas:
    - Establish a ***pilot in one whole aquifer in Al Batinah,*** following the methodology piloted by SQU. This should aim to reach around 8,000 wells and 9,000 *feddans* where the majority of farmers should belong to the Al-Batinah farmers association. The pilot should follow some key recommendations, including:
      - In the first year the pilot would foresee the ***installation of meters*** in all the wells, facilitation work with farmers on this initiative and ***collection of hydrogeological data*** (installation of piezometers). Farmers could be subsidized by the project in introducing modern irrigation equipment that would give priority to this aquifer.
      - After one year of metering and data collection, work on ***setting individual quotas*** would be undertaken (individual quotas based on historical production have proven to be more acceptable than equal quotas).[19]
      - Subsidies for modern irrigation should give priority to establishing a pilot intervention and if possible ***provide incentives for the adoption of more efficient farming systems*** (e.g., subsidies provided for equipment under the conditionality of metering and the adoption of high-value crops suitable to the region).
    - ***Seek synergies and establish linkages with Outcome 1 by selecting common target groups for interventions.*** Interventions contributing to

[19] Based on the SQU experience in a pilot run in Al Suwayq zone of Al Batinah, farmers in general did not accept equal quotas when they previously had different water use levels for different areas and crops.

Outcome 1, in addition to targeting farmers clustered around value-addition facilities, with the potential to be integrated into modern value chains (growing high-value crops, adopting GAP, reducing post-harvest losses and integrating into an efficient marketing chain), should also give priority to regions where water metering is being introduced. Model farms should be established where demonstrations on the efficient use of water for the major agricultural systems in the selected aquifer would be undertaken.

➔ *Relevant topics for policy dialogue and institutional coordination*:

- Enforcement of ***decision-making capacities of a centralized, supra-ministerial body on water management*** (consulting with fora, including civil society, on regional water issues – e.g., the Omani Water Society, Al Batinah farmers association) as recommended in all water-related strategies;
- ***Design of an implementation strategy for the metering and water quota pilot in Al Batinah,*** defining the roles of each institution – knowing that metering and applying quotas is within the mandate of the MRMWR, but that the MAF would have the key role in organizing and informing farmers, providing incentives and introducing efficient farming technologies;
- Based on a comprehensive land mapping, ***rezoning of land for agricultural, commercial, housing or tourism development***, starting from Al Batinah and the Dhofar plains. This topic responds to what is planned in the *Strategy to Achieve a sustainable water sector in the GCC (2014)*, the *Oman Salinity Strategy* (2012) and the *National Water Resources Master Plan (2000-2020)* and would entail: (i) shifting high saline areas from production to other uses; (ii) shifting some agriculture to new areas with better soils, where the groundwater is of good quality and where greater productivity and income can be obtained from the same amount of water used; and (iii) introducing permits for crop selection based on soil and water suitability. This would enable the most efficient (cost-effective and productive) use of land and water in the long term.

The importance of land use planning in facilitating the development of productive enterprises that use natural resources sustainably

Adequate planning coupled with rezoning prevented the construction of new wells in the saline areas of Al Batinah. Evidence shows that the most effective payoff for farmers in saline water coastal areas would be in rezoning their land for commercial, housing or tourist facility development. The *Oman Salinity Strategy* also demonstrated that it is more economically efficient to use fresh water to increase productivity than to struggle to rejuvenate saline-affected farms. Biosaline agriculture may be economically viable as a short- to medium-term coping strategy in good quality groundwater areas, permitting the rejuvenation of soils that have become salinized through poor management, but not for producing on farms with no alternatives other than salinized water. According to the *Oman Salinity Strategy* (2012), land use planning has been successfully applied not only to areas served by wells, but also to *falaj* systems, potable water supply sources and areas that have witnessed environmental damage.

- ***Changes in the incentive structure*** to induce the adoption of more sustainable water productive practices and crops (see IO 6.2); and
- Any plan for the ***establishment of new farms***, which should be aligned with the SARDS 2040 and previous strategies, that is, those that: (i) foresee the allocation of a water right which would be monitored; (ii) are equipped with efficient irrigation equipment (e.g., automated water demand soil sensors and water supply monitors); and (iii) have a commercial approach to the selection of crops and farming systems. Given these necessary conditions to ensure water use sustainability, ***the Oman Salinity Strategy sees long-term conditional leases as more enabling of water use law enforcement than the attribution of land ownership***.

IO 3.2 – Capture, reuse and storage capacity of water for agriculture increased

Public interventions: There are in-country experiences and studies on some technologies for the use of alternative sources of water. However, there is no comprehensive feasibility study that assesses their applicability to specific agricultural systems in the country or the policy options to provide incentives for their widespread adoption. The 9th FYP contains projects by the DGAD and DGALR that aim to test and increase the use of treated water and desalinized water in agriculture.

Recommendations:

- ➔ *The approach to investment*:
  - Gather existing knowledge on water capture, reuse and storage capacity of water for agriculture. Before engaging in on-field experiments, research could focus on a ***comparative study with policy options for a series of available technologies*** (e.g., treated wastewater, fog collection, desalination, recharge dams, use of oil-associated water). The study should at least provide a description of the characteristics of the technology as it is available in the country and a comparison with international best practices; the maturity of its application and the in-country capacity to implement and manage it; its potential for water provision for agriculture (as a maximum) in the country; how much it has been adopted vis-à-vis its potential; possible market failures; financial and economic benefits (to the private adopters and to the country as a whole); and its cost per m3 of water obtained. Such a study would allow a better understanding of the potential of each technology per region and of the policy and research interventions that might be needed to widen its adoption. Cooperation with the MRMWR and private farms already testing technologies (e.g., *One Million Date Palms* project) is paramount;
  - Train key staff at the MAF in methodologies for a comprehensive assessment of technologies, so that this work can be sustainably undertaken by the Ministry for new research products;
  - Both the *Strategy to Achieve a Sustainable Water Sector in the GCC* (2014) and the *Oman Salinity Strategy* (2012) point to desalinization as not feasible economically and as having environmental costs that are too high to be used in agriculture. Hence, in the short term***, research should focus on developing economically efficient desalination technologies powered by renewable*** **energy sources**, rather than in the introduction of existing technology on farms. Introduction of desalination technology would start on high-tech model farms producing high-value crops with skilled labour. Cooperation with GCC research institutions outside the agriculture field is essential.

- ➔ *Relevant topics for policy dialogue and institutional coordination*:
  - In the presence of subsidized fuel or electricity, the absence of water metering and fees and price competition from other sectors, there is little incentive for the adoption of alternative and more costly sources of water in agriculture. Informed by studies on the feasibility and potential of different water technologies, and in consultation with civil society and the private sector, a supra-ministerial body on water management would **discuss and design policies that would provide incentives for the adoption of adequate and economically efficient alternative water sources** and the attribution of priorities for water use.

IO 3.3 – Soil management improved

Public interventions: There are three projects in the pipeline (OMR 5.5 million) all related to the management of saline soils. The SARDS 2040 and previous related strategies are cautious with regard to large investments in salinity adaptation technologies, advocating instead for sound land use planning and management in which salinity is one of many issues to be addressed (e.g., water contamination, erosion, opportunities for efficient land use change, etc.).

Recommendations:

- ➔ *The approach to investment*:
  - Give priority to ***soil and water mapping*** (with elements on soil degradation, including erosion, nutrient and organic matter loss, etc.) described in IO 3.1.
  - ***Promote soil protection, soil fertility management and reduction of pollution*** from agriculture, included in the GAP under Outcome 1, and livestock residues management under Outcome 2.
  - Invest in protective barriers in highly vulnerable areas (floods, seawater intrusion, wind) identified in the land mapping, in coordination with other ministries – the MRMWR and the MECA.
  - ***Invest in saline-tolerant crops***, considering that according to the feasibility studies conducted for the *Oman Salinity Strategy* and the SARDS 2040, the use of such crops/varieties should be transitional, with priority given to land use change of saline soils and the production of high-value crops where the conditions for their

production exist. Investment in the installation of on-farm ***desalination units*** should also be cautiously assessed (see IO 3.2).
    - ***Integrate model farms on salinity management*** as much as possible with those from IO 1.1.
    - The achievement of this IO's results will mostly be made through initiatives under other IOs. The ***budget could be reallocated to serve those activities with high priority***.

➔ *Relevant topics for policy dialogue and institutional coordination*:
    - Improvement of land use strategies as suggested in IOs 3.1 and 6.1 (land rezoning).

IO 3.4 – Agrobiodiversity conserved

Public interventions: Biodiversity conservation is in many aspects under the responsibility of the MECA, and therefore the SARDS 2040 only touched on what could be more directly dealt with in the MAF.

Recommendations:

➔ *The approach to investment*:
    - Have MAF focus, for the next five years, on an ***inventory and information system on genetics, breeds, varieties and species, the setting up of a gene bank and registration programmes for indigenous varieties and breeds***. Provisions for this are already earmarked under one of the projects planned in the 9th FYP.
    - ***Possibly finance education awareness on conservation measures in areas with agrotourism potential and promotion of in-situ conservation*** through other components (IO 1.1, IO 2.1 and IO 6.6). ***Ex-situ conservation*** should be programmed and financed by other competent institutions (e.g., MECA). The MAF could take biodiversity (and water conservation) concerns into consideration during the approval of licenses for green hotels with the MOT. Collaboration with the MECA and the MOT is paramount.

Main partners in the proposed interventions in Outcome 3

Intermediate outcome	Intervention	Main partners
IO3.1	Land suitability, erosion and natural disaster vulnerability and current use mapping	MECA, MRMWR, MOHO, SQU
IO3.1	Improved land use planning	MRMWR, MOHO, MECA, SQU, CSOs
IO3.1	Irrigation water metering and quota	SQU, MRMWR, CSOs
IO3.2	Study on water capture, reuse and storage	MRMWR, MECA, SQU
IO3.4	Inventory and information system on genetics, gene bank	SQU, MECA
IO3.4	Awareness and in-situ and ex-situ conservation	MHE, MECA, MOT

4.3.4 Outcome 4 – Resilience of agriculture and rural livelihoods to climate change and natural disasters improved

Outcome 4 requires the achievement of two IOs for which there is currently no investment programmed by the MAF.

The required actions to achieve this outcome are related to planning, improvement of institutional frameworks for coordination and collaboration and knowledge development on climate change adaptation, mitigation and disaster risk reduction and management (DRRM) and resilience. Most of them fall under the mandate of the MECA, the MRMWR or other institutions. In this domain, the key role of the MAF is twofold, namely through:

- policy dialogue to ensure that the role of agriculture and rural development is mainstreamed into national strategies and action plans; and
- field and research operations to ensure that climate change, disaster risk management and resilience are *in turn* mainstreamed into its extension services and the dissemination of technologies and techniques for agricultural production, processing and marketing (i.e., throughout the SARDS 2040).

IO 4.1 – Climate change adaptation and natural disaster risk management integrated into agricultural and rural policy, investment and programmmes and **IO 4.2 – Climate change mitigation and agricultural carbon footprint improved**

The overall objective of IO 4.1 is to enhance the agriculture and rural sector's capacities to adapt to harsher weather patterns and increased natural disasters. This includes, in the long run, proofing productive infrastructure against cyclone and flood risks, planning infrastructure and land use to take into account climate-related risks and planning for agriculture in the face of climate risks. In the shorter run, the interventions are mostly focused on enhancing the knowledge of the MAF and raising awareness of all stakeholders to form a class of actors and investors better prepared to face climate change.

Similarly, the overall objective of IO 4.2 is to enhance the capacities of the agriculture and rural sector to contribute to climate change mitigation. This entails interventions at agricultural production levels, promoting higher energy efficiency, encouraging the adoption of renewable energy resources, but avoiding that the increased availability of energy sources (e.g., for water pumping) threatens the entire sector's sustainability. The operationalization of this will go through the programmes promoting innovation (IO 6.5) and Outcomes 1, 2 and 3, and would permit having rural enterprises as entry points for a more efficient energy use. In addition to this, the SARDS 2040 also presents an opportunity for more responsible consumer behaviour through awareness campaigns foreseen under IO 6.6 that promote food consumption patterns more sensitive to the carbon footprint.

Recommendations:

- ➔ *The approach to investment:*
  Key areas of intervention of the MAF comprise the following:
  - ***Establish a focal point function on climate change adaptation and mitigation***: a unit of the MAF will be responsible for carrying out policy dialogue and ensuring the mainstreaming of climate change adaptation and mitigation in agriculture, livestock, fisheries and research operations. Capacity development of the MAF's staff may be required to ensure effective participation in the inter-institutional dialogue. Functions of the focal point would include
  - ***Contribute to high-quality and relevant strategic planning on climate change adaptation, mitigation and disaster risk preparedness*** (see policy dialogue section below).
  - ***Identify climate change-related risks and practicable solutions (study)***: a specific study should be carried out to identify risks of and practical solutions to climate change for agriculture and rural development, including infrastructure and basin planning; the study will serve as an input for the MAF's participation in preparing a strategy on climate change and disaster preparedness.
  - ***Identify appropriate infrastructure design models for agriculture and rural development (study)*** in the coastal region and in the flood plains; this should be an additional activity, with responsibilities shared between the MECA and the MRMWR.
  - ***Promote higher energy efficiency and the adoption of renewable energy resources*** through field operations and subsidies within the scope of Outcomes 1, 2 and 3.
  - ***Mainstream climate change adaptation and mitigation throughout the programmed awareness campaigns*** (cross reference with IO 6.6), designed under the coordination of the MECA, and with the MAF contributing through its expertise on issues specifically related to agriculture.

- ➔ *Relevant topics for policy dialogue and institutional coordination*:
  - *Identification of the needs for climate change adaptation, disaster preparedness and resilience in agriculture and opportunities for climate change mitigation in the agrofood sector*. Although these topics fall only partially under the mandate of the MAF, the MAF's role will be to ensure fruitful collaboration and to proactively stimulate dialogue with other institutions (MECA and MRMWR, in particular) – reference to IO 6.1.

Main partners in the proposed interventions in Outcome 4

Intermediate outcome	Intervention	Main partners
IO 4.1	Contribution to strategic planning on climate change adaptation and DRRM	Mostly MECA, but also MRMWR
IO 4.1	Study on infrastructure design for adaptation to climate change	MECA
IO 4.2	Contribution to high-quality and relevant strategic planning on climate change mitigation	MECA
IO 4.2	Awareness campaigns on climate change adaptation	MECA
IO 4.2	Promotion of renewable energy sources	MECA and MRMWR

4.3.5 Outcome 5 – Rural communities empowered and rural livelihood opportunities improved

As defined in the SARDS 2040, improved opportunities for livelihoods in rural areas do not depend solely on the development of the agriculture and rural sector or the intervention of the MAF. They entail identifying location-specific opportunities for interventions that depend on the characteristics of each local socio-economic and environmental system. Two main general opportunities for improving rural livelihoods were included as SARDS IOs, as they were considered to represent those in which the MAF and its direct partners could have a more active role: (i) the increase in number, size and diversity of rural economic activities to provide opportunities for a diversified population (in age, gender, interests, occupation) to settle in rural areas; and (ii) the preservation of unique local cultural heritage and traditional social values. The latter, in turn, generates intangible goods for local livelihoods, such as an identity and a sense of belonging, economic opportunities for tourism or local denominated products, etc.

During the stakeholder consultations for the design of the SARDS 2040 and the IP, the area of Jebel Akhdar was indicated as the most appropriate for designing and piloting a rural development programme that would contribute to IO 5.1 of the SARDS 2040, i.e., *increase and diversify economic activities in rural areas,* building on local specific cultural and environmental heritage. The main reason was its potential to generate quick benefits and implementation lessons that could be used for similar rural development programmes in other parts of the country. IO 5.2, dedicated to the preservation of Omani cultural identity, is to focus on preserving the most relevant set of rural heritage sites, the *aflaj*, over the next five years.

Within the 9th FYP, the MAF has planned seven projects relevant to Outcome 5. Four of these projects focus on enhanced management of natural resources in remote or disadvantaged rural areas (three relatively small projects on the efficiency of irrigation, family farming and pest control for fruit trees in mountain areas, for around OMR 1.0 million each, and a larger anti-erosion soil rehabilitation project for OMR 12.0 million). However, only one project is specifically dedicated to establishing and developing SME projects in agriculture (OMR 1.0 million). The two remaining projects are specific to the development of *aflaj* farming systems.

IO 5.1 – Rural economic activities diversified and livelihood opportunities improved

The development of economic activities in rural areas, even in a delimited pilot area such as Jebel Akhdar, will require an important inter-institutional effort. Hence, the achievement of this IO will be conditioned by the ability, for example, to: (i) ensure effective coordination among all stakeholders and institutions/agencies in important endeavours such as identifying opportunities, local planning, promoting the region or providing support services to key economic sectors; (ii) develop effective collaboration between the public and private sector in key sectors such as tourism (e.g., hotels in national heritage sites) or local industries (e.g., special conditions for installation, free technical support services, etc.); and (iii) attract the engagement and collaboration of the younger diaspora to invest, contribute to and promote the region and eventually move back. This effort goes beyond the MAF's mandate and should be coordinated by a higher-level institution and the MRMWR, MOT, MHC, MOH and MHE for investing in local development strategies, study tours, local institutions capacity development, etc.

Recommendations:

➔ *The approach to investment (as preparation for the future upscaling of rural development programme):*

- **Carry out a preparatory study on the 'identities of Omani rural areas'**: Considering agriculture as the entry point for the rural development programme, the MAF (or the AFDF) could finance a small study with a focus on the entire country, aimed at identifying:
  - the identities and roles of rural contexts (and the most suitable definition of rural areas) and related institutional and infrastructural gaps; and
  - potential areas suitable for launching a rural development programme (besides Jebel Akhdar).

- ***Identify causes and risks associated with social marginalization (study)***: Despite poverty, marginalization and vulnerability in absolute terms may not be a significant issue in the country. A specific study on the determinants of relative social exclusion (including between rural and urban areas) would help identify relatively vulnerable groups as well as the causes and associated risks of non-interventions. This should be done in coordination with the MSD.

➔ *The approach to investments (for the pilot in Jebel Akhdar):*

- ***Carry out a specific participatory analysis of the selected areas for the rural development programme interventions (including the Jebel Akhdar context)***, involving, from the beginning, local communities to identify local institutions and roles within Jebel Akhdar, the needs of the territory, including existing institutional and infrastructural gaps and potential leaders who could initiate and advocate for a process of change. Coordinate with other existing initiatives such as a possible Globally Important Agricultural Heritage System (GIAHS) initiative.
- ***Launch the rural development programme in Jebel Akhdar (and possibly other areas),*** embracing the following aspects:
  - advocacy of the engagement (and possible forms of engagement) of local actors (farmers, hotel managers, shoppers, etc.) and diaspora (i.e. the 'sons and daughters of the village')[20];
  - facilitation of a public-private dialogue on the key investments needed to maintain the local economy dynamic (both on- and off-farm); and
  - development of local partnerships to design and execute projects to address specific local problems.

- Use projects planned in the 9th FYP, such as the *Establishment and development of SMEs* and the *Efficiency improvements in irrigation water and IPM in mountainous agricultural areas* to: (i) support production, differentiation and marketing of **location specific products** (e.g., rosewater, thyme, vinegar, etc.); (ii) improve economic diversification and **develop off-farm activities** (e.g., processing and bottling, tourism); and (iii) mainstream the promotion of **environmentally sustainable practices**, organic farming or even support for the provision of environmental public goods.

- ***Gear interventions towards production and valorisation of traditional products*****:** the MAF's foreseen investments in support of family agriculture would need to be geared towards the production and valorisation of traditional products through mechanisms such as the: (i) recognition of **geographic identification of locally produced goods** (PDO, PGI, TSG);[21] (ii) adoption of an **umbrella logo** (e.g., a Jebel Akhdar logo) for the branding of all locally produced goods and services and thus the institutional marketing of the area; and (iii) development of short value chains to retain larger shares of added value within the area and build trustful relationships between producers and consumers. Such activities should be supported by public projects of the MAF in coordination with other competent institutions (e.g., Riyada).

[20] Indicating the diaspora of the youth from the involved area, their involvement being aimed both at awareness raising and resource/investment mobilization

[21] PDO: *Protected Designation of* Origin; PGI: *Protected Geographical Indication*; and TSG: *Traditional Specialties Guaranteed*.

IO 5.2 – Local cultural heritage and traditional social values preserved and valued

Achieving this IO will require the promotion and conservation of specific assets, such as historical centres, cultural heritage sites (e.g., the terraces of Jebel Al-Akhdar), traditions or artisanal products, as well as the development of synergies, primarily with tourism. Whereas opportunities for preserving important local cultural heritage and traditional social values should be sought in general (e.g., the classification of the terraces of Jebel Al-Akhdar as a GIAHS and the necessary activities for their sustainability), this IO gives priority to the country's most abundant heritage sites, the *aflaj* systems, which are generally linked to the agriculture and rural sector. The sustainability of the aflaj entails not only the production system (often smallholdings geared towards household consumption), but also the conservation of historical heritage as well as traditional practices (e.g., large crop diversity, date plantations not adjusted to new market demands or the adoption of efficient technology) and institutions (water management). Projects under this IO should learn from the experience of the 2005 project for the *falaj* in Dhahira (Amla village).[22]

Recommendations:

- ➔ *The approach to investment (as preparation for future programme upscaling):*
  - ***Identify specific cultural heritage assets (study)***: the study should focus on historical centres, cultural heritage sites (including buildings, cities, landscapes, monuments, etc.), traditions and artisanal products to leverage upon in order to develop synergies among economic activities in each intervention area.
  - ***Identify potential initiatives for the valorisation of local cultural heritage and social values (design)***, with related actions including:
    - conservation of *aflaj* irrigation systems;
    - conservation of historic village centres;
    - promotion of cultural events and practices; and
    - mobilization of civil society in support of the heritage conservation programme, including national, regional and local non-governmental organizations (NGOs) and communities.

- ➔ *Approach to investments (specific investments on aflaj preservation and their role in the communities, based on the 2005 experience in Dhahira):*
  - Aimed at decreasing the use of water by promoting irrigation based on crop requirements, increase water use efficiency, minimize water losses, strengthen cooperation among farmers, reduce labour requirements for irrigation, decrease the occurrence of plant diseases and weeds, increase productivity, reclaim land and improve village income. Start in the *aflaj* with stronger communities, closer to marketing facilities and agents, and generally included in tourism routes.
  - ***Strengthen farmer groups***, the acceptance of non-flood irrigation systems (bubbler, sprinkler, drip irrigation) and improved cropping patterns and crop varieties, solving possible disputes in access to water and water rights.
  - Focus primarily on the main crop in each *falaj* in terms of irrigation, cropping patterns and improved varieties (usually date palms) and then ***agree on the farming and irrigation system for the remaining crops***.
  - ***Subsidize tree removal, replacement and irrigation systems.***
  - ***Install necessary infrastructure*** such as canals, storage and roads for easier mechanization and transport and increased conveyance efficiency, and for storing and using excess water.
  - ***Train and ensure strong commitment from extension staff***. Training of trainers activities could be conducted by extension officers with experience in Dhahira, as well as research officers with knowledge on the best adapted irrigation technologies and cropping systems. The Amla village could become a model for study tours for technicians and lead farmers.
  - Enrich the above experience from Amla ***by linking to activities under Outcome 1***, e.g., improving post-harvest facilities and practices and farmers' linkages to markets, introducing mechanisms for product differentiation such as the brand of *falaj* dates, creating employment opportunities in small-scale processing facilities for differentiated local production, including the *falaj* in tourism routes and licensing of green hotels.

[22] Al Mamary, S. and Al Kalabani, S. (2010). Irrigation water management under small land holding in the aflaj system (Oman): A new approach to overcome challenges of water scarcity. Royal Irrigation Department of Thailand. Available at: http://www.rid.go.th/thaicid/_6_activity/Technical-Session/SubTheme1/1.17-SA_Mamary-SA_Kalabani.pdf.

- Gradually ***establish a network of model aflaj***, increasing the incentive for private investment from farmers and decreasing the Government's contribution for the modernization of each *falaj* (in 2005, the project for the Amla *falaj* cost the MAF USD 597,325 to implement on 38 hectares).

Main partners in the proposed interventions in Outcome 5

Intermediate outcome	Intervention	Main partners
IO5.1	Study on the identities of rural areas	MSD, MHC, MOT
IO5.1	Study on marginalization and social inclusion in rural areas	MSD
IO5.1	Launching of the rural development programme in Jebel Akhdar	RCA, MOCI, Riyada, MHC, MOT, MRMWR, OCCI
IO5.2	Study to identify specific cultural heritage assets	MHC, MSD, MOT
IO5.2	Reinvigoration of the *aflaj*	MOT, Riyada, MRMWR, CSOs

4.3.6 Outcome 6 – Enabling institutional environment for agriculture and rural development strengthened

The achievement of Outcome 6 depends on the development of six IOs. An analysis of the projects programmed under the 9th FYP resulted in a matching of 15 projects contributing to Outcome 6, for an overall request of OMR 67.3 million. Implementation of all 15 projects is under the DGPD. The projects cover many of the focus areas of the outcome, but neglect others that need to be addressed on a priority basis. More specifically, funds within the 9th FYP will be allocated for:

- Information management and sharing: seven projects, for a total of about OMR 10.8 million, aim to enhance the MAF's capacity to provide its stakeholders with high-quality sectoral statistics based on a reliable information management and sharing system and address the issue of public awareness raising;

- Knowledge and studies: four projects (OMR 7.2 million) aim to carry out studies and consultancies to support the ministries in managing their development interventions. Among them, two stimulate public support to private investments: one specifically dedicated to enhancing the quality of the design of project proposals (OMR 0.5 million), and the other to supporting the preparation of private investment proposals,[23] mostly related to OFIC's interventions (OMR 3.0 million);

- Capacity development: one project (OMR 4.9 million) is dedicated to building the MAF's capacity in various technical, managerial and administrative fields; and

- Building and facilities maintenance: the three remaining projects (OMR 44.3 million) focus on refurbishing and renovating existing buildings, plus constructing new ones, to enhance the MAF's capacities to provide agricultural and fisheries services and establish new veterinary clinics in the governorates.

The interventions under Outcome 6 are instrumental to the success of the entire strategy, and aim to improve the economic environment and its ability to stimulate private investments. In order to achieve the outcome, the priority actions include inter-institutional coordination and reform and enforcement of the regulatory framework, including: (i) enforcement of the Water Law through a programme in an aquifer in Al Batinah; (ii) enabling of collective entrepreneurial activities through the expansion of the scope of the Law on Associations; (iii) improved land planning in order to better guide private investors on opportunities for land use; and (iv) relaxation of the limitation of expatriate employment in agriculture. Other priority actions aim to: (i) reform the subsidies system by providing *smarter* incentives that contribute more effectively to the development of each subsector, and link extension services to the reformed subsidies scheme; (ii) assure price differentiation possibilities for the same product based on quality, origin, etc.; (iii) enhance the reliability of sectoral statistics and the related decision-making processes; and (iv) expand the provision and outreach of financial services and pilot a system of agricultural insurance.

[23] Submitted to MAF for technical clearance before the request for land attribution.

All of the above-mentioned actions must be accompanied by effective and professional awareness-raising initiatives in order to enhance public support at various levels. Most of the required investments have limited financial implications, except for the mobilization of technical expertise (e.g., on policy and regulatory framework advice, professional-level communication), as most of the interventions are related to policy dialogue and institutional coordination. The success of the outcome will depend, on the one hand, on high-level political engagement and a systematic and proactive effort by the MAF in convening evidence-based discussions with other institutions and private stakeholders and, on the other, on the MAF's high performing, results-oriented operations and communication capacities.

IO 6.1 – Institutional and regulatory framework enhanced and enforced, and IO 6.2 – economic environment enhanced

In the IP, IOs 6.1 and 6.2 are kept together as their operational structure and interventions are similar. Yet they are substantially different in terms of their focus and aim, which will be reflected in the scope of the (similar) interventions proposed. More specifically, IO 6.1 has a wider scope and is mostly geared towards establishing a systematic dialogue among the sector's stakeholders, while IO 6.2 has a more specific focus, aimed at enhancing the effectiveness of agricultural value chains, including through the establishment of a *smarter* system of subsidies. Overall, the interventions required to ensure the success of the two IOs comprise mostly studies, policy dialogue and specific, high-level consultancies.

Public interventions: The three projects relevant to these two IOs are functional to the scope of the SARDS 2040, but require a substantial revision.

Private sector participation: The private sector, in organized forms (commercial associations of entrepreneurs, cooperatives) or as individual entrepreneurs, must be called to take an active part in the policy dialogue established by the MAF. Initiatives such as sponsorships to facilitate dialogue and ensure sufficient inclusion would be appreciated.

Recommendations:

- ➔ *The approach to investment:*
  IO 6.1: the first intervention under this IO is to establish mechanisms to facilitate policy dialogue. The dialogue will focus on topics highly relevant to the implementation of the SARDS 2040. As such, this IO responds to the need to unlock organizational or regulatory bottlenecks for the sector's development as identified in the previous IOs. The dynamics generated by the dialogue should enable a stronger, faster and more sustainable growth of the enterprises and all economic actors operating in the agrofood sector. The expected product of this dialogue is the review, reform and enforcement of specific laws and regulations on land and water use, labour, CSOs, biosecurity and food safety.

  - ***Carry out ad hoc studies to inform policy dialogue*** – these will include topics such as:
    (i) the economic returns to water of particular varieties in key locations (IO 3.1);
    (ii) labour requirements in key subsectors (IO 3.3);
    (iii) access to land, incentives to land consolidation and opportunities for land management reform (IO 3.3);
    (iv) land use, degradation and vulnerability maps (IOs 1.1, 1.2, 2.1, 2.2, 3.3) or basin management plans (IO 4.1);
    (v) different types and roles of producer organizations and CSOs, their relevance and possible roles within each Omani subsector. The study would help bring about reform of the legal framework in order to provide the country with the legal space to create cooperative enterprises, inter-professional organizations or privately financed group entities for financing, advocacy, etc. of a subsector (with potential benefits for all outcomes of the SARDS 2040);
    (vi) the national investment gap and investment potential offered by the agriculture and rural sector, namely foreign direct investment (FDI); and
    (vii) any others deemed necessary.
  - ***Establish ad hoc, inclusive working groups,*** composed of members from ministries and other institutions, on the main legal and regulatory frameworks that require reform (as identified in the previous outcomes).

- ***Engage in a participatory policy dialogue*** involving all relevant stakeholders, including national and decentralized institutions as well as existing associations and private sector individuals and enterprises.
- ***Consider the possibility of establishing a specific overall coordination body*** or mechanism for the purpose.

IO 6.2: The implementation of this IO is closely related to IO 6.1, and envisages similar dynamics. The specific focus is on enabling a stronger, faster and more sustainable growth of the enterprises and economic actors operating in the agrofood sector.

- ***Establish a smart subsidies system*** (see example in the box below) by mobilizing international technical expertise for studies, seminars and workshops in order to adapt the current Omani subsidies policies for the establishment of effective, more integrated and more efficient incentive packages.
- ***Define a common strategy for technical and financial assistance*** by institutions such as Riyada, Oman Development Bank (ODB), Al Raffd Fund and the MOT for different types of enterprises and value chains (fruits and vegetables, small- and medium-scale livestock enterprises, etc.).
- ***Clarify the mechanism by which domestic prices are set***, and provide guarantees to entrepreneurs on the possibility to establish prices and the feasibility of price differentiation (e.g., higher prices for packaged vegetables or fruit of a certain grade).
- The project on the socio-economic assessment of agricultural, livestock and aquaculture programmed in the 9th FYP will need to ***include the establishment of technical councils*** that could undertake the rapid and accurate appraisal of the private sector's requests for project licensing (see IO 2.2, which describes the functions of such councils).

Examples of *smart* incentives

One example of subsidies tied to the achievement of a set of targets are the agri-environmental programmes implemented under the European Agricultural Guidance and Guarantee Fund (EAGGF) operational in the European Union until 2007[24] (then substituted by the European Agricultural Guarantee Fund [EAGF], and the European Agricultural Fund for Rural Development [EAFRD]). Some of the characteristics[25] of these programmes included the following:

1. ***They targeted specific regions and specific beneficiaries where the need for change was greatest*** – e.g., only land that could provide the most environmental, social or economic benefits was eligible for subsidies, ensuring that funds would be applied where they were most efficient or necessary.
2. ***They adopted a cost targeting approach*** – i.e., previous to the formulation of the subsidies programmes, studies were undertaken to ensure that the costs of compliance for the farmer would be less than or equal to the subsidy received (as a virtuous incentive).
3. ***GAPs clustered in sub-programmes*** – GAPs were not promoted as a generic package, but divided into different measures/sub-programmes, e.g., IPM (with different rules for different fruits and vegetables), organic (with specific rules for different fruits, vegetables, honey or animal products), soil conservation practices (depending on soil, geography, climate, and crops) or traditional system conservation (e.g., for Oman, these could be dates in *aflaj*, citrus orchards, local goat breeding). This segmentation of sub-programmes allowed different criteria for subsidy eligibility for each of them, i.e., different geographical targeting, different farm sizes, different soil characteristics, etc.
4. All of the sub-programmes had to include environmental conservation and human health considerations, as well as the adoption of certain technologies, such as proper agrochemical storage and use, plastics management in horticulture or waste management in livestock.
5. All of the sub-programmes were:
    - Policy relevant – addressing a key issue for the development of the sector and not subsidizing other items that were less relevant.
    - Analytically sound – based on sound science, such as studies on the adequacy of the technologies to the environment and the economic conditions for which they were promoted, and adapted in time through an iterative process of evaluation, learning and adjustment.

[24] The EAGGF was substituted in 2007 by the EAGF and the EAFRD, which finance the rural development programmes of the Member States of the European Union. They were set up on 1 January 2007, following Council Regulation No 1290/2005 of 21 June 2005 on the financing of the Common Agricultural Policy.

[25] Adapted from Warren, J. Lawson, C. and Belcher, K. (2008). *The Agri-environment*. Cambridge University Press, Cambridge.

- Monitored and enforced through indicators on adoption (e.g., of certain farm management practices, or the correct use of farm inputs). Such indicators would be proxies for the intended objective, in that case, a more productive and environmentally friendly agriculture.

6. Part of the subsidy was to be spent on technical assistance, in this way privatizing part of the provision of extension services (e.g., through a contribution to a farmer association that could hire technicians to assist its members in complying with the subsidy programmes' conditions).
7. The Government was to co-fund (technicians would pay the remaining fees) courses for technicians who would then be certified to assist farmers in complying with the subsidy programmes' conditions.
8. To be eligible for subsidies, farmers needed to take part in a course on the main practices of the subsidy they were applying for.
9. The Government had to keep a record of all of the farmers who subscribed to each programme and hire an independent agent to run random checks on a sample of farmers. Non-compliance would entail the loss of the subsidy and a penalty.
10. The success of such programmes required strong awareness campaigns. For example, in a country with a population below 10 million inhabitants, 90,000 brochures, 2,000 posters and 6 TV commercial advertisements were produced in one year alone.

Another example of what could be called *smart* incentives are indirect negative incentives, such as regulations for supermarkets that require them to sell only certified products (e.g., GAP). Although this 'incentive' is easier and cheaper to implement than the others described above, it requires a thorough analysis of the national value chains; if the incentive is not well designed, it may have antagonistic effects (e.g., all national farmers might then sell low quality products to informal markets, and supermarkets may be forced to import all of their products).

➔ *Relevant topics for policy dialogue*:

- The specific areas for policy dialogue around which working groups will be formed include:
  - (i) *The establishment of a conducive legal framework for cooperatives,* inter-professional organizations, farmers, water users or other types of CSOs; and enabling of collective entrepreneurial activities (Law on Associations, MSD, RD 14/2000), all of which are related to the entire implementation of the SARDS 2040, especially Outcomes 1, 2 and 3;
  - (ii) *The design and implementation of a strategy for the metering and establishment of a water quota system in a pilot region of Al Batinah* (by enforcing the already existing Water Wealth Protection Law, RD 29/2000 and related ministerial decisions), related to the implementation of Outcome 3;
  - (iii) *The adjustment of labour regulations with regards to the quota on foreign workers* (MOM, RD 35/2003) considering: (i) that many promising agricultural activities are labour intensive (with the exception of activities with a higher automation potential, such as poultry production or dairy processing); (ii) the relatively lower labour productivity of the sector and higher attractiveness of agricultural work for expatriate workers; and (iii) the need to enhance the attractiveness (profitability) of the agriculture and rural sector for Omani entrepreneurs;
  - (iv) *Possibilities of land rezoning for agricultural, commercial, housing or tourism activities,* including a dialogue on improved access to land (concessions, leases, etc.) and land consolidation in collaboration with the MRMWR, the MOHO and the MECA. This dialogue would contribute to setting widely accepted and known criteria for territorial planning per type of investment and to improving the speed of the approval process required for agricultural enterprises to begin activities. It should also contribute to planning on environmental conservation and disaster risk management*;*
  - (v) *Integration of the MAF (*agricultural and livestock enterprises) *in a "one-stop shop" for private investments system* - the planned MAF's project on e-government needs to contribute to the integration of agricultural and livestock enterprises in the *InvestEasy*[26] portal (coordinated by the MOCI)*.* This contribution requires the facilitation and establishment of clearer criteria on land and water access and the establishment of a mechanism for joint decision-making on project approval;
  - (vi) *Creation of a single umbrella for food safety and biosecurity management* and adequate, single management lines for veterinarian officers;

[26] https://www.business.gov.om/wps/portal/.

(vii) *Improvement and control of feed quality standards;*
(viii) *Strengthening of biosecurity and food safety standards legislation,* including enforcement mechanisms (MAF, MOCI, MRMWR);
(ix) *Adaptation of the* RAI[27] and related *Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests* (VGGT)[28] to the Omani context, which would provide a consistent and responsible framework to regulate investments, including those abroad;
(x) *Reform of incentives/subsidies for agriculture* to foster the adoption of adequate and economically efficient alternative water sources, the attribution of priorities for water use and the adoption of GAPs, GHPs, GMPs, HACCPs, ISO9000, ISO14000, ISO2200, etc.; and
(xi) *Contribution to mainstreaming the role of agriculture and rural development into national strategies on climate change mitigation as well as contributing to strategies on climate change adaptation, disaster preparedness and resilience*. Even though these topics do not specifically fall under the mandate of the MAF, the role of the Ministry will be to ensure harmonious collaboration and to proactively stimulate fruitful dialogue with other institutions (the MECA and the MRMWR, in particular) – reference to IOs 4.1 and 4.2.

IO 6.3 – Provision of inclusive financial services improved

No investment is foreseen in the 9th FYP to contribute to achieving this IO. Therefore, specific actions will have to be designed and implemented. More specifically, the MAF will need to invest in convening the stakeholders to provide incentives for improving financial services for the agriculture and rural sector, as financial services typically call for private sector leadership and entrepreneurship. The role of the public sector is to provide the initial institutional and knowledge support to highlight the presence of market opportunities and reduce the risk and costs of entry. The MAF will collaborate with other institutions (the MOF, the Central Bank of Oman [CBO], ODB, private banks and insurance companies) and invest in a study on appropriate financial services for agriculture in Oman, in dialogue with financial institutions (to stimulate the strengthening of the capacities of their staffs). It will consider establishing a collateral fund with the MOF for pilot activities. The role of the private financial sector, with subsidies from public institutions (or concessional loans from the CBO), is to expand and tailor the typology of its services and outreach. In addition, the MAF will collaborate with Riyada to establish agricultural investment promotion units.

Recommendations:

➔ *The approach to investment:*
- ***Initiate a process to facilitate access to financial services for agricultural investors***. This will include public investments to:
  (i) Carry out a study to analyse the appropriate financial products adapted to the agriculture and rural sector in Oman (see topics below for policy dialogue);
  (ii) Mobilize technical assistance to benefit financial institutions in order to enhance their capacities to identify market and credit opportunities and develop specific financial products for agriculture and rural development; and
  (iii) Provide capacity development to staff from the Government and financial institutions for analysing project proposals and financing options.
- ***Scout out and possibly pilot agricultural insurance schemes***, based on experience in countries with similar structural and/or environmental conditions. This will largely be done by building on the ongoing dialogue with the private sector, and by scoping potential applications of modern, traditional and Muslim insurance systems (*Takaful*) to the agriculture and rural sector. Specific actions include:
  (i) establishing a data collection system on the overall agricultural risk environment and demand for insurance services;

[27] The Committee on World Food Security (CFS) endorsed the RAI on 15 October 2014. Overarching values for the implementation of the Principles comprise human dignity, non-discrimination, equity and justice, gender equality, holistic and sustainable approach, consultation and participation, the rule of law, transparency, accountability and continuous improvement. Responsible investment should respect and not infringe on the human rights of others and address adverse human rights impacts. It should safeguard against dispossession of legitimate tenure rights and environmental damage.
[28] Formally endorsed through a largely consultative process by the CFS in 2012, the VGGT provide a set of principles and practices that can assist countries in establishing laws and policies that better govern land, fisheries and forest tenure rights, ultimately supporting food security and sustainable development.

(ii) thoroughly assessing the potential development of an agricultural insurance framework; and
(iii) piloting subsidized insurance schemes in partnership with insurance companies (and farmer organizations, once allowed to engage in financial commercial operations).

➔ *Relevant topics for policy dialogue*:
- Policy and public-private dialogues are required to facilitate **access to financial services** for agricultural entrepreneurs, and that will include **agricultural insurance schemes**. More specifically, the dialogue will touch upon the following points:
  - the possibility for cooperatives/associations to provide financial services (credit, insurance, emergency funds);
  - the most effective modalities for establishing and operationalizing an emergency fund to cover economic losses deriving from natural hazards;
  - creation and effective management (and appropriate institution) of a database on natural hazards risks; and
  - decision on the focus of awareness campaigns and who should run them.

IO 6.4 – Knowledge base for agriculture and rural development strengthened

Three of the foreseen projects in the 9th FYP complement each other with regards to improving the country's agricultural statistics: *updating of agricultural statistical data*; *surveys to calculate the GDP of the sector*; and a *geographical information unit*. They are, in turn, complemented by two projects aimed at strengthening *data storage, management capacities* and *related communication networks* to enhance outreach. In addition, the creation of an agricultural and fisheries information centre should ensure the production of comprehensive and coherent information and at least address the following SARDS 2040 recommendations.

Recommendations:

➔ *The approach to investment:*
- ***Systematize the planned interventions on agricultural statistics (also to serve the SARDS 2040 baseline)***: the three planned projects on statistics should be considered as equal priorities and implemented as one coordinated intervention. These projects should be used to introduce changes in the current system, which align it with the *Global Strategy to Improve Agricultural and Rural Statistics*, and upgrade the current database systems. They should also be focused on identifying missing data for the baseline and information requirements of the SARDS 2040.
- ***Mobilize technical assistance to improve the Agricultural Census and its intermediate surveys,*** integrating in the country approach the *Global Strategy and World Programme 2020 for the Agriculture Census*.
- ***Establish a SARDS 2040 M&E system in the MAF***, which envisages: (i) a definition of functions and tools for M&E data collection and analysis; (ii) strengthened capacities of MAF staff on results-based management, M&E and information systems; and (iii) the establishment of a geo-referenced management information system with the use of satellite imagery (which can be used to control land use and land use change, but also to monitor rangelands and forests).
- ***Strengthen the project planning system*** to ensure a results-oriented, public intervention design, including a brief cost-benefit analysis and the identification of specific key performance indicators, respectively to: (i) identify the potential profitability of the interventions for the beneficiary farmers; and (ii) pave the way for assessing progress towards results in a standardized manner (building on the SARDS RF indicators).
- ***Strengthen the MAF's data collection and management capacities***, with specific focus on the collection, storage and analysis of data and research related to agricultural investments by: (i) creating a private investors' database (which would help track the actual dynamics of the agriculture and rural sector along the lines of Riyada's database) and better respond to investors' demands; and (ii) strengthening the MAF's e-library system where all studies and regulations that relate to the agriculture and rural sector are stored and shared in order to systematize access and enhance outreach.

IO 6.5 – An effective innovation system for a competitive and sustainable agriculture implemented

This programme is set to restructure the way extension is conducted, ensuring that rural business capacities are strengthened in an efficient way and that the most appropriate models put in place are consistent with the SARDS 2040 objectives.

Public interventions: The 9th FYP has assigned the bulk of innovation funds to research and technology transfer projects, predominantly relevant to IOs 1.1, 1.3, 2.1 and 3.1 as they relate to extension activities and the provision of productive assets to producers. The scope of these projects has to be extended to post-harvest, food processing, honeybee products and niche products, such as pomegranate or olive oil.

Recommendations:

- ➔ *The approach to investment:*
  - ***Integrate all extension interventions in a system of smart subsidies and a comprehensive innovation system:*** The priority for the allocation of incentives should be given to networks of non-absentee producers and entrepreneurs having similar interests and farming systems. These networks should be identified by the MAF and receive support from the MAF's agricultural centres, specialized technicians, business incubators and research institutions. Research and extension activities (including experimenting with innovative technologies and practices) would be centred around private 'model' farms. Special support should be given to farmers benefiting from public subsidies conditioned to fulfilling a number of criteria (e.g., business plan milestones or implementation of particular practices). Public incentives for innovation would go beyond the provision of physical assets and consist also of study tours, free business planning assistance, etc. One single institution and management unit should coordinate all related research, extension and smart incentives schemes (e.g., on crop production, irrigation and salinity).
  - ***Establish an institutional learning process to ensure the capitalization of research:*** Knowledge-management and learning (KM&L) on the agriculture and rural sector should be hosted by the MAF and serve to benefit all MAF interventions. The KM&L mechanism would serve as a platform for establishing solid links between the MAF research and extension centres and international centres of reference (study tours for technicians on the particular implementation of new techniques, etc.). Associated activities would comprise lesson learning from success stories and analysis of business opportunities. All the technical assistance budgeted under this IO for the support of enterprises and financed through the OFIC (development projects to support OFIC investment activity) should create learning opportunities for MAF staff and farmers (study tours). All relevant findings from research should be utilized for policy dialogue and informed policy-making. A function to identify research results and establish links with extension should be created.
  - Establish a mechanism within the MAF to strengthen ***private investors' business planning capacities.*** Interventions comprise the preparation of training sessions for investors, but also the licensing and provision of incentives to private technical service providers (associations or private consultancies) to operate – a necessary condition for the sector's success.

- ➔ *Relevant topics for policy dialogue and institutional coordination*:
  - Enhancing production of knowledge requires collaboration with research centres and the SQU. The dialogue will aim to strengthen the University's research programmes and propose vocational training for farmers and local technicians;
  - Establishment of vocational training on key agricultural/agribusiness subjects, in partnership with the MOM and Riyada; and
  - Establishment of a veterinary medicine degree and adaptation of university curricula to generate adequate capacities (e.g., post-harvest, marketing, agroprocessing).

IO 6.6 – Social support to agriculture and rural development enhanced

The development and implementation of an appropriate development strategy has in many countries been one of the main engines for change in the agriculture and rural sector as it is the principal inductor of demand. The budget for the *Development of Means of Communication and Extension Services* project is probably underestimated, as an effective communication intervention will require hiring specialized services to tackle a multitude of issues both on the consumer and producer ends

(and using appropriate language and style): advantages of certain varieties of fruits and vegetables; characteristics of national products and of products from geographic indications (GIs); the safety of consuming certified products (GAP, IPM, HACCP, etc.); the habit of consuming fresh meat, vegetables and fruit; and the importance of on-farm hygiene or food traceability. The creation of regional brands for products (e.g., a Jebel Akhdar image) should also be considered.

The programme will aim to increase public awareness on the overall content of the SARDS 2040, with particular emphasis on preserving the social and natural resources base of the Omani culture and context. In general, the approach of raising awareness and communication will have to be carried out with support from professional advisory services in order to tailor content and messages to the audience. The establishment of a communication strategy for the SARDS 2040 will be one of the first outputs, which may get inspiration from techniques used in commercial marketing.

Recommendations:

- ➔ *The approach to investment:*
  - ***Provide generalized support to communicate and raise awareness around the content of the SARDS 2040***. The first action will be the preparation of a strategy and action plan to organize and systematize communication and awareness campaigns proposed by the SARDS 2040 in support of all its outcomes and programmes. These campaigns should be aligned with the implementation of related activities, and coordinated in time, and implemented in collaboration with other institutions (the Ministry of Information [MOI], MOCI, MRMWR, etc.). The plan will include campaigns aimed at increasing public awareness on:
    (i) changing the image of farming and improving education in agricultural-related fields;
    (ii) the role of agriculture beyond production (food safety, social and cultural values, environmental conservation, etc.);
    (iii) the value of differentiated products (GI, organic, mountain products, etc.);
    (iv) food safety and nutrition (including the promotion of Omani healthy food);
    (v) climate change adaptation and mitigation; and
    (vi) DRRM and resilience.
  - ***Promote communication campaigns aimed at attracting investment from international players***, for example, by establishing linkages and collaboration with already existing institutions (*Ithraa*) on government incentives and comparative advantages of the Sultanate of Oman in the agriculture and rural sector.
  - ***Advocate within the Government and with other actors*** for the adoption of the RAI and related adaptation of the VGGT.

- ➔ *Relevant topics for policy dialogue and institutional coordination*:
  - ***Establishment of a national framework for social responsibility in agrofood systems*** (agriculture and industry), through identification of key players who should agree on a conceptual framework for social responsibility, whose implementation will have to be monitored.
  - ***Integration of topics relevant for the SARDS 2040 in school curricula,*** comprising, among others: environmental sustainability; mitigation of climate change; nutrition and healthy food; national food; and the introduction of school gardens as an awareness tool (as advocated in the nutrition strategy).

Main partners in the proposed interventions in Outcome 6

Intermediate outcome	Intervention	Main partners
IO 6.1	Study and policy dialogue on return to water	MRMWR, SQU
IO 6.1	Study and policy dialogue on labour requirements for agriculture	MOM, OCCI
IO 6.1	Reform of the legal framework on associations, producer organizations and cooperatives	MSD
IO 6.1	Study and policy dialogue on land reform and land zoning	MOHO, MRMWR, SQU
IO 6.1	Study and policy dialogue on land degradation	MRMWR, MECA
IO 6.1	Study and policy dialogue on CSOs and potential for agriculture	MSD, OCCI, Riyada
IO 6.1	Study and policy dialogue on national investment gap	MOF, OCCI, Ithraa, MOFA
IO 6.1	Study on labour productivity and skills, and policy dialogue on labour regulation	MOM, CSOs

Intermediate outcome	Intervention	Main partners
IO 6.1	Studies on access to land, land consolidation and policy dialogue around the land law	MOHO, MRMWR, CSOs
IO 6.1	Policy dialogue on biosecurity and food safety standards legislation	MAF, MOCI, MRMWR
IO 6.1	Policy dialogue on the adoption of the RAI	MOF, MOCI, MOFA
IO 6.1	Mainstreaming of agriculture into climate change adaptation, disaster risk management and mitigation strategies	MECA, MRMWR
IO 6.1	Dialogue on the contribution of agriculture and rural development to food security	MOH, PASFR, FSC (OCCI)
IO 6.2	Advocacy on the common strategy for technical and financial assistance	PASME, ODB, Al Raffd Fund, MOT, MOF
IO 6.2	Study on the regulation of prices and enforcement of the anti-trust law	MOF, MOCI, PASFR, PACP
IO 6.3	Study on the potential for additional financial services, including insurance	MOF, CBO, ODB, private banks, insurance companies, Riyada, OCCI
IO 6.4	Coordination and improvement of sectoral statistics	NCSI
IO 6.5	Strengthening of the MAF's e-library and knowledge management	TRC, SQU
IO 6.6	Generalized support to communicate and raise awareness around the content of the SARDS 2040	MOI, MHE, MHC, MSD, MOH, MECA, OCCI, Riyada, MOM, MRMWR, CBO, NCSI
IO 6.6	Establishment of a national framework for social responsibility in the agrofood system	OCCI, MOF
IO 6.6	Integration in school curricula of topics relevant to the SARDS 2040	MHE, SQU, TRC

4.4 The role of the private sector

This section frames the proposals and priorities of the IP within a rationale for increased support from the Government of Oman for private investment. The following key arguments and basic assumptions are based on findings from the 2012 *State of Food and Agriculture: Investing in Agriculture for a Better Future* (FAO-SOFA, 2012):

- **Private investment by farmers** is the **largest source of investment** in agriculture. Public investments represent a steady contribution to the development of the sector, while **FDI in agriculture** (even though it has increased in recent years) and Overseas Development Assistance (ODA) represent a limited portion of total flows to agriculture (see Figure 14).

- **Large-scale corporate investment** can contribute to filling investment gaps, support the transfer of technology and know-how or generate employment as well as export earnings; however, it can also be associated with negative social and environmental impacts, *inter alia,* the depletion of water, and requires close supervision by strong national institutions.

- An oft-verified **mismatch between farmers' supply and existing demand** hampers farmers' access to markets; **agro-industry development is needed** to match consumer demand for food to primary producers and to ensure an effective transmission of incentives to farmers.

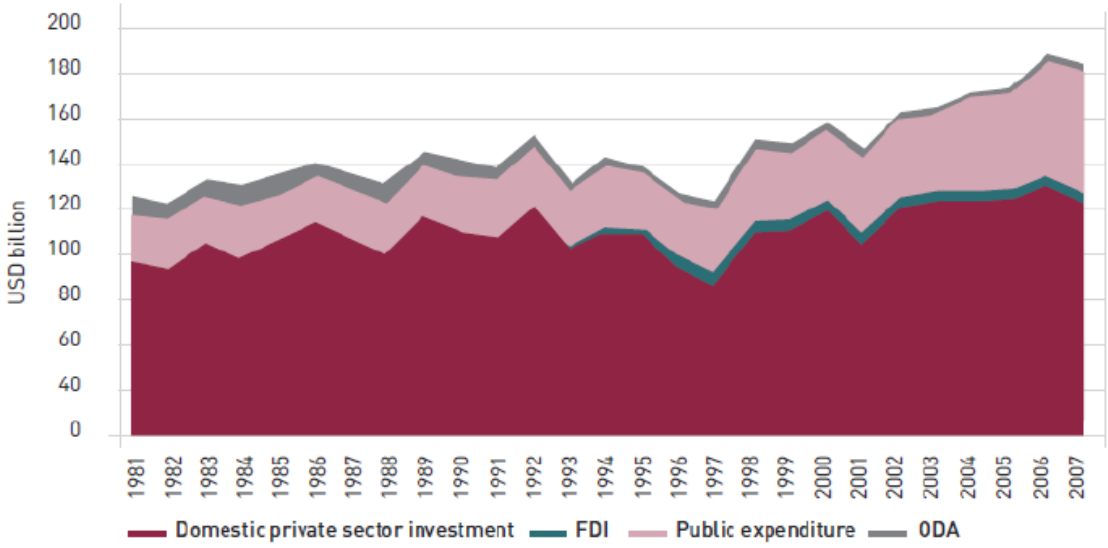
- The **investment climate shapes the opportunities and incentives for firms to invest** productively, create jobs and expand.[29]

- The balance of existing evidence suggests that **in many countries investments in research and development (R&D), infrastructure, education and other public goods can have much higher returns** than public investments in agricultural inputs.

[29] According to the World Bank (2004), government interventions to improve the investment climate include: ensuring rights to land and other property; improving and enforcing regulation domestically and at the border; providing infrastructure and financial market institutions; and facilitating labour markets by fostering a skilled workforce and crafting flexible and fair labour regulation.

- **Some public sector incentives can have a perverse effect**, such as an excessive use of fertilizer, or faster depletion of groundwater, rather than fostering sustainable development and sector growth.

Figure 14 - Components of agricultural investment for a sample of 31 developing countries



Note: In developed countries, where farmers have more investment capacities and where more effective financial services exist, the share of public investment is lower. Source: ODI, 2012.[30]

Even if not explicitly discussed during the formulation of the IP, these premises from the 2012 FAO SOFA report set the tone for the design of the SARDS 2040 and its IP. As such, both documents:

i) **focus on the development of existing farming systems**, even if they also recognize the need to facilitate large private investments in agriculture (for example, by enforcing a conducive law for FDI in agriculture), while ensuring private sector's respect for the RAI;

ii) **give priority to interventions in the development of agro-industries and marketing capacities** (in addition to those on water use sustainability);

iii) **devote one of its outcomes to improving the investment climate** and capacities of the public sector to take informed decisions throughout the process of licensing and technical clearance of private sector investment proposals (Outcome 6 - Enabling institutional environment for agriculture and rural development strengthened); and

iv) **propose a reform of the incentives system**, which shies away from input subsidies and focuses on compensation for the achievement of results.

Additionally, the priorities set in the IP address the major factors that influence the competitiveness of the Omani agriculture and rural sector according to the strengths, weaknesses, opportunities and threats analysis (SWOT) undertaken for the drafting of the SARDS 2040,[31] and categorized as:[32]

- essential enablers: trade policy, infrastructure, land tenure and property rights;
- important enablers: financial services, R&D, standards and regulations; and
- useful enablers*:* business linkages and business development services.

To these, the 2012 FAO SOFA report adds a fourth enabler, also in line with the priorities set for the Omani agriculture and rural sector in the SARDS IP: the creation of social capital through the strengthening of producer organizations in order for farmers to overcome constraints in accessing knowledge, markets and finance, or in managing risk.

[30] ODI, 2012: The strategic role of the private sector in agriculture and rural development, London (commissioned by the Global Donor Platform for Rural Development).
[31] Reference to Section 5.3 of the SARDS.
[32] Christy, R., Mabaya, E., Wilson, N., Mutambatsere, E. & Mhlang, N. 2009. Enabling, environments for competitive agro-industries. *In* C.A. da Silva, D. Baker, A.W. Shepard, C. Jenane and S. Mirandada-Cruz, eds. *Agro-industries for development,* pp.136–85. Rome, FAO and UNIDO (United Nations Industrial Development Organization).

A Table in Annex III describes in more detail how the IP proposes that the Government of Oman acts on these private sector enablers. The summary presented in the table reinforces the idea that the competitiveness of the agriculture and rural sector in the Sultanate of Oman does not depend solely on the actions directly taken by the MAF, but requires the coordinated intervention of a plethora of national institutions.

5. Implementation arrangements

Results-oriented planning, role of MAF and others, coordination and finance

The IP promotes accountability and results-orientation, seeks to facilitate and render flexible the management of the SARDS 2040, and provides a framework to leverage public and private investments. Hence, implementation of the SARDS 2040 requires changes in both project planning and design processes of the ministries and in their M&E capacities. This section devises appropriate and well-tailored arrangements for the management of investment operations and for resource mobilization in order to achieve the SARDS 2040 objectives. Section 6 describes the related M&E and learning arrangements.

5.1 Planning and management responsibility

Given that the SARDS 2040 is a national strategy, its formulation required the strong involvement of a large number of departments and institutions. Although the scope of its interventions extends beyond the mandate of the MAF, the latter will be the institution responsible for its implementation, monitoring and evaluation. The Supreme Council for Planning (SCP) will oversee the SARDS implementation and the achievement of results. Effective SARDS 2040 implementation will require the solid engagement of leading institutions in the country, namely: the DRC, the RCA and the Office of the Vision 2040. Many investments and policy reforms that do not fall under the MAF's specific mandate will require the establishment of specific committees or working groups for policy dialogue and reform, comprising a number of relevant ministries and chaired or coordinated by members of higher-level institutions.

In this context, **the MAF is responsible not only for implementing projects and other initiatives directly related to agriculture, but also for initiating and convening inter-institutional coordination and policy dialogue on different subjects addressed by the SARDS 2040**. It should lead this inter-institutional coordination and policy-making facilitation, as appropriate, or delegate these functions to higher-level institutions such as the office of the SCP or the RCA. However, the MAF is mainly responsible for the day-to-day planning and management of SARDS 2040 implementation. It should take a leading role in:

i. planning and implementing the MAF's public interventions;
ii. stimulating SARDS-related private investments and PPPs;
iii. collaborating with other institutions (e.g., on licensing, or when permits or concessions granted by other ministries are required); and
iv. advocating for other institutions to plan and implement priority interventions of the SARDS 2040 not under the MAF's mandate.

MAF interventions must be made bearing in mind the utmost importance of **stimulating private sector investments** and **supporting the development of agribusinesses** for the success of the IP (Section 4.4 provides the rationale and overview of the main enablers). Broadly speaking, the MAF will have to focus on: (i) providing technical guidance and advisory services to interested investors; (ii) ensuring an effective process to provide the required technical clearance on the investment proposals (e.g., for licensing, or for permits from other ministries); and (iii) facilitating private-public dialogue, acting as a broker between the investors and the institutions. Most of the work is relevant to Outcome 6, and more thoroughly described in the respective section.

In undertaking the above, the MAF needs to set up a ***tailored implementation mechanism*** for the interventions under its mandate, and a ***policy dialogue and inter-institutional coordination mechanism*** to facilitate the interventions of other institutions and ministries, as well as PPPs.

5.1.1 Structure of interventions and management functions within the MAF

The SARDS IP is designed and managed as a set of programmes, having a broader scope compared with the individual projects (as in the project proposals for the 9th FYP). The SARDS 2040 and its IP are proposing a shift ***from project-based implementation towards programme-based***

implementation, where the objectives of the 'ex-projects' are now addressed through the implementation of IOs, or programmes. The implementation of SARDS 2040 entails 21 programmes or IOs. Thus, at MAF level, the SARDS IP proposes to streamline the planning and design of projects, and a management structure with clear responsibilities according to the level of result: (i) outcome; (ii) IO; and (iii) implementation of individual interventions. As planning and implementation are only part of the whole investment cycle, the implementation responsibilities are coupled with monitoring ones. Hence each IO coordinator would be responsible for monitoring and reporting on the indicators related to its activities, whereas overall coordination of monitoring and evaluation activities, data quality assurance and aggregate reporting would be under the responsibility of a dedicated unit within the MAF (see also the SARDS document, and the Chapter 6 of the IP). Figure 15 provides a synthesis of the roles and responsibilities using IO 1.1 as an example.

Figure 15 - Management of public investments and interventions at programme level

Outcome 1	MAF projects and IP priority interventions contributing to IO 1.1 constitute a **programme 1.1**		A set of programmes represents a broader programmatic intervention corresponding to Outcome 1: Crop sector competitiveness increased.
Intermediate Outcome 1.1: Adequate farming technologies and practices promoted and crop yield, value and nutritional quality increased ***Leadership:*** *selected department director*	Deployment of conventional palm seedling special varieties *Responsible*: DG Agriculture *Budget*: OMR 1.5 million		• **Part of an outcome-level programme**: The whole set of detailed actions is aggregated to constitute the ***broader programme*** that contributes to achieving the aims of Outcome 1: Crop sector competitiveness increased. ➔ **Overall supervision of the outcome level is with the Undersecretary (with support from DGPD and selected directorates general as appropriate).** • **Programme management**: Depending on the nature of the interventions, some can be clustered as programme components (on an ad hoc basis). Overall responsibility for component management is assigned to a **director-general or departmental director** of the MAF, who will supervise implementation of the agreed activities, ensuring annual planning and reporting on the interventions' progress (against key performance indicators). • **Intervention implementation*:*** Specific responsibility for implementation of the individual set of actions corresponding to the former project level is assigned to the most suitable officers in the MAF, who will guarantee timely implementation of the planned interventions, as agreed at planning stage, and data gathering on intervention progress (against key performance indicators). By nature, such a role belongs to the directorate general responsible for the original project request. • **Reporting (and management) line:** officers responsible for implementation -> IO coordinator (director-general or director) -> Outcome manager (Undersecretary assisted by the director-generals).
	Integrated replacement and renewal of date palm village *aflaj* *Responsible*: DG Agriculture *Budget*: OMR 3.5 million		
	Development and deployment of Oman's comparative advantage in crops *Responsible*: DG Agriculture *Budget*: OMR 0.5 million		
	Research on monitoring and evaluating palm genetic resources *Responsible*: DG Research *Budget*: OMR 0.8 million		
	Enhancement of date palm tissue culture production *Responsible*: DG Research *Budget*: OMR 4.0 million		
	Genetic engineering research to improve crops *Responsible*: DG Research *Budget*: OMR 0.9 million		
	Raising of tropical and deciduous fruit productivity *Responsible*: DG Research *Budget*: OMR 1.5 million		

In terms of implementation capacities, during the preparation of the SARDS and the IP the need for structural or organizational changes of MAF did not emerge as a priority: rather, MAF is considered to be endowed with all relevant general directorates and units to implement the plans. Nevertheless, individual or organizational capacity development is required. As such needs for specific improved capacities should be provided by ad-hoc temporary technical advisors (see for example in IO 2.2, the suggestion of constituting a 'technical council' on poultry) or technical assistance projects. These experts would be temporarily part of the MAF and would contribute and coach its staff in developing new implementation mechanisms and work procedures as well as individual capacity of existing or

new MAF staff to better respond to the sector needs. These 'technical councils' or advisory positions would cease to exist once the MAF directorates were able to assume the functions in full capacity.

5.1.2 Inter-institutional coordination mechanisms

Through proactive and sustained initiatives convened by the MAF, and in close coordination with the above-mentioned institutions, working groups of staff from ministries and relevant Government and civil society institutions need to be established around the main domains of intervention, to progress towards achieving SARDS 2040 outcomes. For specific topics, the MAF will work closely and coordinate with other institutions through strategic partnerships managed by selected officers of the MAF, under the overall supervision of the respective outcome leaders. For example, the project for water management in Al Batinah (IO 3.1) and the creation of a water metering system require strong partnership with the MRMWR. Similarly, implementation of IO 6.3 requires strong coordination with the ODB and Al Raffd Fund or private insurance companies for the expansion of financial services, including agricultural insurance. The integration of the MAF functions within the existing *InvestEasy*[33] portal or the *Omuna* portal[34], the 'one-stop shop' where multiple public services are offered to investors, will also require strong joint planning and regulatory adjustments agreed between the MOHO, MRMWR and MAF.

5.2 Financing and resource mobilization

In the 9th FYP, the MAF envisaged an allocation of MAF financial resources to key intervention areas. However, the SARDS 2040 has provided a new framework to guide such investments, and part of the proposed allocation of resources and projects that compose the 9th FYP will require restructuring. For example, the MAF had allocated resources to improving statistical information and the knowledge base for the development of an innovative system of information exchange and awareness campaigns. The allocated resources will only be able to partially fill the financial requirements of the proposed interventions. In order to fill these gaps, other institutions, such as the NCSI for statistics or the MOCI for awareness should contribute to financing the proposed interventions (which are also relevant for achieving their respective objectives). In addition, there are intervention areas with no budget assigned, e.g., for policy dialogue and institutional coordination on the reforms of the legal and policy framework, for improving the economic environment for private investors or for facilitating financial inclusion. These activities will require a budget reallocation from the MAF (e.g., to finance key studies), but also collaboration from other institutions such as the MOCI, the MRMWR or consultancies for regulation reform, or the private sector on the development and testing of financial products.

Financial support can also be sought from other national institutions such as the AFDF – which, since its establishment in 2006, has acted as a reliable partner to the MAF – or multilateral institutions and development banks to ensure not only the mobilization of resources, but also the expertise required for some of the SARDS 2040 programmes. Specific reference is made to institutions such as the Islamic Development Bank, the International Finance Corporation and the World Bank Group (currently collaborating on the national strategy for fisheries).

[33] *InvestEasy* portal: https://www.business.gov.om/wps/portal/. Currently, agricultural-related services are not included.
[34] MAF is instead part of the services provided by the Oman Portal, mostly for services related to permits to import a selected list of commodities or for veterinary medicies and vaccines: https://omanportal.gov.om/wps/portal/index/eservices.

6. Monitoring, evaluation and learning system

Establishing M&E functions, key performance indicators, analysis and communication

The IP provides a framework to guide public institutions in allocating resources, with the aim of progressing towards the SARDS 2040 objectives and expected results. To ensure consistency and harmonization, the SARDS 2040 performance is monitored by selected SARDS results indicators and additional key performance indicators that the MAF finds appropriate for measuring progress.

This section specifies the key M&E functions in the MAF, including responsibilities for regular monitoring of the SARDS 2040 results by annually collecting and reporting on the relevant indicators (physical and financial). Part of the section is dedicated to the adoption of key performance indicators, identified for each intervention, to ensure regular feedback from operations and to guide programme management.

M&E to reward success

- If you do not measure results, you cannot tell success from failure
- If you cannot see success, you cannot reward it
- If you cannot reward success, you are probably rewarding failure
- If you cannot see success you cannot learn from it
- If you cannot recognize failure, you cannot correct it
- If you can demonstrate results, you can win public support

(World Bank, Results-based monitoring and evaluation systems, 2004)

6.1 The SARDS IP results architecture

The SARDS RF consists of a four-level results chain**,** whereby the ultimate impact is articulated into six outcomes and 21 IOs (Figure 16). These are, in turn, structured in a number of outputs resulting from the investment operations actually carried out (i.e., not defined at SARDS planning level as too specific and related to the actual allocation of resources, but to be defined along the design, budgeting and approval of the interventions). For the IP as well as the SARDS 2040, the outputs, IOs, outcomes and impact are all referred to as **results**.

Each level of SARDS 2040 results has a set of SMART indicators,[35] including a baseline value, indicating the level of the indicator at the beginning of implementation and a time frame within which to achieve the associated target. The target is the value of the indicator that is expected to be achieved at the end of implementation and within the intermediate time periods.

1. **Impact level** monitoring corresponds to the Vision of SARDS 2040, conforming to the broader national development objectives of the Vision 2020 and adjusted to the Vision 2040 (when issued). The impact level reflects the intended improved performance of the agriculture and rural sector and sustainability of natural resources, not only the product of SARDS 2040 implementation.

2. **Outcome level** monitoring corresponds to the six main SARDS objectives. These reflect the intended institutional, organizational and individual improvements in the specific subsectors of the SARDS mostly attributable to the SARDS programmes.

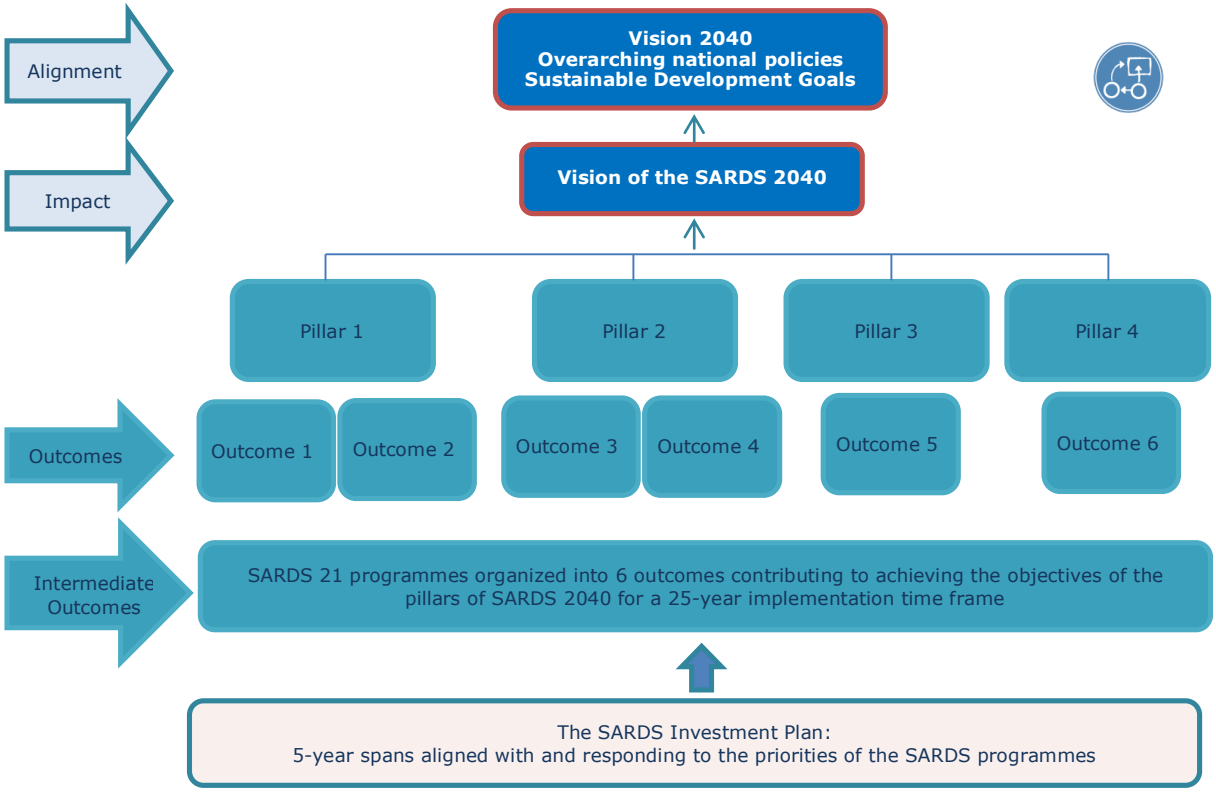
3. **IO level** monitoring corresponds to mid-term development results that interventions (i.e., projects and other initiatives) seek to directly support. The 21 IOs are a disaggregation of the six outcomes, and represent behavioural or structural changes and other improvements that contribute to the achievement of the outcome to which they belong. Their progress is largely attributable to the interventions of the SARDS 2040; in operational terms they are referred to as "programmes".

4. **Output level** monitoring refers to the most disaggregated level of results, corresponding to individual interventions. They reflect all the various activities foreseen within the IP: public investment, PPPs, activities conducive to policy reform, etc. *Key performance indicators* will be

[35] **SMART** is an acronym usually utilized in results-based management to indicate the five feature of the indicators: **Specific** - related to the results the interventions intend to achieve; **Measurable** - stated in quantifiable terms; **Achievable -** realistic in what is to be achieved; **Relevant** - useful for management information purposes; **Time-bound -** stated with target dates.

associated with the interventions, according to their nature. Monitoring of SARDS IP interventions not only includes key performance indicators, but also the financial execution of ongoing interventions, the mobilization of private resources and the filling of possible financing gaps. Thus, monitoring of interventions' execution (outputs) will also include an update of the financial requirements for the completion of the programmes (IOs) (see section below on the monitoring system).

Figure 16 – The results architecture of the IP integrated into the SARDS



6.2 Establishment of monitoring, evaluation and learning functions

The M&E and learning system of the SARDS IP is guided by the same principles of the SARDS 2040, with a specific emphasis on: (i) **accountability**, through transparency and availability of the data and related analyses, as well as knowledge sharing; (ii) **ownership** by national institutions, first of all the MAF, through its involvement in planning, evaluation and lessons learning; (iii) **participation** of stakeholders at all levels; (iv) **simplicity** of the system and its indicators in order to facilitate data collection and analysis; and (v) **consistency** with the existing M&E national systems.

The aim of the M&E system is three-fold:

(i) ***To ensure that appropriate information is collected*** throughout implementation, thus providing the basis for project evaluation and lessons learning;

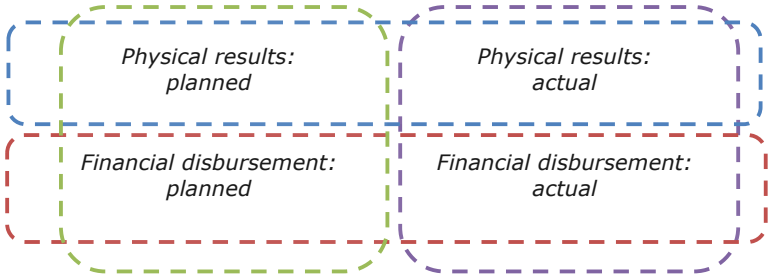
(ii) ***To provide regular information on implementation progress*** and guide the SARDS IP programme implementation, taking corrective action for improving and/or reorienting activities and approaches, or reallocating resources; and

(iii) ***To provide the basis for advocacy, knowledge dissemination and sharing***, through the publication of regular reports and adoption of a wide variety of communication tools based on information from measured results.

6.2.1 Monitoring physical and financial progress

Monitoring of progress towards the results of the SARDS IP will require a cross-check between the projects' physical implementation and the corresponding financial progress on disbursement (as shown in Figure 17). Physical progress will be monitored through the SARDS RF indicators, while for the financial disbursements all involved ministries will provide updated figures on public spending at the end of every cycle (on an annual and five-year basis).

Figure 17 – Comparing the physical and financial dimensions, crossing information on actual achievements versus planned targets

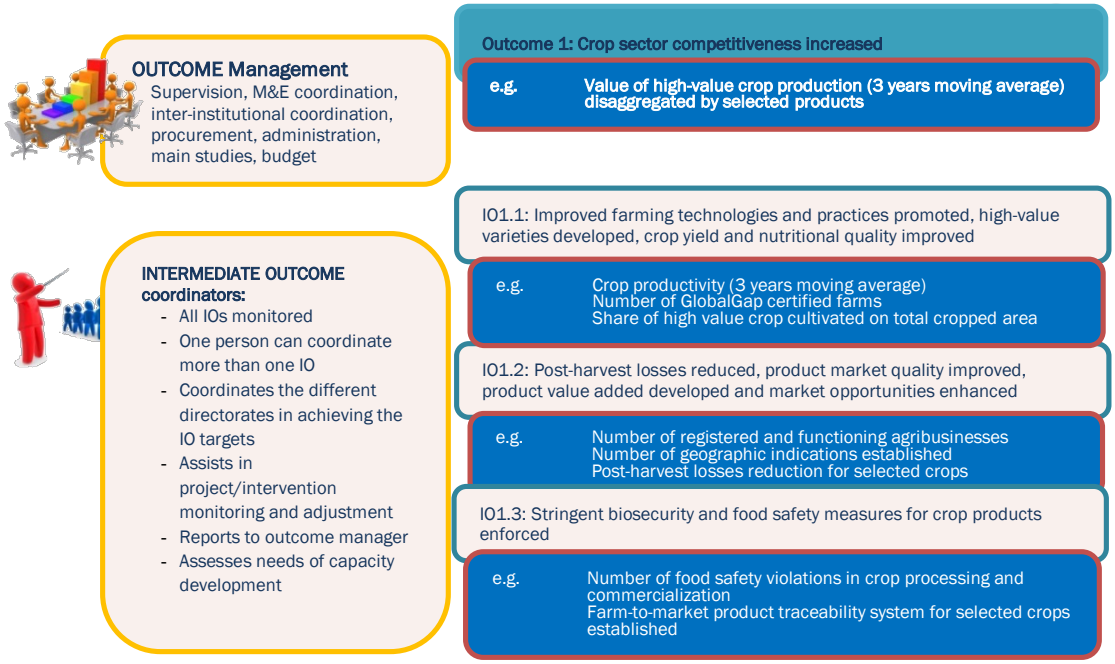


6.2.2 Operationalization of the M&E system

The MAF will play the leading role in managing SARDS M&E and learning. Officials from the MAF or relevant partner implementing agencies will collect information on physical progress. These officials will have to be identified and trained on M&E and the budget for baseline surveys/supervision visits/data collection provided.

The overall supervision on data collection and analysis is given to senior officials of the relevant department or directorate general (respectively for programmes or outcomes). The DGPD, and more specifically the responsible unit for M&E, will assist the senior officials in these tasks and produce aggregated annual reports on achievement of results. Figure 18 summarizes, on the left, the M&E and main managerial functions associated with outcome and IO managers. On the right are examples of indicators associated with public interventions under each level of result.

Figure 18 – Results-based management and monitoring



6.3 Key performance indicators

Key performance indicators are mostly associated with public interventions. The responsibility for their selection and data collection lies completely with the implementing institution. Indicators are selected according to criteria of relevance and simplicity.

Outcome and IO level key performance indicators can be selected from the list of indicators of the SARDS RF, or added in order to capture dimensions that are not sufficiently represented in the SARDS indicators. Each intervention (e.g., project) will have at least one key performance indicator from the SARDS RF, ensuring that the intervention is relevant to at least one IO. In general, each intervention has a range of three to five key performance indicators at outcome level.

Output level key performance indicators are intervention specific as they represent the products and services generated by the interventions/projects themselves. At output level, key performance indicators are selected to capture progress on implementation (e.g., number of farmers benefitting from subsidies, number of studies, number of vaccines distributed, etc.). At this level, indicators are disaggregated by geographic location, by product or service, by gender and nationality, etc., with the aim to ensure a more detailed description of physical progress and to guide management for ensuring results at the outcome level.

6.4 Analysis, reporting, communication and advocacy

Analysis is carried out on an annual basis and overall responsibility to communicate data for advocacy lies with senior officials of the MAF. M&E findings from the IP implementation are analysed and discussed in SARDS annual review meetings, led by the MAF, in coordination with key institutions in the country. The meetings aim to inform decisions on improvements and advocate for financial commitments. To ensure greater participation and broader advocacy potential, all concerned public institutions, private sector representatives, civil society organizations and other institutions are invited to the meetings.

The meetings are linked with the aims of Outcome 6, *contributing to strengthening an enabling institutional environment.* The DGPD plays a critical role in the IP monitoring and acts as secretariat to the annual meetings.

A specific monitoring and reporting plan will need to be developed within the first six months of SARDS 2040 implementation, specifying actions, responsibilities and a time frame for reporting and communication. The plan will also help fill the existing gap in baseline information and streamline the planning for recurrent M&E activities.

7. Assumptions and major risks

Assumptions, opportunities and risks in implementation of the SARDS 2040

Investment is not a one-off process in which all decisions are made at the start of a cycle. When formulating the SARDS 2040 and planning for investments, a number of assumptions were made with regards to the adoption of the proposed interventions, implementers' disbursement capacity or policy framework changes. The fact that these assumptions may not hold poses risks to the achievement of the expected SARDS results.

The table below summarizes the major risks associated with the implementation and management of SARDS 2040, with a specific focus on the IP. Each risk provides a description of its possible impact on achieving SARDS 2040 objectives and the mitigation measures that should be adopted. All mitigation measures are already part of the IP, but they are presented here as they represent implementation priorities and/or areas that require close and periodic monitoring.

Major Risk	***Impact on IP implementation***	***Probability***	***Mitigation measure***
Oil price remains below USD 60/barrel in the medium term	*MAF and other ministries could only invest limited amounts of public funds in agriculture.*	*High*	*At planning: prioritize small public investments that can lead to larger private sector investment (e.g., regulation)* *At implementation: ensure adequate monitoring to focus investment in the areas lagging behind and that are key bottlenecks to development*
Different institutional interests (e.g., on water metering)	*SARDS 2040 cohesive approach is not applicable and the scope of policy and regulatory framework reform is not sufficiently broad.*	*Medium*	*Establish a supra-ministerial coordination (SCP) of key matters and engage in open policy dialogue fora; advocate at the highest political levels, using evidence-based studies, on the need for reform; reform the management structure of the MAF and attribute clear responsibilities for the achievement of the SARDS 2040 targets to key staff to keep the MAF team mobilized to actively engage with other institutions.*
The MAF and other government interventions are not well coordinated	*Issues that require strong coordination such as feed quality, food safety, legal reforms or water management will not be tackled.*	*High*	
Delays in organization for IP implementation	*Reduction of potential results due to delays between planning and inception of public interventions*	*High*	*Provide clear guidance at the initial stage; senior officials have to provide a clear vision to staff, establish strong management mandates per IO and outcome and develop staff capacity in key areas*
The MAF cannot develop the necessary internal capacity to deal with key technical issues for SARDS 2040 implementation	*The solutions and priorities set to deal with problems might not be the most efficient and effective, leading to delays in implementation, unnecessary spending and underachievement of results.*	*Medium*	*As a priority, put in place a set of capacity development strategies for the MAF. These can be: creating technical committees of international subject matter experts; educating veterinarians in the country; enabling the constitution of private technical assistance providers in the country; engaging in cross-learning within the country (with OFIC or* the One Million Date Palm *project experience); enabling the setting of independent certification and inspection bodies in agriculture (on food safety, organic agriculture, compliance with subsidy programmes, etc.).*
Legal and financial frameworks are not conducive to private investment	*Agriculture will remain an unattractive sector and public investment will not leverage the necessary private sector contribution.*	*High*	*Give priority to resolving the legal and institutional bottlenecks identified in the SARDS 2040 with regards to new enterprise licensing, price setting for differentiated products, labour and land, in particular invest in sound land use*

Major Risk	Impact on IP implementation	Probability	Mitigation measure
			planning and clear licensing criteria for agriculture.
Insufficient capacity to manage PPPs	*Investments add little value to the products, and fail to attract local suppliers and motivate change in practices at farm level.*		*Hire experienced managers in the international market; support managers to learn from experience (study tours, etc.); partner with institutions that can provide adequate technical assistance; and constantly monitor performance (sales) and target achievements.*
Research investments are not made where most needed	*Investment in research is not made where improvements are demanded, or the results from research are never widely adopted.*	*Medium*	*Integrate research in a general planning system for innovation in which part of the research is done on-farm with farmers' participation, and all research departments work closely with farmers; establish applied research centres, such as a camel centre, for the development of products and practices aimed at the development of key value chains.*
Insufficient change in some value chain tiers compromises the effectiveness of investment along the value chain	*Failure to develop adequate post-harvest and marketing facilities, for example, will jeopardize any efforts to improve production on-farm; market outlets and price differentiation are not guaranteed.*	*Medium*	*Set as a priority the development of value chain tiers lagging behind, untying current bottlenecks (e.g., grading and food safety regulations, price setting, etc.) and providing technical assistance for the implementation of projects at the highest international standards (hiring a panel of experts if necessary); partner with institutions with experience in business plan formulation, incubation, branding, traceability, international promotion, etc., in providing support to the private sector.*
Low capacity to mobilize farmers and provide adequate support	*Farmers continue to act individually with heterogeneous and generally low levels of product quality and water productivity.*	*High*	*PPP enterprises hire technicians to assist suppliers in responding to companies' quality requirements; train the MAF's staff and PPP enterprise technicians on international best standards and all relevant issues; enable the provision of private technical assistance services; mainstream research activities into private farms; identify and support private model farms.*
Low farmer acceptance of proposed changes	*Key issues such as sustainable water management, rezoning of degraded land, adequate rangeland management, improved livestock breeding and health practices will not be implemented.*	*Medium*	*Start interventions focusing on key areas of the country and small networks of farmers; identify best practitioners among farmers and support them in leading by example; restructure the incentives system; improve integration between government support to research, production and marketing (e.g., on-farm research, technical assistance to farmers provided by processing enterprises)*
Aged or absent farmers are resistant or not interested in change	*Best agricultural or livestock management practices are not implemented, and there is no organized supply for processing activities.*	*Medium*	*Create a rejuvenation programme (early retirement/rural pensions); improve targeting of subsidies and technical assistance; reform incentive systems to remunerate actual achievements.*
Foreign workers effectively managing farms do not have the incentive to change	*Best agricultural or livestock management practices are not implemented, and there is no organized supply for processing activities.*	*High*	*Improve land leasing regulations to provide more security to land renters and stimulate investment; engage foreign workers and managers, in particular, in technical assistance and cross-learning activities (study tours, model farm visits, research).*
Lack of biosecurity endangers the development of key sectors	*Crop pests and diseases continue to compromise production, and animal diseases render*	*High*	*Set as one priority the establishment of appropriate monitoring systems (including animal identification), the*

Major Risk	Impact on IP implementation	Probability	Mitigation measure
	productivity low and animals unsuitable for quality markets		*education of veterinarians in the country and disease control projects.*
There is not enough support from the Omani society to sustain the foreseen changes in the SARDS 2040	*The Omani society at large is not sensitized on the importance of improved quality products or Omani products (or ready to pay a premium). It is also not sensitized on the need to improve water management. Without society's support, the Government does not feel pressure to push for necessary changes, nor do farmers feel compelled to abide by the regulations or pay penalties for non-compliance.*	*High*	*Select key issues for key awareness campaigns and education interventions and contract professional experienced institutions to design and implement them.*

The risk matrix will only be useful if an adequate monitoring and information system is developed for the SARDS 2040. Otherwise, identification of the occurrence of the risks described above might not be timely enough, or not occur at all, and corrective mitigations measures or priority adjustments to the proposed interventions will not be carried out.

8. The way forward

The availability of the IP allows the MAF (but other institutions as well) to adjust the planned interventions in a results-oriented manner, contributing more effectively to the identified priorities. In addition, it allows for dialogue with all stakeholders, helping to identify and eliminate policy bottlenecks, thus reducing the constraints for stronger private sector participation.

The key steps in the short term for the implementation of the SARDS 2040 IP include:

- Establishing within the MAF the implementation arrangements to ensure that once the 9th FYP budget allocation to the MAF is confirmed the projects can be launched, i.e. nominating outcome and IO coordinators at general director and director levels.

- Identifying (by the outcome and/or the IO coordinators under the supervision of the Under Secretary) the immediate priority actions (first 12-month planning) which can be implemented with available budget under each IO.

- Attributing the responsibilities for the implementation of individual actions to directors, division leaders or relevant officers.

- Establishing within the MAF the M&E functions, including the identification of the central coordination unit and the attribution of clear M&E responsibilities to each O and IO coordinator in order to ensure that the results of the operations are captured;

- Starting to mobilize technical expertise to address the most complex issues (such as enforcement of the water law, the Poultry Council or the regulation of private investments and producers organization);

- Establishing a dialogue with the highest authorities in the country (the Cabinet, the SCP, the Vision 2040, etc.), starting by presenting the SARDS 2040 and its IP to ensure feedback and commitment for its implementation; and

- Establishing a dialogue with peer ministries to disseminate the content of the SARDS 2040 and advocating for contributions to the achievement of its goals.

The implementation of the IP should be guided by first addressing the top priorities (water metering, progressing towards a system of *smart* incentives, institutional reforms on associations, labour, land planning, financial services and the launching of the pilot rural development programme).

In the medium term, the design of the Vision 2040 represents the first milestone. The Vision 2040 will be presented in 2018. This gives the MAF an opportunity to use the SARDS 2040 and its IP as a reference to influence national priorities and advocate for the role of the agriculture and rural sector in the socio-economic dynamics of the coming 25 years.

Annexes

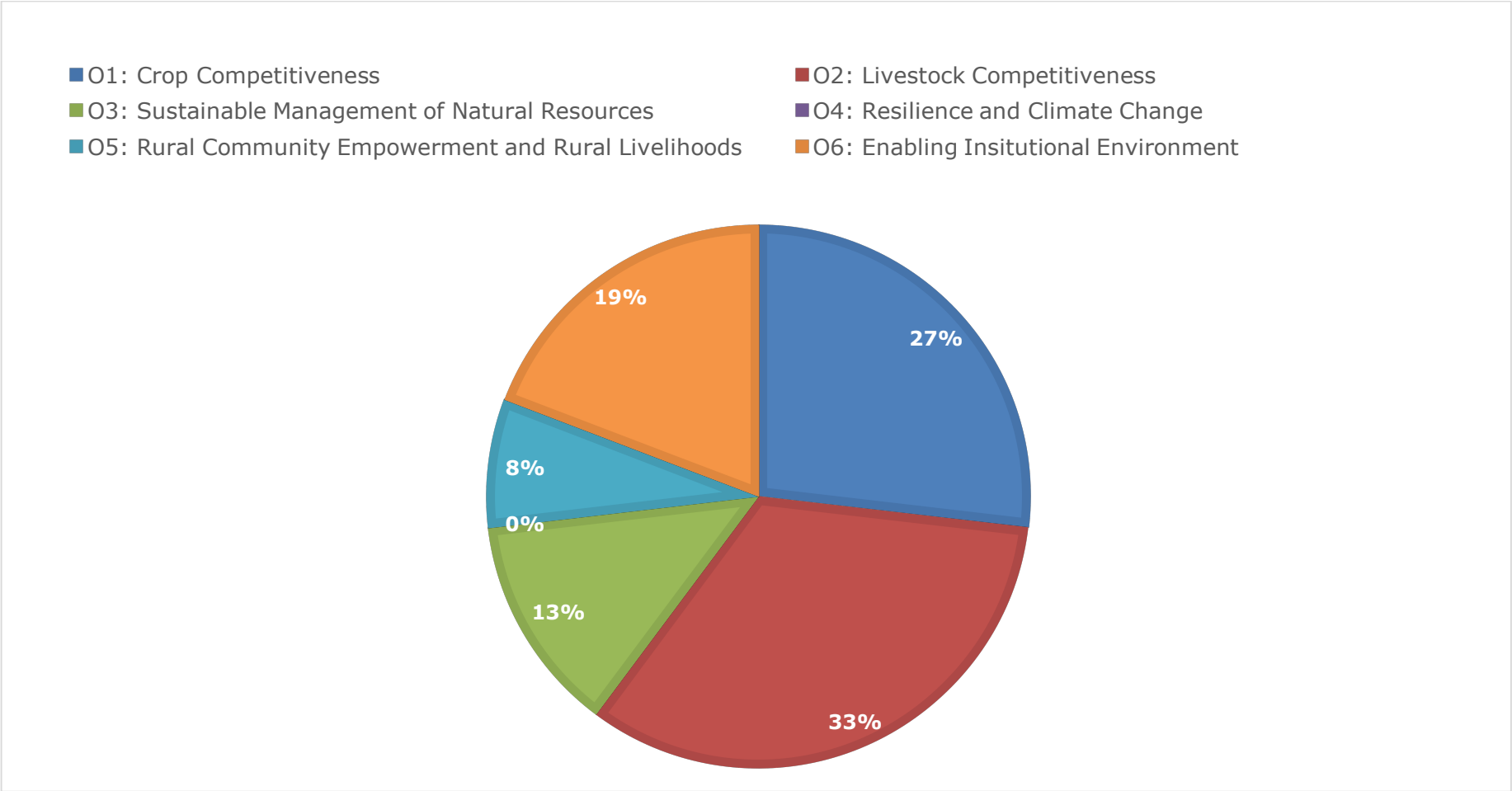
Annex I -MAF Summary Budget (8th FYP and 9th FYP) per intermediate outcome

Intermediate Outcomes	Planned Projects	Allocated	2011	2012	2013	2014	2015	Disbursed	Planned Projects[1a]	Planned Budget[1a]
Outcome 1: Crop sector competitiveness increased	15	32,873,849	368,731	3,527,334	9,150,560	3,206,320	748,732	17,001,677	48	94,050,000
1.1: Technical and organizational innovations promoted, high-value varieties developed, crop yield and nutritional quality improved	14	30,828,144	368,731	2,252,426	8,945,924	3,180,325	748,732	15,496,138	28	53,850,000
1.2: Post-harvest losses reduced, product market quality improved, product value added developed and market opportunities enhanced	1	2,045,705	-	1,274,908	204,636	25,995	-	1,505,539	13	11,650,000
1.3: Stringent biosecurity and food safety measures for crop products enforced	-	-	-	-	-	-	-	-	7	28,550,000
Outcome 2: Livestock sector competitiveness increased	13	18,520,290	2,933,694	860,277	3,621,694	1,030,374	256,951	8,702,990	34	116,938,550
2.1: A more productive, market-oriented and sustainable red meat and dairy industry developed	2	1,623,144	66,163	208,164	436,716	237,343	11,799	960,185	14	47,050,000
2.2: National poultry industry competitiveness and sustainability enhanced	-	-	-	-	-	-	-	-	-	1,250,000
2.3: Apiculture practices and technologies, organization of producers, value addition and marketing enhanced	-	-	-	-	-	-	-	-	4	4,700,000
2.4: Stringent biosecurity and food safety measures for animals and animal products enforced	11	16,897,146	2,867,531	652,113	3,184,978	793,031	245,152	7,742,805	16	63,938,550
Outcome 3: Sustainable management of natural resources in agriculture enhanced	3	11,962,054	267,129	1,871,955	2,288,753	647,650	93,020	5,168,507	13	45,500,000
3.1: Income per unit of water used in agriculture maximized	1	4,619,291	148,897	236,477	1,679,133	477,002	50,585	2,592,094	4	22,500,000
3.2: Capture, re-use and storage capacity of water for agriculture increased	1	1,335,597	41,058	275,709	297,060	167,607	39,235	820,669	2	12,500,000
3.3: Soil management improved	-	-	-	-	-	-	-	-	-	5,500,000
3.4: Agrobiodiversity conserved	-	-	-	-	-	-	-	-	1	5,000,000

Intermediate Outcomes	Planned Projects	Allocated	2011	2012	2013	2014	2015	Disbursed	Planned Projects[\a]	Planned Budget[\a]
Outcome 4: Resilience of agriculture and rural livelihoods to climate change and natural disasters improved	1	2,000,000	-	-	269,822	-	-	269,822	-	-
4.1: Climate change adaptation and natural disaster risk management integrated into agricultural and rural development policy, investment and programmes	1	2,000,000	-	-	269,822	-	-	269,822	-	-
4.2: Climate change mitigation and agricultural carbon footprint improved										-
Outcome 5: Rural communities empowered and rural livelihood opportunities improved	1	1,000,000	348,655	-	-	-	-	348,655	4	26,800,000
5.1: Rural economic activities diversified and livelihood opportunities improved	1	1,000,000	348,655	-	-	-	-	348,655	2	15,800,000
5.2: Local cultural heritage and traditional social values preserved and valued	-	-	-	-	-	-	-	-	4	11,000,000
Outcome 6: An enabling institutional environment for agriculture and rural development strengthened	18	22,052,714	2,484,342	3,349,786	2,257,102	3,302,967	210,212	11,604,409	15	67,292,000
6.1: Institutional and regulatory framework enhanced and enforced	-	-	-	-	-	-	-	-	-	5,817,000
6.2: Economic environment enhanced	1	53,402	53,402	-	-	-	-	53,402	-	-
6.3: Provision of inclusive financial services improved	-	-	-	-	-	-	-	-	-	-
6.4: Knowledge base for SARDS governance strengthened	5	7,151,962	1,554,840	2,170,870	299,727	756,771	9,233	4,791,441	5	8,270,000
6.5: An effective innovation system for a competitive and sustainable agriculture implemented	11	14,763,667	842,193	1,151,821	1,934,694	2,546,196	200,979	6,675,883	10	52,205,000
6.6: Social support to agriculture and rural development enhanced	1	83,683	33,907	27,095	22,681	-	-	83,683	-	1,000,000
TOTAL	51	88,408,907	6,402,551	9,609,352	17,587,931	8,187,311	1,308,915	43,096,060	114	357,580,550

/a: the number of projects planned for the 9th FYP and their respective budget does not take into account that some projects are contributing to more than one intermediate outcome. For a detailed list, see Annex II

Chart: MAF 9th FYP Budget



Annex II – SARDS IP: Public investments (MAF) and PPPs

Outcome 1

Outcome 1. Crop sector competitiveness increased	Number of projects	Budget*
Total 9th FYP (2016-2020)	54 \a	94,050,000
Total PPPs	7	

/a: 45 excluding projects contributing to multiple IOs

1.1: Technical and organizational innovations promoted, high-value varieties developed, crop yield and nutritional quality improved

Impl. Modality	Project name	Number of projects	Budget*
DG Agriculture	Deployment of conventional palm seedling special varieties	1	1,500,000
DG Agriculture	Integrated replacement and renewal date palm villages, *Aflaj*	1	3,500,000
DG Agriculture	Development and deployment of Oman's comparative advantage, crops	1	500,000
DG Agriculture	Extension services to increase date palm productivity	1	1,500,000
DG Research	Research on monitoring and evaluating palm genetic resources	1	800,000
DG Research	Enhancement of date palm tissue culture production	1	4,000,000
DG Research	Tissue propagation and traditional seedlings of improved fruit	1	1,500,000
DG Research	Genetic engineering research to improve crops	1	900,000
DG Research	Testing and production of salt tolerant crops	1	1,000,000
DG Research	Raising tropical and deciduous fruit productivity	1	1,500,000
DG Research	Collecting and propagating pastoral plant seeds tolerant to salinity	1	1,000,000
Agricultural practices on farm pest management			
DG Agriculture	Improvement of agriculture cropping patterns to enter the optimal combination	1	600,000
DG Agriculture	Application of good agricultural practices system - GAP \a	1	500,000
DG Agriculture	Integrated management of pests and other diseases in palm trees \a	1	1,250,000
DG Agriculture	Integrated Pest Management of other fruit trees \a	1	500,000
DG Agriculture	Integrated management of vegetable pests \a	1	450,000
DG Agriculture	Application of organic agriculture for the production of dates	1	1,000,000
DG Agriculture	Integrated Pest Management of coconuts and Alvivaa in Dhofar \a	1	250,000
Extension services and incentives to agriculture			
DG Agriculture	Development and provision of agricultural extension services	1	5,700,000
DG Agriculture	Extension mobile units	1	2,500,000
DG Agriculture	Transfer of modern agricultural techniques	1	15,000,000
DG Agriculture	Introduction of modern methods to improve soil properties	1	1,000,000
DG Agriculture	Development operations of palm service automation	1	1,000,000
DG Research	Hydroponic vegetable and feed production techniques	1	2,000,000
DG Research	Increased yield, pest resistance and adaptability to Oman climate of the most important agricultural crops	1	2,000,000
DG Research	Development and increased productivity of the date palm	1	900,000
Projects not included in the SARDS priorities			
DG Agriculture	Substitute Rhodes grass with wheat cultivation in water deficit areas	1	1,500,000
Total 9th FYP (2016-2020)		**27**	**53,850,000**

\a: the project contributes also to IO 1.3 (the original budget of these projects is distributed accordingly)

Public-Private Partnerships:

PPP	Production of modern nurseries (feasibility needed)	1	
PPP	Commercial fruit farm in Altrechasah (feasibility needed)	1	
Total Public-Private Partnerships		**2**	**-**

1.2: Post-harvest losses reduced, product market quality improved, product value added developed and market opportunities enhanced

Impl. Modality	Project name	Number of projects	Budget*
Post-harvest/processing			
DG Agriculture	Quality control and raising the added value of Omani dates	1	2,000,000
DG Marketing	Creation of sorting, grading, packaging and cooling facilities for farmers in Al Batinah[\a]	1	3,000,000
Agroprocessing			
DG Research	Research on the development and transfer of food processing techniques	1	1,000,000
Marketing			
DG Marketing	Traveling exhibition of agricultural and animal products Oman[\b]	1	450,000
DG Marketing	Adjusting the quality of the economic return of agricultural and animal products[\b]	1	1,050,000
DG Marketing	The complex catalog of Ortab and dates Oman[\c]	1	2,400,000
DG Marketing	Diagnosis of agricultural marketing constraints[\b]	1	400,000
DG Marketing	Agricultural Marketing Information Network[\b]	1	450,000
DG Marketing	Technical and financial support for agricultural associations[\d]	1	900,000
Total 9th FYP (2016-2020)		**9**	**11,650,000**

\a: the project contributes also to IO 2.1. \b: also contributing to IO 2.1 \c: also contributing to IO 1.3 \d: also contributing to 1.3, 2.1 and 2.3 (the budget of these projects is shared accordingly)

Public-Private Partnerships:

PPP	Dates value addition and marketing	1	N/A
PPP	Low quality dates processing	1	N/A
PPP	Low quality dates processing into feed	1	N/A
PPP	Use of palm in timber industry	1	N/A
PPP	Fruit and vegetable marketing company	1	N/A
PPP	Fruit processing (feasibility study needed)	1	
Total Public-Private Partnerships		**6**	**-**

1.3: Stringent biosecurity and food safety measures for crop products enforced

Impl. Modality	Project name	Number of projects	Budget*
DG Agriculture	Requirements of the Locust Control Centre	1	1,500,000
DG Agriculture	Integrated management of the red palm weevil in palm trees	1	2,500,000
DG Agriculture	Integrated management of the dubas bug in date palm	1	8,000,000
DG Agriculture	Integrated management of the Panama banana disease	1	750,000
DG Agriculture	Evaluation of the quality of pesticides, fertilizers and agricultural products	1	2,000,000
DG Agriculture	Increased technical capacity for plant quarantine	1	1,000,000
DG Agriculture	Technical capacity development for quarantine	1	1,500,000
DG Agriculture	Registration and management of pesticides, fertilizers and soil conditioners	1	1,000,000
DG Agriculture	Application of good agricultural practices system - GAP [\a]	1	500,000
DG Agriculture	Integrated management of pests and other diseases in palm trees [\a]	1	1,250,000
DG Agriculture	Integrated Pest Management of other fruit trees [\a]	1	500,000
DG Agriculture	Integrated management of vegetable pests [\a]	1	450,000
DG Agriculture	Integrated Pest Management of coconuts and Alvivaa in Dhofar (original budget OMR0.5m) [\a]	1	250,000
DG Marketing	The complex catalog of Ortab and dates Oman[\b]	1	2,400,000
DG Marketing	Agricultural, livestock marketing outlets (Retail) [\c]	1	750,000
DG Marketing	Technical and financial support for agricultural associations[\d]	1	900,000
DG Research	Research on the safe use of agricultural pesticides	1	1,500,000
DG Research	Research on Integrated Pest Management for dubas bug, RPW and other pests	1	1,800,000
Total 9th FYP (2016-2020)		**18**	**28,550,000**

\a: the project contributes also to IO 1.1. \b: also contributing to IO 1.2 \c: also to 2.1 \d:also contributing to 1.2, 2.1 and 2.3 (the budget of these projects is shared accordingly)

Outcome 2

Outcome 2. Livestock sector competitiveness increased	Number of projects	Budget*
Total 9th FYP (2016-2020)	43[\a]	116,938,550
Total Public-Private Partnership	10	

/a: including double allocations

2.1: A more productive, market-oriented and sustainable red meat and dairy industry developed

Impl. Modality	Project name	Number of projects	Budget*
Rangeland Management			
DG Livestock	Specific rangeland improvement intervention (Dohfar, Jebel Shams, Jebel Al-Akhdar and central provinces)	1	5,500,000
DG Livestock	Country wide interventions improved rangeland management and control of invasive species	1	5,000,000
DG Livestock	Development and management of frankincense (olibanum) trees in Dhofar	1	1,500,000
DG Livestock	Develop pastoreland database	1	2,000,000
DG Livestock	Improve technical staff monitoring and licence issuing capacities	1	1,000,000
Quality and cost-effective animal feed base			
DG Livestock	Quality control of feed	1	2,000,000
DG Research	Alternative animal feed production and supply systems	1	1,800,000
National livestock production systems			
DG Livestock	Improvement of livestock production systems	1	5,000,000
DG Livestock	Enhancement of small and medium livestock project	1	5,000,000
DG Livestock	Provision of livestock extension services and tools	1	3,000,000
DG Livestock	Technical and field support for livestock extension	1	3,000,000
DG Research	Improvement of animal genetic resources	1	2,000,000
DG Research	Enhancement of livestock research stations requirements	1	2,000,000
DG Research	National Livestock Training Centre*	1	TBD
Post-harvest infrastructure (efficient value chains and value addition)			
DG Marketing	Rehabilitation and creation of refrigerated and dry stores[\a]	1	2,500,000
DG Marketing	Agricultural, livestock marketing outlets (retail) [\b]	1	1,500,000
DG Marketing	Creation of sorting, grading, packaging and cooling facilities for farmers in Al Batinah [\b]	1	3,000,000
DG Marketing	Traveling exhibition of agricultural and animal products Oman [\b]	1	450,000
DG Marketing	Adjusting the quality of the economic return of agricultural and animal products [\b]	1	1,050,000
DG Marketing	Diagnosis of agricultural marketing constraints [\b]	1	400,000
DG Marketing	Agricultural Marketing Information Network [\b]	1	450,000
DG Marketing	Technical and financial support for agricultural associations [\c]	1	900,000
Total 9th FYP (2016-2020)		**21**	**47,050,000**

\a: also contributing to IO 2.2 \b: also contributing to IO 1.2 \c: also contributing to 1.3, 1.2, 2.3 (the budget of these projects is shared accordingly)

*: This project (estimated to cost around 5 million OMR) was not originally included in the 9th FYP budget.

Impl. Modality	Project name	Number of projects	Budget*
PPP	Collection, processing of milk and marketing of dairy products in Dhofar	1	N/A
PPP	Local small and large ruminants production and marketing (feasibility study to be conducted)	1	N/A
PPP	Production of dry and green fodder abroad	1	N/A
PPP	Production, processing and marketing of cow milk (OFIC)	1	N/A
PPP	Project production of red meat in Tanzania (OFIC)	1	N/A
PPP	Project production of red meat in Dhofar (OFIC)	1	N/A
Total Public-Private Partnership		**6**	**N/A**

2.2: National poultry industry competitiveness and sustainability enhanced

Impl. Modality	Project name	Number of projects	Budget*
Gov. funded	Formulate a project that enables the creation of a poultry expert council and its operation, as well as the establishment of financial incentives to poultry model farms (and possibly well performing farms in general). If a new project is not possible, one project under IO 2.1 could be widened in scope to cover this priority.	0	0
DG Marketing	Rehabilitation and creation of refrigerated and dry stores	1	1,250,000
Total 9th FYP (2016-2020)		**1**	**1,250,000**

Impl. Modality	Project name	Number of projects	Budget*
PPP	Production and marketing of poultry meat (OFIC)	1	N/A
PPP	Poultry parent stock production (OFIC)	1	N/A
PPP	Fertilized egg production (feasibility study to be conducted)	1	N/A
PPP	Table egg production (feasibility study to be conducted)	1	N/A
Total Public-Private Partnership		**4**	**N/A**

2.3: Apiculture practices and technologies, organization of producers, value addition and marketing enhanced

Impl. Modality	Project name	Number of projects	Budget*
DG Agriculture	Development of the economics of education and propagation of honey bees	1	1,500,000
DG Research	Research on genetic improvement of Omani bee strains	1	500,000
DG Marketing	Marketing identity and improved methods of packing the Omani honey	1	1,800,000
DG Marketing	Technical and financial support for agricultural associations[\a]	1	900,000
Total 9th FYP (2016-2020)		**4**	**4,700,000**

\a: also contributing to 1.3, 1.2, 2.1 (the budget of these projects is shared accordingly)

2.4: Stringent biosecurity and food safety measures for animal products and animal source foods enforced

Impl. Modality	Project name	Number of projects	Budget*
DG Livestock	Requirements of Sa'al central diagnostic lab	1	2,477,800
DG Livestock	Integrated control of internal and external parasites	1	4,000,000
DG Livestock	National project to immunize livestock	1	9,500,000
DG Livestock	Brucellosis and Johne's disease control	1	8,000,000
DG Livestock	Mobile veterinary clinics	1	2,000,000
DG Livestock	Medical supplies for veterinary clinics	1	10,980,000
DG Livestock	Veterinary Hospital in Salalah	1	3,761,750
DG Research	Monitoring of livestock zoonotic diseases	1	1,500,000
DG Livestock	Early warning unit of transboundary diseases	1	2,474,000
DG Livestock	Establishment of Al Duqum veterinary quarantine	1	2,000,000
DG Livestock	Establishment of Alraba Alkhaly veterinary quarantine	1	2,000,000
DG Livestock	Establishment of Khasab veterinary quarantine	1	2,000,000
DG Livestock	Establishment of al Buraymi veterinary quarantine	1	2,000,000
DG Livestock	Establishment of Shenas veterinary quarantine	1	2,000,000
DG Livestock	Rehabilitation of quarantine centre*	1	TBD
DG Livestock	Updating the systems supervision in veterinary quarantines	1	3,075,000
DG Livestock	Establishment of 6 veterinary diagnostic units	1	3,670,000
DG Planning	Establishment of agricultural and veterinary offices	1	2,500,000
Total 9th FYP (2016-2020)		**17**	**63,938,550**

*: This project (estimated to cost around 5 million OMR) was not originally included in the 9th FYP budget.

Outcome 3

Outcome 3. Sustainable management of natural resources in agriculture enhanced	Number of projects	Budget*
Total 9th FYP (2016-2020)	11	45,500,000

3.1: Income per unit of water used in agriculture maximized

Impl. Modality	Project name	Number of projects	Budget*
DG Agriculture	Introduction of modern irrigation systems in Omani farms	1	18,000,000
DG Research	Classifying saline land using modern techniques	1	1,000,000
DG Research	Sustainable Irrigation water management research	1	1,000,000
DG Research	Agricultural research requirements	1	2,500,000
Total 9th FYP (2016-2020)		**4**	**22,500,000**

3.2: Capture, reuse and storage capacity of water for agriculture increased

Impl. Modality	Project name	Number of projects	Budget*
DG Agriculture	Transfer of methods and techniques on treated wastewater	1	2,500,000
DG Research	Use of treated water to reduce the effects of salinity	1	10,000,000
Total 9th FYP (2016-2020)		**2**	**12,500,000**

3.3: Soil management improved

Impl. Modality	Project name	Number of projects	Budget*
DG Research	Model farms for biosaline technology transfer	1	3,000,000
DG Agriculture	Cultivation and dissemination of saline-tolerant crops	1	500,000
DG Agriculture	Introduction of desalination units on farms affected by salinity	1	2,000,000
Total 9th FYP (2016-2020)		**3**	**5,500,000**

3.4: Agro-biodiversity conserved

Impl. Modality	Project name	Number of projects	Budget*
DG Research	Management of plants and animals genetic banks	1	1,000,000
DG Research	Eradication of maritime Ghaf tree (mesquite)	1	4,000,000
Total 9th FYP (2016-2020)		**2**	**5,000,000**

Outcome 4

Outcome 4. Resilience of agriculture and rural livelihoods to climate change and natural disasters improved	Number of projects	Budget*
Total 9th FYP (2016-2020)	0	0

4.1: Climate change adaptation and natural disaster risk management integrated into agricultural and rural development policy, investment and programmes

Impl. Modality	Project name	Number of projects	Budget*
MAF	Establish the functions of a focal point on climate change adaptation and mitigation (shared with IO 4.2); Study climate change-related risks and practicable solutions (including infrastructure design); and Participate in policy dialogue for national planning on climate change adaptation and disaster risk reduction (IO 6.1).		
Total 9th FYP (2016-2020)		**0**	**-**

4.2: Climate change mitigation and agricultural carbon footprint improved

Impl. Modality	Project name	Number of projects	Budget*
TBD	Establish the functions of a focal point on climate change adaptation and mitigation (shared with IO 4.1); Participate in policy dialogue for national planning on climate change mitigation (IO 6.1); and Include climate change adaptation and mitigation throughout its awareness campaigns (IO 6.6).		
Total 9th FYP (2016-2020)		**0**	**-**

Outcome 5

Outcome 5. Rural communities empowered and rural livelihood opportunities improved	Number of projects	Budget*
Total 9th FYP (2016-2020)	7	26,800,000

* The number of private projects is based on the number of permissions asked to the MAF, independent of their feasibility The budget for private investments under each IO only includes the figures that were available and is therefore highly underestimated. The budget for private investment of the whole outcome is an estimate considering average investments for those projects without a disclosed budget.

5.1: Rural economic activities diversified and livelihood opportunities improved

Impl. Modality	Project name	Number of projects	Budget*
Govt funded	Preparatory study on the identities of rural areas in Oman		
Govt. funded	Study on social marginalization in rural areas: causes and associated risks		
Govt. funded	Participatory design of initiatives for social inclusion of vulnerable groups		
DG Agriculture	Establishment and development of small and medium enterprises projects	1	1,000,000
DG Agriculture	Improving the efficiency of irrigation water in mountainous agricultural areas	1	1,000,000
DG Agriculture	Pilot project on family-oriented agriculture	1	1,000,000
DG Agriculture	Agricultural pest control for fruit trees in mountain areas	1	800,000
DG Agriculture	Construction of walls to protect agricultural land	1	12,000,000
	Participatory analysis of the Jebel Akhdar context		
	Pilot rural development programme in Jebel Akhdar		
Total 9th FYP (2016-2020)		**5**	**15,800,000**

5.2: Local cultural heritage and traditional social values preserved and valued

Impl. Modality	Project name	Number of projects	Budget*
DG Agriculture	On-field irrigation water management for date palm *(Aflaj)*	1	1,000,000
DG Agriculture	Development of traditional farming systems villages *(Aflaj)*	1	10,000,000
	Identification of specific cultural heritage assets		
	Participatory design of potential initiatives for valorisation of local cultural heritage and social values		
Total 9th FYP (2016-2020)		**2**	**11,000,000**

Outcome 6

Outcome 6. Enabling institutional environment for agriculture and rural development strengthened	Number of projects	Budget*
Total 9th FYP (2016-2020)	15	67,292,000

6.1: Institutional and regulatory framework enhanced and enforced and 6.2:Economic environment enhanced

Impl. Modality	Project name	Number of projects	Budget*
DG Planning	Consultancy studies and technical consultants to support the Ministry device	1	2,850,000
DG Planning	Socio-economic assessment of agricultural and fishery projects	1	487,000
DG Planning	Design and development of e-government applications	1	2,480,000
	Workshops and material for policy dialogue (targeting private and public stakeholders)		
	Technical assistance to reform the subsidies / incentives system within MAF		
Gov. funded	Project required for studies on labour and land use; needs coordination with the budget already allocated for studies in Outcome 6		
Total 9th FYP (2016-2020)		**3**	**8,817,000**

6.3: Provision of inclusive financial services improved

Impl. Modality	Project name	Number of projects	Budget*
	Study to identify the most appropriate financial products		
	Technical assistance to financial institutions to enhance the capacities to identify market and credit opportunities		
Total 9th FYP (2016-2020)		**0**	**-**

6.4: Knowledge base for agriculture and rural development strengthened

Impl. Modality	Project name	Number of projects	Budget*
DG Planning	Updating of agricultural annual statistical data	1	1,000,000
DG Planning	Support to surveys to calculate the GDP of the agriculture and fisheries sector	1	900,000
DG Planning	Agricultural and Fisheries Information Centre	1	1,000,000
DG Planning	Establishment of a geographical information unit – including the use of geo-referenced data and satellite imagery	1	2,000,000
DG Planning	Information, network and communication security networks and communications	1	2,560,000
DG Planning	Information and communication networks and security	1	810,000
Total 9th FYP (2016-2020)		**6**	**8,270,000**

6.5:An effective innovation system for a competitive and sustainable agriculture implemented

Impl. Modality	Project name	Number of projects	Budget*
DG Planning	Development projects to support investment activity for Oman Food Investment Holding (OFIC)	1	3,000,000
	Technical assistance and studies to integrate all extension interventions into a system of smart subsidies and comprehensive innovation system		
DG Planning	Maintenance of ministry facilities and buildings and replacement of furniture	1	4,300,000
DG Planning	Reconstruction of old ministry buildings	1	17,750,000
DG Planning	Construction and completion of infrastructure for the development of the agriculture and fisheries sectors	1	22,300,000
DG Planning	Training and qualifying Omani cadres	1	4,855,000
	Establish a knowledge management and learning platform		

Total 9th FYP (2016-2020)	**5**	**52,205,000**

6.6: Enhancing social support to agriculture and rural development

Impl. Modality	Project name	Number of projects	Budget*
DG Planning	Development of the means of communication and extension services development (media) Carry out awareness raising campaigns on strategic topics	1	1,000,000
Total 9th FYP (2016-2020)		**1**	**1,000,000**

Annex III – Summary of institutions relevant to IP implementation

The table below summarizes how the IP proposes that the Government of Oman acts on these private sector enablers. The summary reinforces the idea that the competitiveness of the agriculture and rural sector in the Sultanate of Oman does not depend solely on the actions directly taken by the MAF, but requires the coordinated intervention of a plethora of national institutions.

Enabler	How the IP seeks to enable the private sector	Intervening institutions*
***Development of primary producers*:**		
Trade policy	- Oman is a member of the World Trade Organization (WTO) and already has free trade policies in place; however, the SARDS IP envisions the improvement of biosecurity and food safety regulation and enforcement in accordance with the sanitary and phytosanitary measures (STS) agreements of the WTO (e.g. OIE and IPPC standards), as to protect the country against pests and diseases and domestic producers against unfair competition from non-compliant imports. - The SARDS 2040 also proposes a clarification of the mechanism for domestic price cap setting as it might shy investors away from producing differentiated products (e.g., organic, high-value dates varieties) at a higher sales price.	MOCI PACP (MAF has a convening role)
Infrastructure	- Infrastructure is generally not a problem and it has been continuously improving. The IP focuses on the need to guarantee that the necessary infrastructure (public or private) exists for biosecurity control as this acts as a natural selection of producers (those that are compliant stay in the industry) and results in a more efficient use of natural resources.	MOCI MAF
Land tenure and property rights	- The SARDS IP includes as one of its priorities a land use plan to be designed together with the relevant institutions and in consultation with civil society. It also recommends that a rezoning of farmland (in line with the *Oman Salinity Strategy*) is considered. This can accelerate the licensing of investment at farm level and result in greater farm productivity.	MRMWR MOHO MAF CSOs
Standards and regulations	- The SARDS IP places a large emphasis on the priority that the mechanisms to incentivize the adoption of GAP and the enforcement of biosecurity measures represent. Adjustments on the labour regulation can also bring about important competitiveness gains. The RAI should be taken into account for large investments.	MAF MoM CSOs
Financial services	- Financial services for the agriculture and rural sector in Oman can still be improved. The SARDS IP envisions studies and pilots to promote credit and insurance products. Initially subsidized insurance plans might also be necessary.	MAF, ODB, SQU, AFDF, CMA, private financial institutions, CSOs
Research and development	- The SARDS IP calls for support for research and development (R&D) on varieties with high market acceptance, value and water efficiency (tolerance to salinity might also be adequate for some regions). It also calls for the reinforcement of the AIS as a whole (demonstration farms under a new model, development of institutional capacities, partnership with experts external to the MAF, research interacting with the private sector such as farmers and agro-industry) for demand and results assessment, etc.	MAF, TRC, AFDF, MAF, SQU, Riyada, large projects (e.g., *One Million Date Palms*)
Producer organizations	- The SARDS IP recognizes the importance of producer organizations in helping overcome constraints for farmers related to access to knowledge, markets and finance or capacity to manage risk. Thus it includes the reform of the law on associations as a priority.	MSD, CSOs (MAF has a convening role)
Business linkages and business	- Although Christy et al (2009) identifies business linkages and business development services just as useful enablers, the IP gives a high priority to these, given that many other enablers in the country are already somehow in place. The establishment of	MAF Riyada CSOs OCCI

Enabler	How the IP seeks to enable the private sector	Intervening institutions*
development services	private technical assistance for farmers (from associations or consultancies) is seen as essential. Equally essential is establishing the linkages between farmers and agribusiness or premium market outlets (by matching supply and demand in terms of quality and post-harvest management) as well as farmer financial services. In the case of livestock production, efficient high-quality feed provision services are essential.	
Other (subsidies)	- The SARDS IP foresees a restructuring of projects related to subsidies, including IPM-related projects, improving beneficiary selection and introducing (WTO-compliant) conditionality mechanisms, aiming for more stable/predictable disbursement streams and a lower expenditure on subsidies, thus leaving investment resources for priority interventions.	MAF MOF
Development of Agro-industry:		
Trade policy	- Same as for farmers. The setting of domestic prices can be even more problematic for agro-industries, as they aim to add value to agricultural products and this needs to be reflected in higher prices. Without certainty of freedom to establish prices, investors might see the sector as being too risky.	MOCI PACP (MAF has a convening role)
Infrastructure	- This is generally not a problem and it has been continuously improving (e.g., plans to expand ports and railway system). However, infrastructure to ensure food security control (laboratories) needs to be guaranteed.	MRMWR MOCI MAF
Land tenure and property rights	- As for farmers, land use planning is essential for agro-industries to accelerate the licensing of investments. The inclusion of agri-business on the existing *InvestEasy* or *Omuna* systems and the establishment of a one-stop shop for information and licensing are important steps to facilitate the growth of the private sector.	MRMWR MOHO MAF OCCI
Standards and regulations	- Key for the development of the industry is the enforcement of food safety regulations at least in line with the following *Codex Alimentarius* (including for imports, which cannot constitute unfair competition for domestic products with higher standards) and a traceability system. The SARDS IP also envisions that the public sector can support and promote adoption of voluntary quality standards (GAP, HACCP, ISO, etc.) to differentiate and add value to national products. Adjustments on the labour regulation can also bring about important competitiveness gains in some industries (e.g., slaughterhouses that require a considerable number of workers).	MRMWR Riyada MOCI MOM
Financial services	- Generally there is a low number of agribusinesses in the Sultanate of Oman. When designing and piloting new financial products as established in the SARDS IP, it is important that not only farms are considered, but also agricultural products processing units (slaughterhouses, animal and vegetable products processing, sorting, grading and refrigeration facilities, etc.).	MAF, ODB, SQU, AFDF, Private financial institutions, OCCI
Research and development	- The SARDS IP envisions expenditure in R&D (in partnership with agrobusinesses) for improved post-harvest care, labelling, branding or other marketing-related activities (e.g., market intelligence). The establishment of technical councils (independently or within the MAF) for the assessment of business proposals, support to the establishment of quality inspection units and technical support to entrepreneurs can also assist in the transformation of the sector towards a modern, resource efficient sector producing high value-added products.	MAF TRC AFDF SQU Riyada PPPs
Producer organizations	- The SARDS IP recognizes the need for the constitution of cooperative enterprises along the value chains. Particular emphasis is given to the need to constitute and empower producer organizations for the production (feed lots, breeding), marketing (collection schemes) and processing of livestock products. This will require not only amendments to the law on	Riyada Al Raffd Fund AFDF MAF Private consultancies

Enabler	How the IP seeks to enable the private sector	Intervening institutions*
	associations, but facilitating partnerships with groups of farmers and institutions with capacity to incubate businesses.	
Business linkages and business development services	- As the country is still fairly inexperienced in the establishment of agribusinesses, the public sector should support it not only with the tools described above (credit, R&D, etc.), but also with business incubator activities. International consultancies, domestic partners (e.g., Riyada) and ad hoc technical councils can provide support to new businesses, while mature private business support services do not exist. The public sector can also provide awareness campaigns and market intelligence-related services. Export promotion is also often a mission shared between the public and private sector.	Riyada PAIPED/Ithraa Al Raffd Fund AFDF MAF private consultancies
Other (PPPs)	- In this case, the SARDS IP proposes that PPPs are first movers in mediating production supply and demand. Some priorities for private investments with public participation are the production of animal feed from residues (but possibly also from imported material), dairy plants and slaughterhouses where there is a high concentration of livestock, or cooling, sorting, grading and packaging facilities in key fruit and vegetable production areas.	MAF MOHO MRMWR MOCI Riyada

* The list of institutions in this column is indicative and not exhaustive of all relevant stakeholders.