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## **Role of Small and Medium Enterprises and Agricultural Cooperatives in Promoting Sustainable Agriculture for Rural Development and Food Security**

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### **Abstract**

The agricultural sector in Oman plays a major developmental and a socio-economic role in the sustainability of rural communities. There have been efforts by various governmental authorities aimed at supporting and developing the agricultural sector to achieve sustainable and long term contributions to the national gross domestic product (GDP). Sustainability of the agricultural sector in Oman will guarantee its contribution to food security as well the creation of employment, alleviation of poverty, and improvement of the living standards of the rural communities which, in turn, are parts of the country's strategic plans. This study investigates the possibilities of developing Agricultural Small and Medium Enterprises (SMEs) and Cooperatives as contributors to the sustainability of the agricultural sector, rural development, and food security mainly in rural villages in the Sultanate of Oman. The study recognizes the probable advantages linked with promotion of agricultural SMEs and the distinguishing ties to the sustainability of the agricultural sector and the rural development, which in turn will promote the food security. Benefits of developing agricultural SMEs may include boosting the farmers' competence by upgrading their skills through training, networking, and accessing information. Farmers will achieve economic viability through the attainment of 'economies of scale', 'economies of scope', and 'cost-efficiency'. There are benefits that will be gained by the consumers through improving quality and standards. Sustainability of the environment is a major outcome as best practices will lead to the control and the management of natural resources and the control of chemicals used in production. The farmer and society living standards at village level will benefit due to economic gains that are achieved. A qualitative research method is adopted by this study in conjunction with a 'triangulation' method by encompassing literature review, field investigation, face-to-face and focus group interviews with key stakeholder groups, and case studies to offer credible insights into the current state of affairs in the sector. Keeping the strategic importance of agricultural sustainability in mind,

the development and promotion of SMEs and cooperatives have the potential to function as possible strategic tools in realizing the socio-economic potential of the agricultural sector. Both primary and secondary stakeholders' views hinted at this critical point.

**Keywords:** Sustainable Agriculture, Rural Development, SMEs, Agricultural Cooperatives, Oman

**JEL Classification:** Q19, Q13

**Paper Classification:** Research Paper

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## Introduction

It is acknowledged that the agricultural sector in the Sultanate of Oman plays a vital socio-economic role in the country's sustainable development drive (MNE, 2007a). Under the economic diversification policies and, in line with regional and global initiatives and policy agendas with regard to agricultural sustainability, the Sultanate of Oman has devoted particular attention to the development of the agricultural sector as a mechanism to increase the sector's contribution to Gross Domestic Product (GDP), create employment opportunities for Omanis, improve food security, sustain socially cohesive rural communities and community welfare, amongst others. Substantial efforts have been directed by government agencies to ensure the sustainable use of agricultural resources, to improve economic efficiency, and to maximize socio-economic benefits from the sector (MNE, 2007b). Despite these efforts the sector is facing challenges at various levels (i.e. field, farm and country levels) (MAF, 2007; MAF, 2009).

To promote a sustainable agriculture for rural development and food security, the development of Agricultural Small and Medium Enterprises (SMEs) has been recently encouraged (Oman Observer, 2013). SMEs are expected to create production linkages, promote trade, create job opportunities and generate important sources of income, etc. (Hertog, 2010). Whereas, it can be argued on the other hand that agricultural cooperatives have the potential to improve efficiency, reduce transaction costs, facilitate access of small-scale farmers to markets, improve income opportunities and empower farmers to improve their quality of life, amongst others (Polat, 2010). Bearing these recent development initiatives in mind, the key focus of the present study will be on the traditional agricultural farming system (i.e. agricultural farming that relies upon the falaj water distribution system<sup>1</sup>). The study has the following objectives to: 1) examine the current status, challenges, opportunities and gaps that remain in the role of SMEs and Agricultural Cooperatives to promote sustainable agriculture for food security and rural development; 2) identify primary stakeholder views on the key issues associated with the advancement of SMEs and Agricultural Cooperatives initiatives; and 3) suggest appropriate strategic options in line with the findings of this study.

## A Conceptual Note

Since 1987, the concept of sustainable development has become a catchphrase for international, regional, and national programs and corresponding policy undertakings in all sectors. For instance, the World Commission on Environment and Development (WECD) stated that:

*"Humanity has the ability to make development sustainable - to ensure that it meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply limits – not absolute limits but limitations imposed by the*

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<sup>1</sup>The falaj system is the traditional method developed centuries ago for supplying water for irrigation and domestic uses.

*present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities” (WCED, 1987, 15).*

The concept of sustainable development is multi-dimensional and temporal in nature. It embraces four major interrelated dimensions: ecological, economic, social and institutional sustainability (Charles, 2001). This particular definition was embraced by the Sultanate of Oman in its reporting of national economic performance.

In the context of agriculture and rural development, the persuasion of the concept of sustainable development is echoed by the emergence of the Sustainable Agriculture and Rural Development (SARD) concept of the early 1990s. Enhancement of agricultural food production in a sustainable manner and attainment of food security have been important objectives of SARD. The concerted efforts to promote sustainable agriculture and rural development have led to the development and adoption of Agenda 21 – the action plan adopted by 169 countries at the 1992 United Conference on Environment and Development (UNCED). Chapter 14 of ‘Agenda 21’ is devoted to the active promotion of sustainable agriculture and rural development (UN, 1992).

Agriculture and rural development have long been considered the essence of socio-economic development in many developing and developed countries in the world, and of course Oman is no exception. Furthermore, agriculture is assuming an increasingly vital role in achieving food security efforts and rural poverty reduction (WB, 2011). In a recent report entitled, “The State of Food and Agriculture 2013: Food systems for better nutrition by the Food and Agriculture Organization of the United Nations (FAO, 2013), the vital role of agriculture and the entire food chain in eradicating malnutrition is highlighted.

To facilitate conditions that harness the potential of agriculture and maintain or enhance the flow of socio-economic benefits to the community in the future, the discernible hand of the state in the provision of public goods, facilitating investment climate, and regulating natural resource management is required (WB, 2008). Giovannucci et al. (2012) reported that despite considerable awareness about sustainable development the conventional business-as-usual agriculture model remains the dominant paradigm. Rosegrant et al. (2007) reported that to meet the projected global demand in cereal and meat, the production will have to increase by 50% and 85% respectively from 2000 to 2030. If agriculture has to meet this demand it will require sound policy and sustained investments; not business-as-usual. Based on the findings from history, theory and existing empirical studies, government involvement in agriculture seems to be a necessary condition to agricultural development, productivity growth, and economic progress (Bezemer and Headey, 2008). In the context of developing countries, government involvement along with appropriate sets of policies in support of the agricultural sector is essential for resolving issues such as under-investment from private sector relative to social optimum, market failure (e.g. market distortions due to information asymmetry between actors involved in the supply chain), labour market distortions and income volatility amongst others (Bezemer and Headey, 2008). Considering the scope of the present study and call for actions from the international community with regard to agricultural sustainability and rural development, it is important to review the current situation of agricultural development from a national perspective.

## **Socio-economic profile of the agricultural sector in Oman**

The Ministry of Agriculture and Fisheries (MAF) is the responsible authority for the management of the agriculture and fisheries sector in Oman. Based on key parameters such as water requirements for crop, land and water resources potential and cropping patterns, Oman

is divided into two agro-climatic zones namely the northern zone (Batinah coast plain, interior Oman and Dahira plains, Jabel Akhdar and Sharqiyah plains) and the southern zone (Salalah plains, Dhofar Jebel and Nejd). The size of the cultivated area is about 73,670 hectares out of 2.3 million hectares of arable land (Al-Bakri, 2011). In terms of the employment, the sector is most important for Oman as the agricultural population represents 28.5% of the total economically active population in 2010 (FAO, 2011). The agricultural sector budget for the plan period (2011-2015) was RO 50 million<sup>2</sup> (involving 32 projects) and in addition there was a transfer of RO 30.3 million from the 7th Five-year Plan (I. Al-Numani, pers. comm., 12 June 2013). Three specific projects named with budget allocations during the plan period under the Agriculture sector were namely a) integrated management of date palm trees pests at a cost of RO 8.4 million, b) the national project for immunization of animal wealth at a cost of RO 4.4 million, and c) the national strategy for date palm trees at a cost of RO 3.2 million.

### A brief discussion on key issues and challenges

It was forecasted that the population of Oman would grow at a rate of 3.2% over the period 2011-2015 (Alpen Capital, 2011). Due to rise in income and the expected population growth, food consumption was forecasted to grow by 5.3% during the same period (Alpen Capital, 2011). The 2008 estimate of self-sufficiency ratios for grain, red meat, chicken meat, vegetables, eggs, milk, and fruits was 0.8%, 12.6%, 23.9%, 50.9%, 52.0%, 57.9%, and 70.6% respectively (Al-Alawi, 2010). Managing domestic demand remains thus a challenge to Oman. Food imports are projected to grow from RO 809 million in 2010 to RO 1.85 billion by 2020 (Economist Intelligence Unit, 2010).

Considering these issues and challenges, it can be argued that the agricultural development goals in general and the achievement of food security in particular stipulated in the 7th (2006-2010) and 8th Five-Year (2011-2015) Plans are conditioned by effectively addressing a number of challenges and obstacles faced by the agricultural and livestock sectors. The key challenges (albeit interlinked) can be broadly categorized under various operational dimensions of sustainable development (economic, social, environmental and institutional) which are listed in the following Table 1.

**Table 1: Description of key challenges facing the sector**

Dimension	Type of Challenge
Economic	<ul style="list-style-type: none"> <li>• Fragmentation of land</li> <li>• Absenteeism of farmland owners and leasing of farms</li> <li>• Decreasing trend in agriculture land</li> <li>• Economic inefficiency in the overall supply chain</li> <li>• Lack of integrated marketing approach</li> <li>• Lack of promotion of marketing role in agricultural resource conservation and sustainability</li> <li>• Low labour productivity</li> <li>• Increasing income and enhancing living standards of rural households</li> <li>• Large number of expatriate labor force</li> <li>• Creation of jobs for Omani citizens in all agricultural areas</li> <li>• Lack of technological development</li> <li>• Dominance of traditional methods and techniques in irrigation and agricultural operations</li> </ul>
Institutional	<ul style="list-style-type: none"> <li>• Weakness in regulatory and legal framework</li> <li>• Unsupportive policy environment</li> <li>• Inadequate research and development initiatives</li> <li>• Inadequate government support and limited financing</li> <li>• Low private sector investment</li> </ul>

<sup>2</sup> 1 RO ≈ 2.6 USD

Social	<ul style="list-style-type: none"> <li>• Lack of knowledge and network</li> <li>• Lack of education and skills</li> <li>• Change in attitudes and values</li> <li>• Urban migration</li> <li>• Concern with equity and participation</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Soil salination</li> <li>• Soil characteristics</li> <li>• Adaptability to climate change</li> <li>• Waterlogging and massive withdrawal of groundwater</li> <li>• Overuse of fertilizer and pesticides</li> </ul>

Source: Authors' compilation from various sources: MNE (2007a, 2007b), MAF (2007), MAF (2009), MAF (2012), Kotilaine (2010), Hutton (2003), Omezzine and Zaibet (1998), Al-Alawi (2010), field observations and interviews.

## Development of SMEs and Agricultural Cooperatives: A National Perspective

### Definition of SMEs

There is no universally agreed definition of SMEs. In general, SMEs are categorized using total revenue, total assets or the number of employees as indicators. Recently, the Ministry of Commerce and Industry (MoCI) has revised the definition of SMEs in Oman, in an effort to improve the flow of credit and provide more efficient training and guidance to SMEs. It also includes a category for micro-sized enterprises. The new definition is based on two criteria, employment and annual sales turnover of businesses (Table 2). In the previous definition, the number of employees was the only criteria used to define a company as a small or medium enterprise.

**Table 2: Category and criteria of SMEs**

Category	Employment (No. of Workers)	Annual sales (RO)
Micro-enterprise	Up to 5	25,000
Small	5-9	25,000-250,000
Medium	10-99	250,000-1.5 million

Source: MoCI, Circular No. 1/2012.

The 8th Five-Year Plan of Oman aims to intensify efforts related to the development of SMEs by developing the financial sector to ensure provision of profitable investment opportunities, financing the private sector, and continuance of improvement of the investment environment.

### Challenges facing the SME Sector

The MoCI has identified some key barriers to the development of SMEs in Oman: access to finance, marketing, human resources, appropriate training, lack of infrastructure, SME linkage to industry, SMEs cluster, national and sector specific strategy development, and bureaucracy. To overcome these barriers, the agency has developed some strategies to provide assistance to prospective SMEs in relation to business management and development and the management of finance. In a recent article, in Oman Economic Review (OER, 2012), it is indicated that the development efforts with regard to SMEs met with some obstacles as follows: a) administrative difficulty to include young Omanis in the businesses; b) lack of clear information c) lack of a clear policy framework for an entrepreneurship culture in the 8th Five-Year Plan, d) inefficiency in marketing of products, e) small size of the local market and unsupportive consumers attitudes,

f) lack of experience and skills, g) non-compliance with the system in some cases, h) lack of accountability of service providers, i) lack of manpower and difficulties in obtaining authority permission for their required numbers, j) lack of entrepreneur education, k) presence of expatriate entrepreneurs (60% of the expatriate population) in current business as 'sleeping partners', amongst others.

## Agricultural Cooperatives

The concept of agricultural cooperative is not new to the country. A number of initiatives took place in the early 1970s to encourage the development of agricultural cooperatives in the Sultanate. There were twenty agricultural cooperatives and one consumer cooperative between 1976 and 1979. However, it is claimed that institutional, financial and human resources related limitations halted the initial growth of the agricultural cooperatives in Oman (I. Al-Numani, pers. comm., 12 June 2013).

An interview with the Ministry of Social Development (MSD) representatives revealed that the initiative for the development of agricultural cooperatives will receive reconsideration and is awaiting government approval. The importance of cooperatives with particular reference to the agricultural sector is felt by the respondents from various institutions such as MSD, MAF, and Supreme Council for Planning. The underlying reasons - as expressed by the respondents - included enhancement of efficiency, minimization of risk and elevation of competitiveness along the overall supply chain.

## Farmer's Association

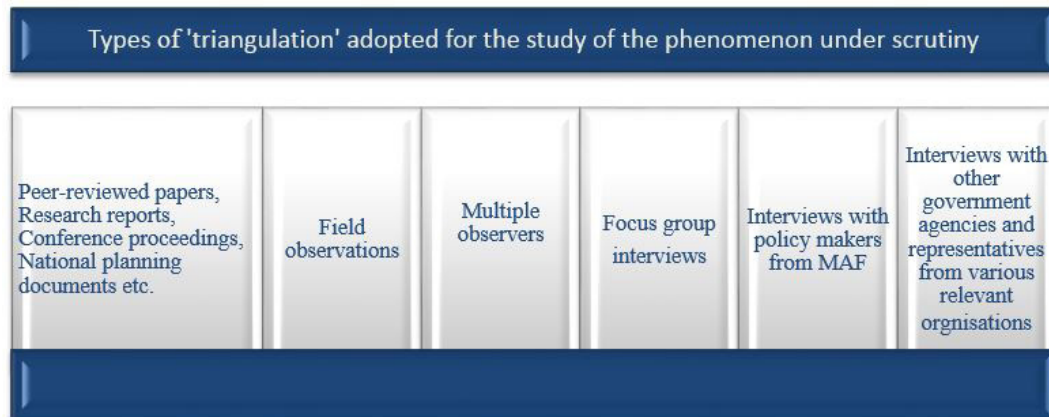
In order to address some of the key challenges faced by the sector, farmers located in Al-Batinah Governorate have adopted a collective action management approach and formed the Batinah Farmers' Association in 2005 which received legal recognition in 2009 (Sheikh S. Al-Kharusi, pers. comm., 24 June 2013). Participation in the Association is voluntary. In 2013, it had 68 members and the membership fees were RO 100, RO 200, and RO 300 for small, medium and large size farms respectively to cover administrative costs. It provides various services such as access to market information and markets, access to expert advice etc. to its members and its members enjoy the following important benefits: a) improved farm output b) increased income c) access to farm inputs d) access to credit from banks e) capacity development training f) marketing assistance g) access to market information.

The challenges are addressed through: a) active engagement with relevant government agencies, b) adoption of new technology, c) provision of essential and relevant information to farmers, d) creation of networks with experts, e) promotion of efficiency in water-use by adopting modern irrigation, f) protection of environment and production of safe product through the use of environmentally friendly pesticide, g) adoption of a crop diversification strategy, h) reduction of production costs using collective market power, i) promotion of greenhouse and soilless agriculture, and j) provision of market information and searching for economically viable market for farmer members etc. Since the establishment of the Association, some of the notable achievements: a) the association started with 24 members in 2007, increased to 40 in 2009 and 68 in 2013, b) an agreement was established with a local company to market the farm products, c) more than 100 vehicles were rented and the Omani labor force was engaged for grading quality, sorting and packaging, d) members benefits were increased through an increase in production and revenue, and e) an increase in the number of greenhouse.



## Methodology

The study followed the qualitative research method which includes focus group discussion with farmers and face-to-face structured questionnaire surveys - to elicit farmers' views on the pre-identified factors that were perceived to be affecting the long-term sustainability of the agriculture sector. In addition, views were also sought on the possibility of promoting collective actions at the village-level as a potential way to effectively address the key issues and challenges that farmers faced. To promote credibility of the findings the following 'triangulation'<sup>3</sup> method was adopted in this study (see Figure 1).



**Figure 1: Types of 'triangulation' adopted for the study of the phenomenon under scrutiny**

In addition, a pilot study was conducted involving a traditional village (the village Ghafat of the wilayat Bahla, Al-Dakhilyah Governorate) and informal discussions were held with owner-operators to gain an understanding of the issues and challenges constraining the sector's progress towards sustainability. The information gathered and the understanding gained from the pilot visit helped determine the important elements of inquiries for the subsequent field visits to selected villages. Although in-depth interview is an expensive and time consuming technique of collecting information and data, the use of such method in this study was guided by the objective of obtaining reliable and direct information through a detailed and open discussion with the farmers.

## The Selection of Case-study Villages, Focus Group Discussion, and Questionnaire Survey

Two case-study villages namely Birkat Al-Mouz (from Al-Dakhilya Governorate) and Afy (from Al-Batinah Governorate) were selected for focus group meetings and questionnaire surveys. In selecting these two villages, judgments were made based on the distinctive attributes observed during the field visits. These distinctive attributes of both villages such as locational advantage (i.e., traders' access to village, village placement in rural-urban continuum), farmers' access to basic infrastructure (such as markets, existing transportation and distribution networks, and utilities, that result in low transaction costs so as to facilitate trade of agricultural goods and services), future plan for infrastructure development in the Governorate, the tradition of collective action in the Governorate, relatively promising resource endowment (for example, fertile land

<sup>3</sup>In qualitative research, the term 'triangulation' is used to indicate the application of a combination of several methods of collecting data to study the phenomenon under scrutiny (see Shenton, 2004).

and an active falaj system), village is medium sized and comparatively condensed and, positive attitude of local farmers, etc. - are all conducive to the development of collective action institutions.

## Results

### Findings from the Focus Group Discussion

The focus group meetings involving two selected villages namely Birkat Al-Mouz and Afy were held on July 3, 2013 and July 8, 2013 at the local Wali's Office respectively. The key findings categorized under various elements comprising outputs and productivity, factors of production, management, market performance, and government support are presented in the Tables 3 and 4.

The views of the participants illustrated the fact that the present farming practices are not at their best level thereby undermining the potential progress towards sustainability. The reasons, described by the participants, were many-fold and the main reasons included: land fragmentation, perceived slump in profitability due to high costs of inputs, inefficiency in input uses, underdeveloped markets, apparent lack of government supports, regulatory complications and ineffectiveness, inequity in water distribution, misuse of fertilizer, problems with pests and diseases, lack of skills and expertise of expatriate labor force. Following the interview protocol a consensus on the identified issues was reached at the end of the focus group meeting. Yet again, the issues and challenges raised in the meetings were similar to the issues identified through the literature review and the field visits. More importantly, the issues identified by the initial participant(s) were repeated and no additional points were added by the remaining participants during their allocated time of contribution. This suggests that the point of information saturation was reached which is one of the main argument in defense of the richness of information in qualitative research based on small samples<sup>4</sup>.

**Table 3: Results from the focus group meeting at Birkat Al-Mouz**

<p><b>Output &amp; Productivity</b></p> <ul style="list-style-type: none"> <li>• Farming is unprofitable and high costs of pesticides and other inputs leads to low returns.</li> <li>• Problems with pest and diseases and a lack of immunisation program for livestock.</li> <li>• Lack of crop diversification.</li> </ul> <p><b>Land</b></p> <ul style="list-style-type: none"> <li>• Shortage of land for livestock production.</li> <li>• Small and isolated holdings (land fragmentation) and isolated lands create obstacles for effective irrigation and land management.</li> <li>• Transformation of agricultural land to other commercial uses.</li> </ul> <p><b>Water</b></p> <ul style="list-style-type: none"> <li>• Falaj is active but misuse of water resulted from the poor construction of falaj openings.</li> <li>• Presence of traditional irrigation system led to inefficient use of water due to flood irrigation.</li> <li>• Problem in water distribution.</li> <li>• Agricultural lands that lie outside falaj area have water problem and use water from wells.</li> </ul> <p><b>Labour</b></p> <ul style="list-style-type: none"> <li>• Lack of awareness among farmers regarding the use of pesticides.</li> <li>• Lack of collaboration among farmers.</li> <li>• Old falaj system cannot be modified.</li> <li>• Skills deficiency among expatriate labours.</li> <li>• High costs associated with the employment of foreign labours.</li> </ul>
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<sup>4</sup>A similar situation was experienced in the case of fisheries sector (for instance see Al-Subhi et al., 2013). As legitimately argued in a number of studies that if the net benefit (measured in terms of new information and research costs) resulted from an additional participant is judged to be insignificant compared to the costs incurred then any attempt to increase sample size would not be economically justifiable (For instance, Bose and Cress-Morris, 2009).



**Management**

- Issue of health care for expatriate labour and complication arising with the escape of foreign labour.

**Government Support**

- Lack of support from the government (financial, extension services, and technical).
- Delayed support from the government regarding inputs (seeds, fertilizer etc.).
- At present focussing on production for self-consumption, however with the appropriate government support they are interested in commercial production, and greenhouse operation.
- Inequality in support to farmers.
- Failed to receive government support for poultry and livestock production and adoption of modern irrigation.
- Lack of regular workshops and seminars to promote awareness and establish strong communication between farmers and MAF.
- Lack of support for pesticides and fertilizer, and application of wrong pesticides.

*Source: Field survey.*

**Table 4: Results from the focus group meeting at Wadi Al-Maawel**

**Output & Productivity**

- Problems with pest and diseases; lack of pesticide spray.
- Misuse of fertilizer.
- The existing agricultural practices are not sustainable.
- Compacted tree plantation creates problems (pest and disease).
- Agricultural farming is not cost-effective and therefore uneconomic.
- Agricultural inputs are not in their best use resulting in low productivity.

**Land**

- Agricultural lands that lie outside falaj system are subjected to water scarcity and use water from wells.
- Small holdings (land fragmentation)

**Water**

- Issue with the current arrangement of falaj water distribution.
- Lack of regular maintenance of wells.
- Mismanagement of wells water shares.

**Labour**

- High costs associated with the employment of foreign labours.

**Management**

- Regulatory complication arising with the escape of foreign labour.
- Absence of Public Marketing Authority to ensure upward flow of agricultural products and services.
- Economic incentives may lead to collective action/collaboration.

**Government Support**

- Lack of support from the government (financial, extension services, and technical).
- Low number of Ministry staff
- Lack of regular workshops and seminars to promote awareness.
- More financial support should be made available to support agricultural practices.

**Market Performance**

- Local products are not available in the local market.
- Local markets are not operating freely (due to the influence of foreign labour in controlling supply).
- Lack of appropriate market outlet.
- Marketing issues need urgent attention to create momentum in the sector.

*Source: Field survey.*

## Findings from the Questionnaire Survey

After completing the open discussions, a structured questionnaire survey was used to elicit participants' level of agreement on the pertinent issues and challenges established from the review of existing literature, pilot study, field observations, and the focus group discussions. At this stage, additional questions were also asked about the prospective of collective actions programs to achieve agricultural sustainability and thereby developing meaningful strategies for rural development. The following Tables 5, 6, and 7 present the results from the survey on the perceived changes in, and influence of, relevant factors of socio-economic importance, level of agreement

on potential issues affecting the progress towards sustainability, use of selling outlets, investment preferences, and intended government support.

The key findings noted from Table 5 were as follows. During the past decade or so, for the majority of respondents 1) the dependency on non-farm income has increased, 2) rising input costs had a negative impact on profitability, 3) a major decrease in employment opportunities in the village which is consistent with the concern with urban migration, and 4) all respondents felt that government support (in the form of input supply, crop planning, market information, livestock breeding, pest control etc.) had declined over the past decade.

**Table 5: Assessment of the perceived change in socio-economic factors**

Question: How much have the following factors changed over the past 10 years (say 2002-2012)?										
Factors	Village 1 (N=7) No. (%)					Village 2 (N=6) No. (%)				
	Major Decrease	Some Decrease	No Change	Some Increase	Major Increase	Major Decrease	Some Decrease	No Change	Some Increase	Major Increase
Dependence on non-farm income				2 (28.6)	5 (71.4)	1 (16.7)	1 (16.7)			4 (66.7)
Dependence on farm income	5 (71.4)		2 (28.6)			5 (83.3)	1 (16.7)			
Costs of farming					7 (100)				1(16.7)	5 (83.3)
Profitability of farming	3 (42.9)			4 (57.1)		5 (100)				
Employment opportunities in the village	7 (100)					5 (83.3)	1 (16.7)			
Support from the government (seed inputs, market information, crop planning, livestock breeding, pest control information etc.)	7 (100)					6 (100)				

Source: Field survey

**Table 6: Assessment of negative influence of relevant socio-economic factors**

Question: How much have the following factors influenced (negatively) the agricultural sector?						
Factors	Village 1 (N=7) No.			Village 2 (N=6) No.		
	Major (-)ve effect	Some degree of (-)ve effect	No effect	Major (-)ve effect	Some degree of (-)ve effect	No effect
Output price (low)	2	5		5	1	
Input price (high)	7			4	2	
Shortage of labor	7			1	4	1
Lack of local market for harvested products		2	3		3	
Competition with imported products		7		3		
Lack of skills and expertise	5			3		
Access to credits	2	3		2	1	

Note: If the number(s) in a row under a village is not equal (added) to the corresponding sample size, it indicates some respondent did not provide an answer.

Source: Field survey

The key findings (Table 6) were: 1) low output price (relative to the price of inputs) causes a negative impact on the agricultural sector. Majority of the respondents from village 2 believed that the impact was major while it was minor for the majority in village 1, 2) negative impact of high input prices was a major concern of all participants, 3) shortage of labor was a major concern for the participants of village 1, 4) competition with imported products is a cause of concern, 5) lack of skills and expertise is also a sign of weakness in the sector, and 6) lack of local market outlets and the access to credits are not perceived as major issues.

**Table 7: Level of Agreement on the Negative Influence of Relevant Factors**

Factors	Question: Which of the following factors do you feel are negatively affecting agricultural sustainability?														Difference between villages? (p-value)		
	Village 1							Village 2								Grand Total (%)	
	Agree		Neutral		Disagree		Agree		Neutral		Disagree		Agree	Disagree			
	No	%	No	%	No	%	No	%	No	%	No	%					
Fragmentation of land	4	57.1	3	42.9			3	50.0	1	16.7	2	33.3	53.9	15.4	0.18		
Under-utilization of agricultural land	3	42.9	2	28.6	2	28.6	4	66.7	2	33.3			53.9	15.4	0.10		
Inefficient use of water resource	7	100					3	50.0			3	50.0	76.9	23.1	0.08		
Inefficiency in post-harvest activities (e.g. grading, packaging, preserving etc.)	6	85.7	1	14.3			3	50.0			3	50.0	69.3	23.1	0.08		
Lack of market outlets and marketing agency	7	100					3	50.0			3	50.0	76.9	23.1	0.08		
Low labor productivity	6	85.7	1	14.3			4	66.7	2	33.3			77.0	23.1	0.56		
Lack of technological development	7	100					6	100					100	0.0	NA		
Weakness in regulatory and legal framework	5	71.4	1	14.3	1	14.3	3	50.0	2	33.3	1	16.7	61.6	15.4	0.78		
Inadequate extension services	6	85.7			1	14.3	4	66.7	2	33.3			77.0	7.7	NA		
Lack of Government support	6	85.7	1	14.3			6	100			2	33.3	92.6	7.7	0.32		
Limited access to loans	5	71.4							1	16.7	2	33.3	38.5	15.4	NA		
Low private sector investment	7	100					6	100					100	0.0	NA		
Lack of knowledge and network	6	85.7	1	14.3			6	100					92.4	7.7	0.32		
Lack of education and skills	7	100					6	100					100	0.0	NA		
Change in attitudes and values	7	100					3	50.0			3	50.0	76.9	23.1	0.08		
Urban migration	5	71.4	2	28.6			4	66.7	2	33.3			69.3	30.8	NA		
Concern with equity and participation	3	42.9	2	28.6	2	28.6	6	100					69.3	15.4	0.06		
Overuse of fertilizer and pesticides	7	100					6	100					100	0.0	NA		
Lack of cooperatives	5	71.4			2	28.6	5		1	16.7			77.0	15.4	0.28		

Note: Results 'NA' is due to either 'only one answer' or 'the sum of (+)ve ranks equals the sum of (-)ve ranks'. Differences in total figures may arise due to rounding.

\* WSR denotes Wilcoxon Signed Ranks Test.

Source: Field survey

According to the results presented in Table 7:

- a) All participants from both villages agreed on issues such as 'lack of technological development', low private sector investment, lack of education and skills, and overuse of fertilizer and pesticides.
- b) For village 1, all agreed on the following issues such as inefficient use of water, lack of market outlets and marketing agency, change in community attitudes and values about the sector. Furthermore, six out of seven participants agreed on the factors such as inefficiency in post-harvest activities, low labor productivity, inadequate extension services, lack of government support, lack of knowledge and network (farmer). None explicitly disagreed on the issues of land fragmentation and urban migration.
- c) For village 2, all participants agreed on the following factors namely, lack of government support, lack of knowledge and network (farmer) and equity and participation (in decision-making.) None openly disagree on factors such as, under-utilization of land, low labor productivity, inadequate extension services, urban migration, and lack of cooperatives.
- d) Albeit keeping small sample size in mind, it was investigated if there was significant difference in views of the groups for each question using a non-parametric statistical test (Wilcoxon Signed Ranks (WSR) Test). The test results (see Table 7) confirmed the group's homogeneity in relation to their views on the key issues.

## Views on Collective Action

Partnership in family farming is a tradition in Oman as the close cooperation among siblings is the cultural norm. Furthermore, social bonding, kinship ties, and long standing traditions of cooperation among resource users in local communities are still the fundamental features of rural communities in Oman. The traditions of partnership in family farming and local cooperation among resource users have the potential to create an opportunity to cope with the rising input costs and make effective farming decisions, to improve sustainability in the sector<sup>5</sup>.

In the survey focus group, participants were asked to express their views on the possibility of collective actions to promote sustainability of agricultural farming. Each group of participants believed that the agricultural sector has the potential to generate income and employment opportunities. A majority of respondents agreed that facilitation of a suitable form of collective action that is conducive to the local conditions, will empower farmers to achieve sustainability in farming and contribute to the development of rural communities. A similar view was also noted from the pilot visit. However, the respondents highlighted the important role of the government in facilitating the development of collective action institutions.

If continuity and long-term sustainability of farming is a priority, then farmers' satisfaction in running an economically viable and environmentally sustainable farm should take precedence. At the same time, any form of collective action should generate considerably better results than individual farmer could achieve without joining the association. The key drivers of such action may include cost efficiency, enhancement of agricultural extension and marketing services, growth in farm income (to reduce gap between farm and off-farm income), sustainability of potential agricultural small and medium enterprises (SMEs), amongst others.

The findings presented as a result of the survey were similar (albeit differing in extent) to the views conveyed by the focus-group participants on the key issues that include the pattern

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Although it is outside the scope of this study, future research on the role of rural women in family farming activities would be worth considering.

of inefficiency in the use of agricultural inputs and resources, lack of skills and expertise, ageing of farmers, low levels of agricultural productivity, overuse of chemicals and fertilizers, land fragmentation, ineffective management of land due to absenteeism, lack of crop diversification, problems with pests and diseases, disparities in farm and off-farm income, lack of economic opportunities in rural areas, inefficiency in the operation of economic institutions (for instance, markets), lack of effective marketing arrangements, regulatory complexities in engaging expatriate labors, lack of government support among others.

These observations reaffirm the core issues and challenges identified from the literature review (see Table 1). However, even with these weaknesses and constraints it is felt that the agricultural sector has the potential to generate income and employment opportunities and therefore improvement can be achieved through the design and effective implementation of appropriate policy strategies.

Considering the long traditions of partnership in family farming and local cooperation among resource users, participants in the focus group discussion were asked to express their views on the possibility of collective actions to address these apparent weaknesses and to promote long-term sustainability in agricultural farming. With the support from the government, majority of the respondents agreed that facilitation of a suitable form of collective action that is conducive to local conditions will empower farmers to achieve sustainability in farming and developing rural communities.

## Policy Recommendations

Within the sustainable development framework, and using the notion of SARD and its practicability in the light of main trends and challenges faced by the sector, this section outlines prospective paths of action to promote long-term sustainability in the sector and to enhance sectoral contribution for addressing the important macroeconomic goals of food security and employment generation. In recommending possible paths of actions, this study draws important lessons from international (for example, Gulati et al., 2009; Prakash, 2009; Nakagawa, 2012), regional (Hertog, 2010) and local studies (Omezzine and Zaibet, 1998; Al-Said et al., 2007) that advocate possible way forward in regard to agricultural sustainability and rural development. Important lessons are also drawn from the experiences shared by the stakeholder groups during field investigations and interviews.

With regard to the recommended strategic actions, two key objectives are worth noting. Firstly, the exercise of imparting recommendations is intended to stimulate multi-stakeholder (farmers, their representative organizations, governmental and private sector leaders and other stakeholders involved in the agricultural production sector) dialogues that place farmers and the sector at the center of discussions and builds a consensus for action at the national level. Secondly, it is intended to encourage efforts to assess costs and benefits of the agreed strategic deliberations to advance governance and establish a more effective institutional framework for sustainable agriculture and to answer the question: which model scenario performs better? It must be recognized that no single strategy could deliver the extent of transformation needed to achieve long-term sustainability. However, it is believed that the prospective paths of action will be complementary to existing approaches towards sustainability. The section also highlights the key pre-requisites under each potential option for achieving operational success.

Under the economic and institutional dimensions of agricultural sustainability, the strategic importance of linking smallholder farmers to complex supply chains and of enabling smallholder farmers to remain competitive in rapidly changing market environments is appropriately

recognized in the literature. For example, Gulati et al. (2007) argued that smallholder farmers are often unable to meet stringent food safety and quality control requirements, face difficulties in supplying standardized products on a regular basis, and often lack essential market information. Farmers' inadequate physical access to markets is compounded by their frequent lack of knowledge on current market prices that can negatively affect the farm gate prices that they are offered at harvest time. The literature also suggests that with the increasing demand for high value agricultural products, such as fruits and vegetables, and the relatively high risk (due to perishability) and transaction costs associated with such products (Pingali et al., 2005) an effective vertical integration among the supply chain actors can have a profound impact on smallholder farmers.

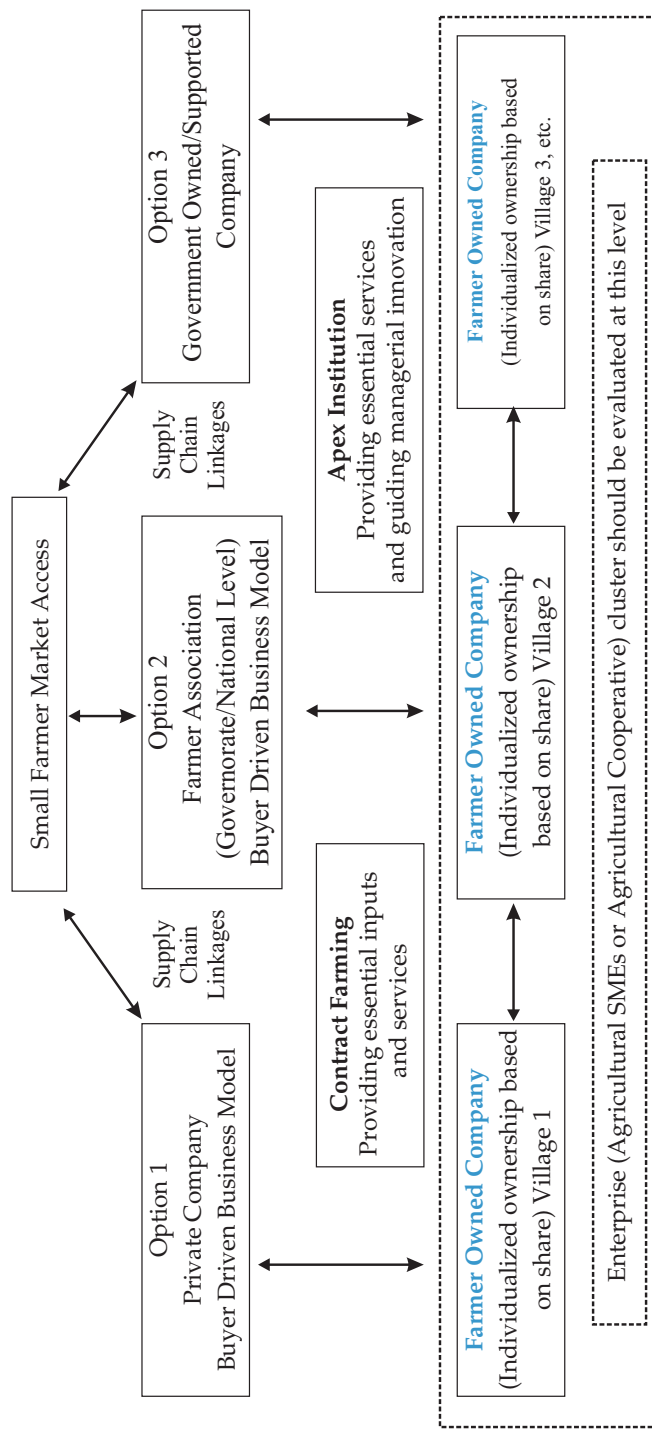
In this particular context, development practitioners often highlight the potential of collective action (this study uses 'farmer organization' as a more formal expression of collective action) in enhancing farmers' access to key markets to realize potential economic benefits. This is mainly because the benefits of collective action normally emerge through the exploitation of economies of scale in their transactions with input suppliers and buyers of their products.

In addition, with appropriate governmental support (for instance, infrastructure development, facilitation of access to financial services, facilitation of flow of market information to rural farmers, provision of skills development training in agricultural production and post-harvest processing that adds value to products) the benefits of any form of collective actions are established in the literature with respect to accessing finance, accessing output and input markets, enhancement of knowledge and farm production and the improvement of business performance. Keeping these benefits in mind, the following section highlights the most appropriate types of institutions, their corresponding linkage to smallholder farmers and the conditions necessary for ensuring their effective functioning and long-term viability.

## Recommended Options

Various models of business linkage exist in the literature, some driven by producers (such as farmer association and cooperatives), some by buyers (such as contract farming) and some supported by intermediaries including Non-Government Organizations (NGOs). It is advocated that any business model for smallholder farmers and SMEs must 1) deliver essential services to producers, 2) reduce market supply uncertainty, 3) improve cost efficiency through the reduction of transaction costs and risks that buyers (for example contracting companies) face when purchasing from large numbers of fragmented small farmers and SMEs (Vorley et al., 2008). Keeping this recommendation in mind, and to promote sustainable agriculture and rural development, this study highlights three options comprising collective action institutions (at the primary and secondary level), private companies (contracting firms), and government supported company as depicted in Figure 2 below. These options foster horizontal integration (group network) between village-level SMEs/associations or cooperatives and their vertical integration in agricultural supply chain.





**Government Support (Examples)**

- Create enabling environment;
  - by improving policy coherence and harmonizing responsibilities of various agencies for agricultural development;
  - by designing appropriate regulations to support institutions and their functions;
  - by facilitating agricultural insurance program and financial services;
  - by designing effective communicative channels for intensive and inclusive dialogues with key stakeholders;
- Support appropriate infrastructure development to help farmers, farmer groups, and small and medium enterprises;
- Establish agreement with the primary stakeholders for the provision and coordination of intended support provision to ensure appropriateness and transparency;
- Initiate appropriate incentives to promote collective actions;
- Address market failures as poorly functioning markets have been a challenge to agricultural development in Oman;
- Improve the flow of market information to rural farmers;
- Intensify efforts for farmers' capacity development through extension services;
- Initiate effective public awareness programs to develop public image of the agricultural sector;
- Establish mechanisms of rewarding productive farmers and farming business;
- Facilitate technology oriented agricultural development; etc.

**Figure 2: Description of the proposed model options along with government support.**

## Village Level Farmer Owned Company - A Form of Collective Action

Village Level Farmer Owned Companies are primary level village-based institutions, and farmers are expected to have company shares according to their respective assets (for example, land and water with retained private property rights)<sup>6</sup>. It is expected that the shareholding company will introduce managerial and technological innovations in agricultural production and supply chain through managerial skills and leadership, and through the adoption of the concept of 'joint use' and clustering. Clustering among the village-level companies is promoted to enable managerial innovations in farming practices, to create bargaining power, establish business networks, improve cost efficiency (through resource pool) to reduce risk of opportunistic behavior, to increase uniformity in agriculture produce, and to reduce transaction costs with potential contracting firms.

This form of collective action has the potential to act as a possible driving force for rural development and to generate some rural employment (Meinzein-Dick and Di Gregorio, 2004). It can also contribute to solving local markets (output and input markets) imperfections implying that farmers will be able to trade at real market prices. However, the success of this form of collective action at the primary level depends mainly on: 1) strong member involvement and sense of self-interest, 2) appropriate recognition to rights over land and water, 3) mutual trust and governance (it may require additional governance mechanisms to limit detrimental behaviors), and 4) effective leaderships, and business and managerial skills. After the establishment of the village-based enterprise, smallholder farmers' access to market can be facilitated through either one or a combination of the following mechanisms.

## Contract Farming through Private Companies/Processors/Traders

Contract farming is defined as forward contracts specifying the obligations of farmers and buyers as partners in business, and legally it entails the farmers' obligation to supply the quantities and qualities as specified in the contracts, and the buyers' (companies/processors/traders) obligation to buy the produce at the agreed price (Damardjati, 2004). Financial or non-financial services may be provided by the contracting company and service charges are usually deducted from the farmers' final sales revenue. In this option buyers will act as linkage between farm and market. The benefits derived from contract farming are to a great extent similar to those of farmer cooperatives (Simmons, 2004). However, to take advantage of the contract farming arrangement, FAO (2012) advocated several key preconditions such as 1) establishment of a common purpose, 2) adherence to a clear and precise legal framework, 3) transparency in price, product quality and quantity determination, 4) transparency in input supply, and use, 5) transparency in risk sharing, 6) honoring contractual terms and conditions, and 7) clear mechanism of dispute settlement.

## Secondary Level Farmer Organization (Associations or Cooperatives)

In this option, a secondary level farmer organization at the governorate/national level can provide further leadership and managerial support to the village level shareholding company through the provision of marketing, financial, technology, training and welfare service. It can also facilitate collective production activities that are critical to the success in accessing markets. This option has the capacity to promote development beyond local levels thus offering benefits to the rest of the community.

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<sup>6</sup>Robust criteria need to be developed to determine the economic value of shares and benefits distribution.

At the core of any form of collective action lies a core group of individuals who recognize they face a common problem or perceived opportunity and are prepared to work cooperatively to address common goals. However, although common economic or social issues represent necessary condition for cooperative development, they do not appear to be sufficient conditions (Harris et al., 1996). The process of establishing viable organizations is not a simple one. It is often a challenge to establish the rules on which farmer organizations are based; to secure commitments on the part of the group members to abide by collectively-agreed rules; and to monitor and enforce compliance with the set rules. To achieve the best out of this type of institution, the following typical challenges mentioned in Table 8 must be addressed.

**Table 8: Challenges with traditional cooperative enterprises**

Free rider problem	Free-rides can be either internal or external. The internal free-rider problem arises when new members of an agricultural co-operative immediately gain the same benefits as existing members (positive externality) while the external one arises when non-members benefit from the collective action of co-operative members, without bearing any of the joint organizational costs of the co-operative.
Horizon problem	It arises due to disparity in some members' anticipated membership period and the time frame required benefit from future investments undertaken by the co-operative. Members close to retirement from farming may not have an incentive to support and direct co-operative funds into projects that will not realize a financial benefit for them personally, even though the proposed investment is in the long-term interest of the co-operative.
Portfolio problem	It arises when some members' personal risk profiles may not be compatible with the strategies recommended by the Board of Directors.
Influence costs problems	It may arise in a co-operative as it can have multiple and potentially conflicting objectives.
Member Participation	Since the benefits of collective action emerge primarily through the exploitation of economies of scale, low participation rates in joint activities may put a serious threat to the success and viability of farmer groups.

Source: Cook (1995), Cook and Iliopoulos (2000), to name a few.

## Government Supported Company

This type of apex institution can provide effective leadership as well as regulatory and managerial support to the village-level shareholding company including the provision of marketing, financial, technology, training, and welfare service, and the facilitation of collective production activities that are critical to shareholding company success in accessing markets. This option can act as a vehicle in accessing the knowledge of the private sector as the new technological knowledge and innovation are priorities. This type of institution can also play an effective role in creating a supporting policy environment for progressing towards the sustainable development pursuits and works where private sector may be unable to provide essential services to farmers due to high transaction costs and other risks.

The success for this type of Company depends on several factors such as 1) achievement of mutual trust and effective governance (it may require additional governance mechanisms to limit the detrimental behaviors), 2) effective leaderships and business and managerial skills, and 3) appropriate government support in reducing policy uncertainties and creating level playing field for the agricultural sector. Although there are benefits to collective activity, empirical evidence (see Fairbairn et al., 2000) and stakeholders' views suggest that the successful formation of an association/cooperative require outside institutional support that help farmer-members understand the problems they are facing and suggests a cooperative model as a solution to these problems. Stakeholders' views hinted at this critical issue as farmers find it difficult to coordinate their individual actions to achieve these benefits. In some cases, the establishment of farmer

organizations incurs high transaction costs which may discourage farmers to be involved in collective actions. Furthermore, a successful association requires management and entrepreneurial skills that many small producers with little education are less likely to have.

In addition to the potential benefits associated with the collective action program (as mentioned above), collective action has distinctive link to agricultural sustainability as it promotes: 1) farmers' empowerment through skills development training, networking and accessing relevant information, 2) economic viability through the attainment of 'economies of scale' (in both inputs and output markets), 'economies of scope' through vertical and horizontal integration, and cost-efficiency through resource pooling, 3) product quality, land and water conservation and management, control over the use of pesticide and chemicals; 4) community acceptability and resource stewardship; 5) public-private partnerships; 6) quality of life amongst others. These attributes of collective action are consistent with the SARD (Sustainable Agriculture and Rural development) principles and has the potential to effectively address the key challenges identified previously.

## Concluding Remarks

The preceding optimistic view has to be tempered with the awareness of the constraints that all business models face. This study indicates that a strong rationale exists for supporting a pilot study to answer the key question: which model scenario is economically viable, institutionally feasible and locally conducive to successfully tackle the challenges faced by the sector (see Table 1) and progress towards sustainability?

A pilot study should provide the policy makers with a quantitative assessment of the framework's viability and likelihood of success. It should also provide essential information for developing a strategic plan and identify any constraints to the development of the preferred option(s). Using an integrating concept of sustainable livelihoods and to provide a snapshot of economic potentials of a traditional village, the proposed pilot study should also identify the potentials of additional income generating activities such as: 1) production activities involving livestock, poultry, honeybee, etc., 2) backward linkages that provide goods and services for agricultural production to agricultural SMEs, 3) small enterprises comprising handicrafts production using agricultural by-products and the opportunities for other potential value added products, and 4) non-consumptive use values of agriculture such as tourism. Identification of such economic potentials will have the opportunity not only to diversify rural household income (if possible) to improve food security and expand the capacity to satisfy its basic needs but also to recognize the contribution of women in agricultural development.

Finally, government supports are essential in designing an appropriate policy, legal and judicial system to create an enabling environment to exploit economies of scale and promote competition, develop infrastructures to help farmers, farmers' group, and small and medium enterprises, facilitate access to financial support, and initiate appropriate incentives to promote collective actions. It should also address market failures as poorly functioning markets have been a challenge to agricultural development in Oman, improve the flow of market information to rural farmers, develop strategy for public awareness campaign, encourage private investment, initiate policy reforms, provide skills development training and extension services, and support the risk-taking behavior of agricultural farmers (see Figure 2). It should be recognized that agricultural sustainability is not optional - it is essential for achieving sectoral as well as national developmental goals.

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