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VOLUME I – ASSESSMENT OF THE AGRICULTURAL SECTOR IN JORDAN

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Water harvesting in NE Jordan

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Acronyms & Abbreviations

1.	AAAD	Arab Authority for Agricultural Development
2.	ACSAD	Arab Center for the Study of Arid Zones and Dry Lands
3.	AFD	French Agency for Development (French)
4.	AFESD	Arab Fund for Economic and Social Development
5.	AOAD	Arab Organization for Agricultural Development
6.	BRP	Badia Ecosystem Restoration Program
7.	BS	budget support
8.	САР	Common Agriculture Policy
9.	CBC	Cross-border cooperation
10.	СВЈ	Central Bank of Jordan
11.	COSOP	Country Strategic Options and Opportunity Paper
12.	CPE	Country Programme Evaluation
13.	CPF	Country Programming Framework
14.	DOS	Department of Statistics
15.	DPL	Development Policy Loan
16.	EIB	European Investment Bank
17.	ENPI	European Neighbourhood Partnership Instrument
18.	ENRTP	Environment and Sustainable Management of Natural Resources(French)
19.	EUD	European Union Delegation (to Jordan)
20.	FAO	Food and Agriculture Organization of the UN
21.	GCC	Gulf Cooperation Council
22.	GDP	Gross Domestic Product
23.	GEF	Global Environmental Facility
24.	GOJ	Government of Jordan
25.	GIZ/GTZ	Deutsche Gesellschaft fir Internationale Zusammenarbeit (German)
26.	GVA	Gross Value Added
27.	ICARDA	International Center for Agricultural Research in the Dry Areas
28.	ICBA	International Biosaline Agriculture
29.	IOE	Independent Office of Evaluation, IFAD
30.	ISDB	Islamic Development Bank
31.	ISSP	Institutional Support and Strengthening Program
32.	JRV	Jordan Rift Valley
33.	JVA	Jordan Valley Authority
34.	KAC	King Abdulla Canal
35.	KF	Kuwait Fund
36.	KTD	King Talal Dam
37.	LHAP	Land and Human to Advocate Progress
38.	MIT	Ministry of Industry and Trade
39.	MOA	Ministry of Agriculture
40.	MOE	Ministry of Environment
41.	МСМ	Million Cubic Meter

42.	MEMR	Ministry of Energy and Mineral Resources					
43.	MOL	Ministry of Labour					
44.	МОН	Ministry of Health					
45.	MOPIC	Ministry of Planning and International Cooperation					
46.	MWI	Ministry of Water and Irrigation					
47.	NCARE	National Agricultural Center for Research & Extension					
48.	NGOs	Non-Government Organizations					
49.	NIP	Neighbourhood Involvement Program					
50.	NVA	Net Value Added					
51.	ODA	Official Development Assistance					
52.	OECD	Organization for Economic Cooperation & Development					
53.	OS	Operation Surplus					
54.	POPs	Persistent Organic Pollutants					
55.	SBS	Sector Budget Support					
56.	SPA	Sector Programme1 approach					
57.	SWOT	strengths, weaknesses, opportunities and threats					
58.	TAIEX	Technical Assistance & Information Exchange instrument					
59.	TIPOs	Technological, Institutional and Policy					
60.	UNCBD	UN Convention on Biological Diversity					
61.	UNCCD	United Nations Convention to Combat Desertification					
62.	UNDAF	United national Development Assistance Framework					
63.	UNDP	United Nations Development Program					
64.	UNFCC	UN Framework Convention on Climate Change					
65.	UNFPA	UN Population Fund					
66.	UNIDO	UN Industrial and Development Organization					
67.	USAID	United States Agency for International Development					
68.	VA	Value Added					
69.	VCA	Value Chain Analysis					
70.	WAJ	Water Authority of Jordan					
71.	WLI	Water & Livelihood Initiative					
72.	WWTP	Wastewater Treatment Plant					
73.	WTO	World Trade Organization					

1. The EU Pre-Identification Mission

1.1. Purpose

To inform the European Union on the **relevance** of supporting the development of the agriculture sector², especially in light of the **European Union/ Jordan Action Plan**³ and the Association Agreement⁴ developed to realize this plan as embedded in the European Neighborhood Policy⁵.

1.2. Specific Objectives

The specific objectives of this mission are as follows:

- Obtain up-to-date information (and subsequently identify information gaps) related to the agricultural sector and assess the magnitude of its contribution to poverty reduction and/or economic growth in Jordan;
- Undertake an in-depth analysis of key agricultural subsectors to identify their constraints, opportunities and potential interventions for development, especially in light of the Association Agreement signed with the European Union. This shall include at least a supply/demand analysis of domestic, regional and international markets and an assessment of food safety and SPS requirements and degrees of compliance;
- Identify a number of areas, where and how possible future EU interventions can most effectively contribute to the development of the agriculture sector in Jordan (esp. through sustainable agricultural development, rational natural resource management, enterprise development, rural tourism etc.). If the relevance of an EU support to the sector was found, the Mission will put forward under the, Recommendations Section, the composition and TOR for a second Mission that will look thoroughly into the feasibility of providing development assistance to the proposed areas of intervention.

1.3. Activities

First phase (December 2011 - 15 February 2012:

Preparation of the draft Inception Report (IR). The IR included the plan of work and annotated outline of the Final Report's three documents (Assessment, synthesis; gap analysis and recommendation).

 \checkmark Retrieval and analysis of relevant documents and data

Relevant National and development partners' strategy, policy, organizational and budgetary documents, data and sources of information were reviewed by the Mission, thanks to preliminary contacts with EUD Task Manager, EU Affairs Office at the MOA, ⁶personal contacts

² Agriculture is broadly defined to include all elements of the primary sector including crops (food and non-food), fruits, vegetables, livestock, poultry and honey.

³ http://ec.europa.eu/world/enp/pdf/action_plans/jordan_enp_ap_final_en.pdf.

⁴ http://europa.eu/eur-lex/pri/en/oj/dat/2002/I_129/I_12920020515en00030165.pdf.

⁵ The European Neighborhood policy is in particular responsive to the Government of Jordan's (GOJ) "National Plan for Political Development", and the ""National Social and Economic Action Plan" which aim to develop a sustainable socioeconomic reform process supported by a transparent, democratic and accountable political environment.

⁶ EUD : Mr Olivier Boudart Attache' Programme Manager, Local Governance, Agriculture & Aid effectiveness

and internet search. Varied and extensive sources of information about the donors and international partners operations in Jordan, including OECD AidData⁷, partners' home pages, and personal contacts by Team members were retrieved and shared in a Mission Shared Dropbox Folder (listed in ANNEX 8). This allowed for drawing a preliminary list of programmes/projects implemented in Jordan in the agricultural and related sectors over the last decades with information on focal areas, funding value and source, involved partners and timeframe. All the information was shared among the Team and analysed according to areas of competence.

✓ The draft IR was submitted on 15 February 2012 and was approved by EUD. Recognizing the need to have an in-depth follow-up with the Mission, a Technical Committee of Focal Points (CFPs)from the MOA⁸ assisted by the Director of Studies and Policies provided guidance to the mission, coordinated meetings with the major stakeholder categories⁹ and provided feed back to the IR.

Second phase (18 February - 16 March 2012:

- ✓ Meetings in Amman with EUD, MOA Focal Points key resource persons, representatives of public and private institutions, international and regional partners
- ✓ Field visits (in North West and East, Central and South Jordan) to farmers, herders, governorate agricultural offices, NCARE stations, slaughter houses, vegetable and fruit markets, quarantine and custom stations, and a wild life reserve (Annex 1)
- ✓ SWOT analysis of the major subsectors
- ✓ First Stakeholder Workshop to discuss and validate the SWOT analysis

Third phase (16 March - 30 June 2012:

- ✓ Preparation of zero draft for Volume I of the Final Report (Assessment of the Agricultural sector).Deadline 30 March 2012, revised 15 April 2012; discussion with EUD and MOA Focal Points Committee
- ✓ Feedback of EUD and the Focal Points on Volume I
- ✓ Second Stakeholder Workshop (very high level policy makers –insights, synthesis and recommendations) May or June 2012
- ✓ Finalize the Synthesis report (Volume II) -
- ✓ Third stakeholders (senior professionals and representatives of other stakeholder categories) meeting to discuss outcomes of the gap analysis and feasibility of proposals for future studies and other interventions, (Volume III)
- ✓ Submission of the Final Report (revised Volume I, Vol II and III) deadline 30 June 2012

MOA/EU-Affaires: Dr Amani Khudair

⁷ Source: http://www.aiddata.org/content/index

⁸ The Committee of Focal Points was formed and chaired by the General Secretary of the MOA Dr Radi Al Tarawneh and consisted of Eng. Fuad Al Muhaisen AGS, Eng. Salman Al Rkeibat AGS, Eng. Mohamed Abu Jamous Director of M&E and Dr Amani Khudair EU-Liaison Officer

⁹ Major stakeholder categories: (i)High level decision makers; (ii) senior public administrative, service and technical professionals; (iii) farmers and herders and their community and professional organisations; (iv)representatives of the private sectors; (v) representatives of the private educations and development institutions, and : (vi) International /national partners and NGOs.

1.4. Content

The first and second phase of the mission were dedicated to updating the information and identified the gaps related to the agricultural sector in Jordan following a thorough detailed research, review of documents and contacts with international stakeholders⁻

The content focuses primarily on the following areas:

- The biophysical and environmental status including total land surface, agricultural area (irrigated, rainfed, deep-bore irrigation systems), rangelands, forests, water resources, water management, climate change, oasis and tourist attractions;
- The socio-economic status and changes in Jordan (among the Bedouin, urbanization, migration, immigration), rural population, number of farms, trends in farm size, rural employment employees and manpower in agriculture;
- The institutional and administrative frameworks and role of decentralized authorities or parastatal institutions in the agricultural sector. Description of national institutions responsible and/or involved in agricultural and related areas e.g. food, water, land use, trade, pollution control, forests, biodiversity, climate and meteorology, public health, food safety etc.;
- The agricultural sector; based on above data, underlining the main agro-ecological zones, production sub-sectors: agronomic food crops (cereals, legumes), horticultural crops (fruits and vegetables), livestock (small ruminants, dairy), honey and wildlife habitat products;
- The competitiveness of the agricultural sector. This will involve review of the agro-industry subsector based on the visits to major businesses, discussion with the stakeholders, and review of the results of the existing commodity VCA reports. Attention will be given to the role of the private sector in enhancing the competitiveness of the agricultural sector through provision of services, injection of rural financing, development of markets, and stewardship of equitable and sustainable trade;
- The relevant/relevance/effectiveness of national policies, strategies, laws and programmes e.g. agriculture and rangeland, water, environment, biodiversity, trade , price policies and compliances e.g. SPS, transboundary animal movement;
- The role of public/ private services, community institutions and NGOs along the agriculture value chain: Research, education, training, professional associations, inputs suppliers and services providers.

1.5. SWOT analysis and validation Workshop

The first and second phases of the pre-identification mission (December 2011- March 16, 2012) included an in-depth analysis of the strengths, weaknesses, opportunities and threats (SWOT analysis) facing agricultural sector in Jordan. The results of the SWOT analysis (Annex 2) were validated /refined /focused through a very well represented stakeholders' workshop with representatives of the major stakeholder categories¹⁰ held in Amman Jordan on 15 March 2012). The workshop was composed of two plenary sessions and five breakaway groups. Each Group members developed their own SWOT analysis for the 5 Subsectoral areas Agronomic

¹⁰ Major stakeholder categories: (i)High level decision makers; (ii) senior public administrative, service and technical professionals;(iii) farmers and herders and their community and professional organisations; (iv)representatives of the private sectors; (v) representatives of the education and development institutions, and : (vi) International /national partners and NGOs.

crops, vegetables& horticulture, Livestock, Agriculture and food industry. The results of the stakeholders SWOT analysis and the workshop conclusions and recommendations are in Annex 2 and 3

The synthesis and information gap analysis aimed to offer policy makers the knowledge and tools needed to develop a pragmatic, sustainable, poverty reduction oriented agricultural sector capable of addressing Jordan's vulnerability to food insecurity¹¹.

The following is a summary list of possible deliverables (outcomes)

- a) Identification and assessment of the obstacles (status and framework conditions) that impact on the performance and competitiveness of the agricultural sector (natural resources, environmental, socioeconomic, policy and legal);
- b) Identification of other causes of vulnerability and rural poverty;
- c) Inventory and map of the main institutions and players (farming and herding communities/organizations/ cooperatives, public and private sector institutions);
- d) Identification of the products: agronomic crops, horticultural crops, livestock, others;
- e) Overview of performance of the sector over a specific period (e.g.10 or 20 years) with the purpose of drawing lessons from trends;
- f) Identification of the markets (local, regional and international), commodity prices (wholesale and retail) and, if possible, compare with regional and international prices;
- g) Assessment of the competitiveness of the sector and the options for export in view of compliance with trade agreements; and reforms in tax and price policies 'etc.;
- h) Identification of the opportunities for rural poverty reduction / agriculture based economic growth through innovation approaches, practices and solutions (e.g. contract farming, environmental services, biofuels, eco-tourism and related enterprises; new social policies;
- i) Identifying gaps in the existing data, information and knowledge; gap analysis and recommendations:

1.6. Recommendations of possible future interventions

<u>The outcomes</u> are expected to assist EU to identify future interventions that could effectively contribute to develop feasible development assistance programs in Jordan supportive of relevant interventions directed towards achieving two broad goals:

- ✓ <u>Rural poverty reduction</u>: Through measures to lift the economically disadvantaged farmers and herders from dependence on welfare to produce enough food, generate enough cash from sale of farm products, engage in off-farm income generating activities (IGAs) ,educate their children and create sustainable opportunities for their children;
- <u>Enhance the competitiveness of the commercial sub-sectors</u> (farmers and herders) at the local, regional and international markets without undermining the opportunities and competitiveness of the small poor famers.

1.7. Sources of Information

¹¹ FAO has identified Jordan as one of the 7 most vulnerable countries to the impact of high food prices, and among the top four water –poorest nations in the world

a) National sources

- ✓ MOA: Vision outlook for the agriculture sector in Jordan; agricultural sector assessment, national strategy, and budgets, rangeland strategy, national center for agriculture research and extension, Agricultural Document 2009;
- ✓ MOPIC: Coordination of ODA and poverty reduction, implementation support to rural entrepreneurship initiatives, coordination of socio-economic productivity initiatives;
- ✓ MWI: national strategy, water strategy, action plan, budgets;
- ✓ Agriculture Credit Cooperation (ACC) and other sources of rural and social financing;
- ✓ MOE: National environmental strategy, and action plans, national biodiversity strategy;
- ✓ BRP: Action Plan and Road Map for the restoration of the Badia ecosystems.

b) <u>EU sources</u>

- ✓ Policy and strategies defining the cooperation framework with Jordan: Association Agreement, ENPI Action Plan, CSP and National Indicative Programmes, Annual Action Programmes.
- ✓ ENPI country progress reports and Country Strategy evaluation (2007).
- ✓ Action Fiches and reports related to EU-funded programmes and projects.
- ✓ EU newsletters and other publications on EU Common Agriculture Policy (CAP), Acquis Communautaire and ENPI policy and operational guidelines.

c) Other sources

- ✓ The documents produced by the two major multilateral institutions (FAO and IFAD) mainly involved in supporting the agriculture sector in Jordan were consulted widely. Also, the R&D work by ICARDA, especially in areas of community development/ action planning, crop improvement, crop-livestock interactions, water management, adaptation to climate change, and agro-biodiversity supported by IFAD, AFESD and USAIDs, etc.) were reviewed/analysed;
- ✓ Country profiles, cooperation strategies and programme reports from other UN agencies (UNDP,UNEP,WFP,IFAD-GEF), international and regional development banks (The World Bank, Islamic Development Bank) and bilateral donors (UK; Germany, France, Italy, USAID, etc.) were also retrieved and analysed;
- ✓ Jordan's adherence to Multilateral Environmental Agreements was assessed through the Conventions' Secretariats and the Plans and reports related to UN Conventions on Biodiversity (UNCBD), fight against Desertification (UNCCD), Climate Change (UNFCCC) and Persistent Organic Pollutants (POP);
- ✓ Jordan's membership in WTO in 2000 following successful accession to the General Agreement on Tariffs and Trade (GATT) was reviewed and assessed from the view of the Country's commitments.

2. The EU-Jordan Cooperation Framework

2.1. The policy miles Tonnes and the strategic objectives

The EU-Jordan cooperation has evolved during the last decades in accordance with the development of EU external relations policies and the reforms of its cooperation strategies. With the Barcelona Declaration in 1995 and the launching of the Euro-Mediterranean Partnership, several countries started negotiations with the EU for the definition of an <u>Association Agreement</u> (AA) that in the case of Jordan was signed on 24/11/1997 and entered into force in 2002. The primary objectives of Barcelona Declaration and of the AA are to contribute to peace, political stability, economic prosperity and social security in the EuroMed region and to enhance dialogue and cooperation in all the sectors of common interest.

Since 1995, the technical and financial cooperation of the EU with Jordan (and the region) was defined and programmed under the MEDA I (1995-1999) and MEDA II (2000-2004) Regulations. In 2005, following the EU south-eastern enlargement (EU27), a new European Neighbourhood Policy (ENP) was defined together with its cooperation instrument (ENPI) and the related political and technical dialogue platforms (Association Committee and thematic sub-Committees).

The ENP <u>Action Plan</u> for Jordan was adopted in 2005 to "help devise and implement policies and measures to promote economic growth, employment and social cohesion, to reduce poverty and to protect the environment, thereby contributing to the long-term objective of sustainable development."

For example, the Action Plan and the ENP <u>Country Strategy Paper</u> (CSP) for the period 2007/2013 reiterated and strengthened the objectives of the Barcelona Declaration establishing four strategic objectives as follows:

- *a)* Supporting Jordan's political and security reform in the areas of democracy, human rights, good governance, justice and the fight against extremism.
- *b)* Developing further trade and investment relations: exploiting the full potential of the free movement of goods and services; preparing Jordan's participation in the internal market; improving trade logistics and transport.
- *c)* Ensuring the sustainability of the development process, with better management of human and natural resources.
- *a)* Further building the capacity of Jordanian institutions, by investing in strengthening public administration, ensuring financial stability and supporting regulatory approximation with EU legislation.

These strategic objectives represent the priorities for EU-Jordan political dialogue and for the identification of specific initiatives to be funded under the ENPI National Indicative Programmes (NIP). During the current CSP validity period, two NIPs have been approved, respectively for the periods 2007-2010 and 2011-2013. Further programming and funds mobilization decisions are taken through the elaboration and approval of Annual Action Programmes (AAP) regularly monitored by the meetings of the Association Committees (including the thematic subcommittees) and the release of ENP Annual country reports.

In October 2010, the EU-Jordan Association council acknowledged Jordan's good progress in the implementation of the agreed reforms and agreed to establish the "advanced status" relationship between the country and the EU. An <u>EU-Jordan Task Force</u> with high-level representatives of EU institutions and he Government of Jordan met¹² in Amman on February 22nd 2012 to confirm mutual cooperation commitment and to accelerate the reforms process and to implement the New Action Plan.

2.2. The place of agriculture in the current strategic framework

The EU-Jordan Association Agreement (AA), in establishing the framework of a long-term cooperation process, mentioned agriculture in two different perspectives, namely free movement of goods (Title II) and Economic cooperation (Title V). In the first scenario, the EU and Jordan committed themselves to gradually implement greater liberalisation of their reciprocal trade in agricultural products according to protocols establishing the list of products and the provisions set out to access respective markets. The trade-related issues received a primary attention in the meetings of Sub-Committee on Agriculture and fisheries¹³.

In the second scenario, the parties shall focus their cooperation in the agriculture sector on:

- ✓ support for policies implemented by them to diversify production;
- ✓ promotion of environment-friendly agriculture;
- ✓ closer relations between businesses, groups and organisations representing trades and professions in Jordan and in the Community on a voluntary basis,
- ✓ technical assistance and training,
- ✓ harmonization of Phytosanitary and veterinary standards,
- ✓ integrated rural development, including improvement in basic services and development of associated economic activities,
- ✓ Cooperation among rural regions, exchange of experience and know-how concerning rural development.

In addition to the agriculture section, the AA underlined the importance of preventing the deterioration of the environment and ensuring the rational use of natural resources with a focus on desertification, water resources management and the impact of agriculture on soil and water quality with the aim of enhancing knowledge-based management, monitoring and prevention systems, as well as environmental education and awareness.

¹² Source: EU Delegation - http://eeas.europa.eu/delegations/jordan/index_en.htm

¹³ Sources: Minutes of the sub-Committee held in 2010 and 2011

Furthermore, the 2005 Action Plan (AP) aims at implementing policies and measures to promote economic growth, employment and social cohesion, to reduce poverty and to protect the environment, thereby contributing to the long-term objective of sustainable development. The AP underlines the support to the decentralization process in services delivery and management at Governorates level as a crucial contribution to the reduction of regional disparities and to poverty alleviation, especially in rural areas. In the AP, the parties agreed to prioritize actions contained in the existing Jordanian sustainable Development Strategy and those resulting from the gap analysis jointly carried out.

In consideration of recent development in the region, support to agriculture and rural development in southern ENP partner countries is considered by the EU¹⁴ as a fundamental component for cementing democracy, the rule of law, a functioning market economy and a vibrant rural sector. Countries like Jordan and Morocco ensuring such conditions were granted the advanced status relationship and therefore enjoy preferential dialogue on both trade and development cooperation.

2.3. Past and current EU contribution to the agriculture sector

Several initiatives relevant to the agriculture and food sector have been funded by the ENPI. They fall under the programmes supporting the implementation of the Association Agreement (SAAP) and the ENPI Action Plan (SAPP) and have been implemented through projects using the twinning and TAIEX modalities- (Table 1, 2)

Title of project	Amount M€	Beneficiary	EU Twinning partner
Reform of Food Inspection Services	1.9	Jordan Food and Drug	Denmark
And Food Chain Laboratories		Administration	
Reform of Jordan Veterinary and	1.6	Ministry of Agriculture	UK
Phytosanitory Inspection Services			
Institutional strengthening of the	1.0	Jordan Customs	Italy
Customs Department			
Strengthening of Jordan Institution	1.9	Jordan Institution for	Germany
for Standards and Metrology		Standards and Metrology	
EU Third Country Listing Criteria for	1.0	Ministry of Agriculture	Italy and Poland
Fresh Plants and their Products			

Table 1: Twinning projects in the agriculture sector and related sectors¹⁵

These projects supported the Jordanian institutions in their policies, regulations and administrative capacity to allow a greater liberalization of EU-Jordan reciprocal trade of agricultural products as well as Jordan trade with neighbouring countries and its alignment to international standards.

They contributed to upgrade the Jordan Phytosanitory inspection system and to strengthen the capacity of the national institutions to establish a traceability system for plant and animal products and to improve the field and post-harvest agricultural practices in Jordan. They also supported the

¹⁴ Source: EC, DG Agriculture - International aspects of agriculture development, Background Document for the Advisory Group on International Aspects of Agriculture, January 2012

¹⁵ Source: Ministry of Planning and International Cooperation - <u>http://www.mop.gov.jo/</u>

development and empowerment of a food policy and action plan for a gradual legislative approximation to the EU set of principles and regulations (acquis communautaire) governing Phytosanitory and veterinary services, food and animal traceability and hygiene, quality control on food chain and agricultural residues, thus enhancing the prevention and risk management capacities of the concerned stakeholders. As a result of such projects, Jordan further advanced the preparation of a new food law aiming at approximation with EU rules. Jordan also linked up to the external window of the EU's Rapid Alert System for Food and Feed.

In addition and as a complement to the above twinning projects, the EU mobilized short-term expertise for capacity building activities using the Technical Assistance and Information Exchange (TAIEX) instrument on the following themes (Table 2).

Title of TAIEX Event Dates of	of Execution
Study visit: contingency plans for epidemic animal diseases	September 2008
Expert mission: n-methyl carbamate method of analysis	October 2008
Expert mission: Accreditation of Pesticides Residues laboratory	November 2008
Study visit: Import-Export control measures	November 2008
Expert mission: Surveys and testing of Potato (Brown Rot and Ring Rot) in Jordan	January 2009
Study visit: Laboratory testing of Brown & Ring rot on potato	February 2009
Workshop on EU legislations regarding BSE:	February 2009
Expert mission: Clearance procedures at entry points	March 2009
Workshop: Animal Welfare in Transport & Border Inspection Posts "BIPs	March 2009
Workshop on Decentralized management of Agricultural sector	July 2009
Seminar Food Safety	July 2009
Multicountry workshop on Animal Welfare:	October 2009
Expert mission on veterinary Education Standards	May 2010
Study visit on Biosafety & Biosecurity in laboratories.	May 2010
EU Veterinary week	June 2010
CVO meeting	June 2010
Workshop on marketing strategies to minimize post-harvest losses	September 2010
Workshop on GMO	September 2010
Workshop on Harmonization of Veterinary Education	October 2010
Study visit on EAEVE evaluation of Veterinary education	October 2010
Workshop on Import control on potato seeds	October 2010
Study visit on integrated crop management of pomegranate	October 2010
Study visit on production of fruit trees seedlings	October 2010
Workshop on Food safety	November 2010
Study visit: Veterinary Communication and role in Contingency planning	November 2010
Expert mission on Olive Knot disease	December 2010
Assessment mission on Food Safety	February 2011
Assessment mission on Laboratory Accreditation	March 2011
Study visit: institutional structure of Ministry of agriculture	May 2011
Expert Mission on Meat Safety Inspection at Slaughterhouses	September 2011
Study visit on: Integrated Pest Management of Grape	September 2011
Expert Mission legislative review of organic farming bylaws	October 2011
Workshop on Geographical Indications	October 2011
Workshop on Food Balance Sheets	December 2011
Expert Mission An accreditation from the European Association of Establishments for Veterinary	February 2012
Education (EAEVE) for the Jordanian Faculty of Veterinary Medicine	

Table 2: List of TAIEX activities in the agriculture and food sector¹⁶

¹⁶ Source: <u>http://ec.europa.eu/enlargement/taiex/index_en.htm</u>

2.4. Complementarity with other EU funded programmes

Several initiatives recently approved and under implementation may have strong interaction with agriculture and rural development. It will therefore be important to identify and develop synergies with them in terms of activities, involved stakeholders, target territories and funding mechanisms.

<u>The Water management programme (10 M€)</u>: This programme planned under the NIP 2007-2010 has been recently approved and will start implementation shortly by the Ministry of Water and Irrigation (MWI). Based on past cooperation experience at national and regional levels and considering the key role of improved water resources management for the sustainability of the socio-economic development, the EU will support the efforts for an improved efficiency throughout the whole water cycle and for the multiple usages, including water for agriculture with a focus on use of treated waste water for irrigation of food and non-food crops.

<u>Support for the Implementation of the Action Plan Programme III - SAPP III</u> (13 M€): Like the previous programmes in support to the Association Agreement (SAAP) and to the Action Plan (SAPP), the programme is a demand-driven initiative assisting Jordan in the design and implementation of reforms identified and approved by the Association committee and by the thematic sub-committees in the areas of legal approximation, administrative and institutional adjustments. It is implemented through twinnings¹⁷ and can be tailored to emerging priorities in order to complement other sectorial programmes.

<u>Renewable energy and energy efficiency Programme in Jordan (35 M€)</u>: The sectors where energy efficiency and renewable energy sources can be applied include agriculture and water management. This programme will support the implementation of the 2007-2020 Energy Strategy and the enforcement of the Renewable Energy and Energy Efficiency Temporary Law that was passed in February 2010, which deals with two issues: i) conditions under which electricity generating facilities based on renewable energy can be financed, constructed and connected to the grid, and ii) creation of a Renewable Energy and Energy Efficiency fund (JREEEF).

Support to Research, Technological Development and Innovation in Jordan (5 M€): This project will build up and capitalize on the lessons learnt from the first phase of the project to promote and incentivize applied research in areas that can lead to commercially viable results and to employment opportunities, favouring linkages between higher education, research and productive sectors, networking with European and regional programmes and partners and knowledge transfer to small and medium enterprises (SME). The project may produce relevant results for the agriculture sector as it will focus on the 6 key thematic areas of EU's Framework Programme7: energy, environment (specifically water), food / agro / biotech, health, Information Communication and Nano-technology.

<u>Reinforce and expand the modernization of the services sector in Jordan (15 M€)</u>: This project, implemented by the Ministry of Industry and Trade (MIT) and managed by Jordan Economic Development Corporation (JEDCO) targets the micro, small and medium-sized enterprises that constitute 97% of the economic activity in Jordan and employ up to 60% of the workforce. This project initiated in 2008, although not supporting directly the agriculture production¹⁸, may

¹⁷ A twinning is a peer-to-peer partnership project between similar institutions of the EU and the recipient country successfully introduced in the EU pre-accession policy and now applied in ENP.

¹⁸ A meeting with JEDCO staff clarified that the project can intervene in the agri-business and food processing supporting enterprises and their associations with technical assistance and grants.

provide added value in agricultural and rural value chains¹⁹ where quality services are strongly needed to increase competitiveness on internal and external markets. The project will focus on Governorates outside Amman and could contribute in making rural development strategies more effective and creating business and employment opportunities for more vulnerable groups, including women and youth.

2.5. EU cooperation instruments and aid modalities

The EU has developed a close partnership with Jordan, a country that aims to act as a force of moderation and reform in a region in political turmoil. It is the EU's objective to support Jordan in this endeavour. The relationship emphasizes close cooperation on democratic reform and economic modernization. The current agenda of EU-Jordan relations is spelled out in an <u>Action Plan</u> [83 KB] founder the <u>European Neighbourhood Policy</u>. The legal basis for the EU - Jordan relationship is the <u>Association Agreement</u> [2]. In accordance with current agenda of EU-Jordan relations as described in section 2, the EU aims to assist Jordan in the implementation of its home grown reform process with a diversified set of cooperation tools and implementing modalities in order to increase effectiveness and efficiency of its assistance support towards and in collaboration with multiple stakeholders, including public institutions, private sector and civil society.. The strategy and priorities of the EU's assistance are set out in the <u>Country</u> <u>Strategy Paper</u> [465 KB] [465 KB] [46] [7] and <u>National Indicative Programme</u> [211 KB].

Development aid can be distributed in a number of ways – through specific **projects**, via **a sector approach** or by **budget support** to recipient governments. The Commission follows the project approach in particular to support initiatives outside the public sector, such as through civil society and the private sectors. Projects are also implemented where conditions do not yet permit the adoption a sector approach or a budget support. The Commission, through its <u>Directorate for **Development and Cooperation** (EuropeAid) manages projects in a way that guarantees convergence with EU and partner country policy objectives. In line with aid effectiveness principles, projects must support country-owned policies, must be sustainable and have realistic objectives.</u>

Considering the strategic orientation of EU-Jordan cooperation in the agriculture sector (see section 2.2), Jordan could benefit from enhanced alignment and coherence with EU sector policies, regulations and programmes particularly on <u>Agriculture and rural development</u>, <u>Trade</u>, and <u>regional development</u> and/or others as needs arise.

The ENP Instrument can provide its assistance through diversified funding instruments and aid delivery modalities in the cooperation with partner countries. The European Commission has developed a <u>tool kit</u>²⁰ (Tools and Methods Series) with guidelines for the identification and application of different instruments.

¹⁹ The mission met with a wholesaler and exporter of fruits and vegetables that was recently awarded a grant for the upgrade of its facilities following a Call for Proposals launched by JEDCO under this project

²⁰ Source: http://ec.europa.eu/europeaid/how/delivering-aid/index_en.htm

In terms of decision making processes, we can distinguish programmable aid and nonprogrammable aid. In the first group, the initiatives are a direct translation of the priority objectives defined in the Country Strategy Paper (CSP) and related National Indicative Programmes (NIP). They represent the core of cooperation portfolio and are channelled through the government authorities and partially managed in a decentralized manner by the recipient governments and by the EU Delegation in the country.

In the second group, several thematic programmes can provide financial support for either global programmes or for projects based on Calls for Proposals schemes. In the agriculture and related sectors, Jordan could benefit from the thematic programme for the environment and the sustainable management of natural resources, including energy (ENRTP). ENRTP was adopted on 25 January 2006 to supplement measures in the field of the environment and natural resources (including energy) implemented under national and regional programmes. It includes the opportunity to give priority to measures regarded as world priorities, to cover all the partner countries and benefit both public authorities and non-State actors.

The present mission will primarily address the **programmable aid**, but the second group of instruments should be considered in later phases of implementation together with other thematic programmes supporting good governance and the role of civil society, especially in the area of poverty reduction and rural development.

2.6. Project approach

A project is a series of activities aimed at bringing about clearly specified objectives within a defined time period and with a defined budget. A project should have:

- a) Clearly identified stakeholders, including the primary target group and the final beneficiaries.
- b) Clearly defined coordination, management and financing arrangements.
- c) A monitoring and evaluation system to support performance management.
- d) An appropriate level of financial and economic analysis, which indicates that the project's benefits will exceed its costs.

Project Cycle Management (PCM) is a term used to describe the management activities and decision-making procedures used during the life cycle of a project (including key tasks, roles and responsibilities, key documents and decision options). PCM helps to ensure that projects are supportive of the overarching policy objectives of the European Commission and of development partners; are relevant to an agreed strategy and to the real problems of target groups/beneficiaries; are feasible, meaning that objectives can be realistically achieved within the constraints of the operating environment and capabilities of the implementing agencies; and generate sustainable benefits.

The traditional project approach, based on clearly identified and structured intervention logic (logical framework) and targets (beneficiaries, timing, outputs) and allowing for the delivery of services, works and supplies, has been increasingly diversified with new implementation

modalities according to target groups and project objectives. These may include institutional support and technical assistance under different forms, training of beneficiaries either in the country or through regional and international exchanges and finally direct support to private sector operators using call for proposals (grant) schemes.

2.7. Sector Programme Approach (SPA) 21

The transition towards a programme approach addressing the sector (or part of it) in an integrated manner has been adopted by many donors and in several countries. Compared to the traditional project approach, a SPA is a direct support to the elaboration and/or implementation of national policies, reforms and strategies empowering national stakeholders, strengthening result-oriented planning and implementation as well as coherence between policy, budgets and results and reducing transaction costs. A SPA programme can deliver its support by different means through technical assistance, training and budget support (BS) assuming that he conditions for SBS are fulfilled (see Box 1 below).

Box 1. Eligibility Criteria for Sector Budget Support (SBS)
1. A well-defined sectorial policy is in place or under implementation
2. A credible and relevant programme to improve public financial management is in place/ under implementation.
3. A stability-oriented macroeconomic policy is in place or under implementation.

In addition, the SPA, by strengthening the leadership role of the government, favours the coordination and complementarity between donors and partners, including the leverage of funds into a basket fund dedicated to a specific sector.

2.8. The Sector Policy Support Programme (SPSP)

SPSP is a term used to identify European Commission programmes designed to support a partner government's sector programme. An SPSP may use the following forms of financing:

- a) **Sector budget support** is the preferred modality, wherever appropriate, and consists of a transfer of funds to the partner government national treasury to be used in pursuit of an agreed set of sector outputs and outcomes.
- b) **Common pooled funds** or **common basket funding** (resources from a number of donors pooled using one agreed set of procedures) in support of a specific set of activities in the sector programme. Usually one donor will take responsibility for coordinating and managing the pooled funds. Funds are released by the donor to government according to agreed criteria.
- c) Commission procedures that follow contracting and procurement rules.

The adoption of a SBS requires the preliminary assessment of the key conditions that may influence the performance of such long-term process and the identification of gaps for which technical assistance and capacity building may be provided. Earlier sector approaches were commonly developed in the education and health sectors with the following favourable features highlighted in OECD-DAC review:

²¹ Source: Tools and Methods series – Guidelines N.2: Support to Sector Programmes

- i. Broad consensus between Government and donors on key policy and management issues for the sector.
- ii. A single dominant sector ministry and manageable institutional relationships. Strong and effective leadership at sector ministry has been an important factor in most successful SWAps. Sector programmes have worked most effectively where they are defined in terms of the area of budget responsibility of a single sector ministry. Sector programmes are also often easier to manage where there is a relatively small group of significant donors in the sector.
- iii. An experienced "lead donor" or lead group of donors. Sector programmes usually need a lead donor and preferably a lead group of donors7 willing to support government in managing donor and stakeholder coordination through good advice and through bringing other donors "into line" when necessary.
- iv. Incentives that are compatible with the objectives of a sector approach. A sector approach is more likely to be successful if there are civil service and other government-wide reforms in place to create incentives and performance-related rewards for the stakeholders. This makes it easier to attract staff and to counteract the incentives to retain project bureaucracies. Conversely, problems are likely to occur if the sector strategy involves cutting the budget or cutting staff in the ministry which is to take the lead role in implementing it.

More care is needed in the design and management of a sector approach, especially of some of the above features is absent or weak. The design should also include adjustments showing how much the approach is expected to achieve and how quickly. The adjustments should also take into consideration the lessons learned from other EC's supported thematic and sectorial approaches applied in different region and sectors such as the agriculture and the rural development sectors²².

²² Source: EC Tools and Methods Series, Document No 5 – Sector Approaches in Agriculture and Rural Development

3. COUNTRY CONTEXT

3.1. The Economy

Jordan is a heavily urbanized²³, small, lower to middle-income country with narrow natural resource base and scarce water resources. Jordan's score in the Human Development Index for 2011 is 0.698 ranking 95th of 187 countries, down from 0.760 in 2010.

The major sources of earnings are services (tourism, transport and finance), industry, foreign aid and remittance. For example, the growing industrial sector (e.g. potash, phosphorous, fertilizers, clothing, and pharmaceuticals) collectively generates about 34% of the GDP. The remittance deposited by Jordanians working in foreign countries, especially the Gulf States, represented a very important contribution to the economy²⁴ ranging from 15 to 25% of GDP between 1995- 2009 (US\$ 3.5 billion remittance was received by Jordan in 2009). However, 2011 was a year of challenge to Jordan as a result of the sweeping changes in the Arab region, the global shocks of increasing food and fuel prices, and sharp decline in tourism, remittances and foreign direct investment (-16%, -3% and -32% respectively).

Jordan is among the most foreign aid assisted countries in the world. Its open relationship worldwide and favourable policies attract significant Official Development Assistance (ODA) resources. For example, the amount per capita received between 1998 and 2008 was USD 121 per year which is more than 10 times ODA received by lower middle-income countries²⁵ worldwide^{26,27}. A major share of this support as well as the country's income from services, tourism and industry is directed to effective social benefits in education, health, infrastructure and transport. In spite of this the social stability of the country is threatened by high dependence on foreign labour²⁸, high unemployment rate (national 12.5% in 2011²⁹, 37% youth, and 42% poor in 2004)³⁰, relatively high poverty rates, high dependency ratio and low female participation rate³¹.

Jordan population reached 6.2 million persons in February 2012³² and is expected to reach 10 million by 2050³³. Most of the populations are urban; only 22% live in the rural areas. The social structure of Jordan is complex, and includes about 0.7 million registered Iraqi refugees³⁴. More recently another 100,000 have fled the civil strife in Syria and are located in border refugee

²³ Urban population 79% of total population (2010 est.) at annual rate of 1.6% (2010-2015 est.). Source CIA Factbook ; www.cia.gov/library/publications/the-world-factbook/geos/jo.html

²⁴ El-Sakka Kuwait University; IFAD

²⁵ The WB classified countries according to the GNI per capita . Low income countries are those with GNI less than US\$975.

²⁶ World Development Report , 2010

²⁷ World Development Indicators Database; <u>www.data.worldbank.org</u>

²⁸ Both Foreign and national agricultural labour earn a minimum of 250 JD per month. The labour force is 1.771 million (2011 estimates source CIA Factbook website).

²⁹ CIA Factbook www.cia.gov/library/publications/the-world-factbook/geos/jo/html

³⁰ Unemployment among the youth is between 15-24 years of age is 27% " male 22.6% and females 45.9% Source: CIA Factbook

³¹ IFAD Country Strategic Opportunity Program (COSOP) 2007

³² DOS, 2012, http://www.dos.gov.jo/dos_home_a/main/index.htm

³³ UNFPA State of World Population 2011.

³⁴ UNHCR estimates

camps. About 13% of the Jordanian live below poverty line (2008 estimates)³⁵, inequality is high (the Gini coefficient was 37.7 % in 2006³⁶) and poverty is highest in the rural areas than in the urban areas. The pockets of poverty are mostly rural³⁷; some are in isolated and remote areas while others are in areas with a poor resource base and low population density. Water scarcity, climate change and rising food prices are have major impact on food security in Jordan.

In spite of Jordan's constitution which protects women and ensures their rights of equality³⁸, participation of the Jordanian women in the economic life remains low. For example, women represent only 21% of the economically active population. The chances of the rural women who were traditionally active in family farming and herding activities are threatened by advances in large scale commercial farming and herding.

3.2. Agriculture in the national economy39:

The contribution of agriculture to the GDP in relative terms declined sharply from 40% in the 1950s to less than 4% in 2011^{40} ,⁴¹ while its contribution in absolute terms has increased (e.g. from 32 million JD in 1964 to 560 JD million in 2010 as shown in Table 3⁴².

YEAR	1950s	1964	1974	1984	1994	2004	2010
Contribution in actual terms (%)	15	32	57	98	193	195	560
Contribution in relative terms (Million JD)	40	30	20	6	4.5	3.4	2.9
Total national GDP(Million JD)	15	200	281	1764	4300	8000	18800

Table3: Industrial origin GDP at current prices (Contribution of agriculture to GDP)

In spite of the above increase in absolute monetary terms, the contribution of agriculture to the national economic growth is very modest, which is reflected in the remarkable decline in the sector's share in comparison to other sectors (Figure 1)⁴³. Irrespective of how humble is its economic performance; farming remains economically important and enjoys a respectable

³⁵ Jordan Poverty Report(DOS 2011) based on analysis of 2008 Household survey results

³⁶ Source: <u>http://www.indexmundi.com/facts/indicators/SI.POV.GINI/compare?country=jo</u>

³⁷ Jordan poverty line was estimated as 1.9 JD per person per day (\$2.7). The minimum agriculture wages are about 250 JD per month (or about 8.5 JD per day). It is surprising to note that most of the youth in Jordan are not motivated to earn this available income whereas it attracts large numbers of immigrant workers from Egypt and Syria

³⁸ Source: Jordan Human Resources : <u>www.kinghussein.gov.jo/resources5.html</u>

³⁹ For details please see Section 1.B of this report

⁴⁰ Bahdousheh, M. et al, (2010). Country Case Study-CFS 36th Session 11-14 and 16 October 2010, *National Initiatives for Food Security and Nutrition*, Committee on World Food security.

⁴¹ GDP per capita (PPP) 2011 estimates was US\$5,900

⁴² Source: The central Bank of Jordan , 2011

⁴³ Source MOA (Dr Mahaddin) Directorate of Studies and Polices 2011

agricultural production index (Annex 6)⁴⁴. The importance of the agricultural sector stems from the fact that it is not only the major source of food items especially dairy products, fruits and vegetables (Box 2⁴⁵) and (Table 4), but also one of the sources of hard currencies originated from exports. About 25% of the total poor in Jordan live in the rural areas depending mostly on agriculture (livestock keepers, smallholder farm households and landless former agriculturalists), and in spite of poor motivation of the rural youth, agriculture is an important employer of the rural communities. Also, for cultural, social and environmental considerations and mainly because of its strong forward and backward linkages with other sectors and activities, agriculture remains a very important sector that must be considered in the rural development and poverty reduction plans.

Box 2: Contribution of agriculture to local food consumption needs: For example the gap in selfsufficiency for milk and milk products was reduced from 50% in 1974 to 34% in 2010 mostly as a result of increased number of dairy farms. Also, while poultry products are fully met from the local sources, 38.5% of the national demand for red meat in 2010 was local produced. The contribution of vegetables and fruits to the local needs is very significant. Almost all of the need for vegetables in locally met, and a great part of the consumed fruits are locally produced. On the other hand, these contributions are not supported by competitive farm gate price policies; caused attributed by the Mission of the frustration and un satisfaction of some interviewed farmers

Group	SSR	Production (Tonnes)	Production (Tonnes) Exports (Tonnes)	
Filed crops	4.3	22,125	98	489,639
Vegetables	147.2	1,394,259	617,477	51,988
Fruit Tress	78.8	180,752	8,656	105,497
Olives	102.4	171,672	4,057	0

Table 4: Self-Sufficiency Ratio (SSR) of cereals, vegetables and fruits in 2010

The sector employed about 124,000 people^{46} (2.1% of the total population or about 7.7% of the active labour-force of 1.771 million⁴⁷), and contributed to 17% of total national exports (equivalent to JD 795 million) in 2011⁴⁸ (Annex 7).

Jordan is a food deficit country^{49,50} which is rated as being among the 7 most vulnerable to the impact of high food prices; and among the top four ranking water –poorest nations in the world. The country imports 90% of its cereal requirements, 80% of animal feed requirements, and 42% of its Animal Source Foods (e.g. meat and dairy) requirement. In monetary terms the country

⁴⁴ Source : DOS - Agricultural Production index (of crop and livestock commodities) 1968-2011

⁴⁵ Source MOA compiled by Sidahmed for IFAD Evaluation Mission April 2011, and

⁴⁶ Unconfirmed data indicate that foreign agricultural labour is in the range of 23 to 50% of the labour force while the balance (77 to 50%) are self-employed family labour (See Section 1.B below)

⁴⁷ DOS, 2012, <u>http://www.dos.gov.jo/dos_home_a/main/index.htm</u>

⁴⁸ Source: MOA Directorate of Studies and Policies (2012) - details in Annex 6

⁴⁹The World Trade Organization (WTO) and the Food and Agriculture Organization (FAO) classify Jordan as a net importing country of food and animal feed.

⁵⁰ Jordan produces only 14% of the caloric needs per capita (Department of Statistics . <u>www.dos.gov.jo</u>)



imports three times of what it exports from agricultural products (imports: US\$1.379 billion to exports: US\$563 million). The deficit is exasperated during years of droughts.

Figure 1: National GDP, Employment and Water Use, 2010

Most agriculture products are consumed domestically but cannot satisfy the local demand. The price of most consumed imported wheat is subsidized (Box 3)⁵¹. For example, the country produces only about 5 to 10% of its annual demand for wheat (production 30,000 to 70,000 Tonnes compared to annual consumption of 780,000 Tonnes). The vast majority of the irrigated agricultural production is in the form of fresh fruits and vegetable. Horticultural crops are grown in about 90% of the irrigated areas. The fruits and vegetables produced enjoy a high local demand (e.g. olives and tomatoes). However, they also fetch a significant share of the export market. For example, 52% of total agricultural exports value (or 7.7% of total national export) in 2010 was from horticultural crops.

Box 3: Most imported wheat is subsidized. The annual consumption of unsubsidized wheat (Zero) is 100,000 Tonnes, while the annual consumption of subsidized flour (Unified) is 450,000 Tonnes. Currently, a subsidized Tonnes of wheat costs the government approximately JD280 (USD is equal to .708 JD); the government sells it to bakeries at JD70. Consequently, the total subsidy for wheat during the first nine months of 2010 was JD64 million, compared to JD78 million for the same period in 2009, an 18% reduction in subsidies. It is expected that the size of the wheat subsidy will reach JD140 million in 2011. **Source: WFP 2010**

A major weakness of the Sector is caused by the scarcity of irrigation water and overexploitation of groundwater; use poorly treated brackish and sewage water, land fragmentation and reduction in the size of agricultural holdings; weak extensions services; poor transportation, packaging and processing; infrastructure; unfavourable price policies, and low investment in marketing infrastructure, post-harvest and quality enhancing facilities (grading, packing, storage, etc.). The claim that agriculture consumes 62% of the Jordanian scarce water resources (Figure 1 above) leaving scant reserves for domestic and industrial use is unrealistic and is yet to be proven. However, the claim generally reflects the extent of poor water use practices in agriculture, and points to the need for adopting alternative and modern agricultural practices and techniques.

⁵¹ WFP: The Wheat Supply Chain, 2010

3.3. The competitiveness of Jordan's agriculture sector

For a large number of small farmers and herders in Jordan agriculture is a means of livelihoods practiced under unreliable environment, scarce water resources, limited coping strategy and low/ no basis for commercial stability. The competitiveness of the agriculture sector is further challenged by: (i) poor access to technology, markets and rural financing; (ii) high input prices; (iii) unfavourable tax rates and tax laws, and; (iv) over-reliance on increasingly expensive public service providers. For example, the total average annual budget of MOA is approximately equally divided between current (Salaries and Administrative) and capital (investment) expenditure. Whereas the cost of the Administration Department increased by 46% between 2008 and 2012, the investment costs declined by 26% (Table5)⁵². The overall spending trend by all MOA departments also reflected an increase of 61% in salaries and administration cost and a decrease of 27 % in the investment budget during the same period. Obviously the increase in the salaries reflects a burden on the investment resources. This may suggest that most of the investment expenses could be offered a competitive way through lean private and semi-private farmers' companies (e.g. commercially established small and medium sized Farmers' Organisations (FOs). These commercially organised FOs (agricultural producers) should also purchase the cost of services (extension, vaccination, plant and animal diagnostic laboratories, food hygiene, and farmers' training, etc.) from public or private service providers from the profits gained after the sale of the products or on direct cost recovery basis.

Year	20	08	20	10	20	11	20	12
Expenditure	Current	Capital	Current	Capital	Current	Capital	Current	Capital
Administration	9.46	7.98	12.31	5.89	13.54	3.36	14.52	5.90
livestock & Veterinary	2.13	3.88	2,66	3.36	2.93	2.54	3.38	2.54
Forests and Pastures	1.88	6.22	2.55	4.50	3.82	4.08	3.48	4.19
Plant Production &					3.40	3.70		
Protection	1.82	3.73	2.51	2.33			3.67	1.59
Land Reclaiming	0.53	2.26	0.75	2.93	0.86	5.28	0.84	3.12
Research & Extension	3.48	2.66	4.74	1.93	5.23	2.55	5.22	1.88
Total	19.30	26.73	25.53	20.94	29.78	21.46	31.09	19.51

Table 5: Spending by the MOA on agriculture and sub sectors (2008, 2010, 2011 and 2012) in million JD

Source: MOA 2011

⁵² Source: MOA 2011 and discussions with the Focal Point Committee and Mission in 2012

4. SECTOR OVERVIEWS

4.1. Biophysical and Environmental Status that Impact on the Agricultural Sector

4.1.1 Climate

Jordan is a semi-arid and drought-prone country largely influenced by the range of mountains in the West. The western part of Jordan, or the Highlands, has a Mediterranean climate characterized by a hot, dry summer and a cool, wet winter separated by two short transitional periods. The southern and eastern parts of the country are arid with hot dry summers and cold dry winters. The temperature increases towards the south, with the exception of some southern highlands.

Precipitation is characterized by extreme variability and is confined largely to the winter and early spring seasons and ranges from over 500 mm in the highlands to less than 50 mm in the east. The long-term average annual precipitation is 8,500 million cubic meters of which about 92.5% is lost to evaporation. The Eastern Desert (also known as the Badia) has an average rainfall of 50 mm per year and which lies east of the Mountainous Region and covers 80 % of the land area of Jordan. This region is characterized by a dry, hot climate. ^{53, 54}

The Jordan Valley (Figure 2) forms a narrow climatic zone that annually receives up to 300 mm of rain in the north and less than 120 mm at the northern edge of the Dead Sea.



Figure 2: Mean annual rainfall and potential evaporation in Jordan. (RJG JNGC, 1984)

⁵³ Meteorology Department, 1988. Jordan Climatology Handbook. Amman: Meteorological Department. 90 pp.

⁵⁴ Freiwan, M. et al., 2007, Climate variability in Jordan. International Journal of Climatology

4.1.2 Agricultural Ecological zones (AEZs)

Jordan consists of 5 Agro-ecological zones (Table 6) distributed over a total land area of 89,200 km2. The land surface is dominated by vast areas of desert and semi-desert ecosystems in the east and south-east. The mountains are limited to the highlands of the north, west and south west. The diversity permits diversification of crops and seasonal distribution of production. A detailed distribution of agro-ecological zones is shown in Figure 3

Agro-ecological Zone*	<u>Annual rain (mm)</u>	<u>Area/ Ha (m).</u>	<u>Area (%)</u>
Arid	<u><200</u>	<u>8.028</u>	<u>90</u>
Marginal Zone	<u>200-300</u>	<u>0.5619</u>	<u>6.3</u>
Semiarid	<u>300-500</u>	<u>0.1338</u>	<u>1.5</u>
Sub humid	<u>500-800</u>	<u>0.09812</u>	<u>1.1</u>
Jordan valley	<u>200-350</u>	<u>0.09812</u>	<u>1.1</u>
<u>Total</u>		8.92	100

Table 6: Jordan	Agro-ecological	zones. rain	and land-use ⁵⁵
rable of solution	ABIO COOLOBICAL	201100, 10111	

Badia <100 mm rain 82% of land mass, Steppe 100-200 mm 11% of land mass; Highlands >200 mm rainfall 2.55 of land mass,. Vegetables (mostly tomatoes, cucumbers, aubergines, cauliflower, cabbages); Fruits (mostly citrus fruit and bananas, melons and grapes)



Figure 3: Agro-climatic zones in Jordan

⁵⁵ MOA 2011 Compiled by Sidahmed for IFAD Evaluation Mission April 2011

4.1.3 Soils

<u>Highlands</u> are non-cracking soils, cracking clayey soils and shallow loamy soils. The soils are generally calcareous with fair nutrient level but suffer from nitrogen and phosphorous deficiency and occasionally iron and manganese deficiency. The organic content is less than one %. The texture is heavy loam to clayey with high water holding capacity.

<u>Steppe region</u> (marginal areas) soils are deep to moderately deep, slightly gravely, with fine siltloam texture in the surface and subsoil horizons. The subsoil horizons are rich in $CaCO_3$. The surface layer is dark, yellowish brown to brown. The high silt content of the surface soil and the absence of suitable organic content are responsible for the poor infiltration rate that leads to higher run-off and decreases the water storage capacity of the soil profile. Consequently, the vegetative growth is retarded and further soil degradation occurs. In general the soils suffer from deficiencies of nitrogen and phosphorous, and are highly susceptible to gully and wind erosion particularly when disturbed by ploughing or subjected to over grazing.

<u>Jordan Valley and Wadi Araba</u>. The soils belong to the order entisols (weakly-developed soils). In the north of the Valley, the soils are deep and of moderate to medium structure. These soils have good water holding capacity and are relatively fertile.

<u>The Desert region</u>. The soil depth varies considerably from one place to another. In the basalt area in the north, the deep clay, well structured, soils occur below the moderately weathered basalt pavement. Recent soils are saline, rather silty due to the effect of wind sediments or are like the soils which occupy the mudflats. Older soils are clayey, deep, and contain higher amounts of CaCO₃. In the middle of Badia and to the south of Azraq, the soils become saline and contain gypsum. In the south around Disi and Mudawwara, the weathered sandstones shale and granite have resulted in the formation of sandy soils. The soils are in general low in organic matter, sandy to sandy loam in texture, often highly saline or alkaline and are generally devoid of vegetation. Their water holding capacity and fertility status is very low⁵⁶.

4.1.4 Topography

Jordan covers an area of 89,800 km2 with varied topography including a range of mountains that runs from north to south with altitudes ranging from 500 meters to over 1 700 meters, which form the Highlands. East of the mountain, the land slopes gently to the east to form the eastern deserts. In the west, the land slopes steeply towards the Jordan Rift Valley, which extends from Lake Tiberius in the north (elev. 220 m below the sea level) to the Red Sea at Aqaba. The Dead Sea lies about 120 km south of Lake Tiberius, with water level at about 405 m below the sea level.

The following are the four main physiographic regions in the country57:

- Jordan rift Valley. The rift valley extends from Lake Tiberius in the north to the Gulf of Aqaba in the south. The Jordan rift Valley is the most important agricultural area, as there is a permanent source of water from the Yarmouk River and side dams. Due to its position below sea level and high temperatures (microclimate), the area is the most important winter vegetable producing areas. Farmers use modern agricultural techniques in irrigation and production (Box4).

⁵⁶ Al-Qudah,2000.Soils of Jordan

⁵⁷ Abu Sharar, 2006. The challenges of land and water resources degradation in Jordan.

Box 4. The Jordan Rift Valley (Al-Ghor) is an elongated depression located in Jordan and the Palestinian territories. This geographic region includes the Jordan River, Jordan Valley, Lake Tiberius and the Dead Sea. The valley continues to the Red Sea, incorporating Wadi Araba and the shorelines of the Gulf of Agaba.

- The Highlands extend from the Yarmouk River in the north passing through the Ajloun Mountains, the hills of Madaba, Karak Sharah Mountains. Many creeks and wadis drain from the east to the Jordan River, Dead Sea, and Wadi Araba. The average altitude ranges from 600 m in the north to 1,000 m in the middle and 1,500 m in the south. The highlands, which are a succession of catchment and sub-catchments, comprise: a semi-arid zone (350-500 mm annual rainfall) and a small sub-humid zone (over 500 mm annual rainfall).
- *The Arid Zone (Plains)* comprises the plains between the Badia (semi desert) and the Highlands. Rainfall ranges between 200 mm in the East and 350 mm in the West. More than 50 % of the arable land is in this zone, the rainfed crops are mainly barley (areas of 200-300 mm of rainfall) wheat and fruit trees (where rainfall ranges between 300 and 350 mm).
- Badia (Eastern Desert) covers about 90 % of the country. It is characterized by a very sparse vegetation cover and an annual rainfall of less than 200 mm. In the past it was only used for grazing. In the last two decades, however, 20 000 ha have been irrigated, using underground water, to grow vegetables (especially tomatoes, watermelon and potatoes), plus fruit trees and cereals, especially wheat.

4.1.5 Water resources

Surface water is the main water resource in Jordan and is distributed over 15 surface water basins. Ten dams have been constructed with a total capacity of 325 million cubic meters⁵⁸. Water resources are extremely scarce and fluctuating with a total annual renewable amount of about 789 million cubic meters), out of which 505 million cubic meters from surface water and 275 million cubic meters from groundwater resources. Non-renewable groundwater resources are estimated at 240 million cubic meters per year in Disi and Jafr Basins. Groundwater makes 70% of potable water in Jordan and groundwater aquifers were over pumped by about 61.1 million cubic meters in 2006 which led to severe drawdown in the groundwater level.

The annual supply of surface water is 214.69 million cubic meters, with the Jordan Rift Valley contributing 108 million cubic meters. Springs account for 57.2 million cubic meters and base flows and floods account for 49.4 million cubic meters. Most of the surface water (73.5%) is allocated for agricultural activity, with about 152 million cubic meters allocated for the purpose of irrigation. Most surface water used for irrigation is used in the Jordan Valley.

⁵⁸ MWI, 2008. Ministry of Water and Irrigation, Jordan's water strategy, 2008



Treated water

In addition, all treated waste water for irrigation purposes is mixed with fresh water to ensure dilution of pollutants from the treated water. The total quantity of treated water is about 78 million cubic meters.

Jordan's groundwater is distributed among 12 major basins (figure4). Total internally produced renewable groundwater resources have been estimated at 500 million cubic meters/year, of which 220 million cubic meters constitute the base flow of the rivers. Groundwater resources are concentrated mainly in the Yarmouk, Amman-Zarqa and Dead Sea basins. The safe yield of renewable groundwater resources is estimated at 275 million cubic meters/year. Most of it is at present exploited at maximum capacity, in some cases beyond safe yield. Over-extraction of groundwater resources has degraded water quality and reduced exploitable quantities, resulting in the abandonment of many municipal and irrigation water well fields, such as in the area of Dhuleil⁵⁹.

⁵⁹ BGR,2004, Assessment of groundwater safe yield, 2004; BGR,2010 Groundwater Resources Management 2010



Figure 4: Groundwater basins in Jordan and their estimated safe yields, (BGR, 2004)

4.1.6 Forest resources

Jordan has limited forest resources, with about 1 per cent of the country classified as forests⁶⁰. The forests in Jordan are generally neither productive nor capable of producing good quality wood for commercial or industrial purposes (i.e., they have low commercial value). However, they provide other kinds of important services, including contribution to soil conservation, watershed management, aesthetic and recreational value, biodiversity conservation and carbon fixing. Forests in Jordan consist of natural and man-made forests including windbreaks and shelterbelts. Natural forests constitute only 0.44 % of Jordan's total land area (50 800 ha). Of these, over half are considered to be degraded defined as having a very poor density of less than 20 % and very limited capacity to regenerate.

Planted forests established on public lands cover an estimated 45 000 ha. Forests are located where rainfall is above 200 mm, mostly in the northwest areas (e.g. Jarash and Ajloun), Amman area and some areas in the south. Forests occupy between 20 to 30% of the land area in these Governorates, and play an important environmental role in protecting watersheds and in

⁶⁰ FAO, 2010 FAO. 2010. Global forest resources assessment country report- Jordan; www.fao.org/docrep/013/al541E/al541e.pdf

supporting tourism. Most of the forests are in government owned areas. The main factors contributing to low forest cover and diversity are habitat encroachment by urban and agricultural development, deforestation, and deterioration of rangelands by over-grazing and soil erosion.

Forests in Jordan play only a modest role in meeting the needs for timber products. Nevertheless, they play a more important role in supporting some other economic sectors. The existing limited industry produces Firewood, Furniture, and fruit boxes and some of the non-wood forest products (NWFPs) e.g. mushrooms, wild fruits, aromatic and medicinal plants. In addition, forestland produces large amounts of fodder from the annual and perennial plants⁶¹.

4.1.7 Land use (farming, grazing, ecotourism)

Land use/cover and agro-climatological maps show that 90% of rainfed agriculture is taking place in the northern and western highlands⁶²(Figure5). Irrigation is taking place in JV, highlands and desert areas. Although the eastern and western arid lands and desserts are used as open rangelands, however irrigation is practiced in these hot areas.

⁶¹ Ouran, 2010. An analytical report prepared by Indufor for the United Nations Forum on Forests Country Case Study: Jordan.

⁶² Bakri and Khresat ,2011. Land Use/cover changes in Jordan, unpublished paper.



Figure 5: Map of existing land use/cover of Jordan.

The agricultural sector is about equally shared by two subsectors: 55% livestock production and 45% cropping. About 4.7% (4.20 million du) of the land surface is considered cultivable land of which 25% is under irrigation and 75% rainfed. The most fertile and productive agricultural areas are in the Jordan Rift Valley in the west part of the country, mainly based on marginal water resources, whereas irrigation in the highlands is based on groundwater. The predominantly rainfed highlands mainly produce wheat, barley, in addition to olives, grapes, almond and other fruits.
The land use changes in rainfed agriculture are mainly due to the land fragmentation and urban encroachment in agricultural areas. Under these conditions, field and mainly grain/cereal crops, have become less profitable and their management (e.g. tillage operations) more difficult with shrinking farm holding size. In addition to the previously mentioned factors, in many of the country's semi-arid areas, population growth is driving people to cultivate fragile steppe areas not previously used for farming due to their inherent low productivity.

4.1.8 The rangeland (Badia) resources

The Badia Rangelands occupy 82% of the land mass. The highest productive areas are located in the 100-250 mm rainfall zones (steppe grassland and brush). The overall contribution of the grazing areas to animal feeding in Jordan has declined from 85% in the 1950s to less than 10% in present time. Currently range vegetation provides between 90 days and zero days of supplemental grazing each year to Badia livestock depending on the location and the rainfall. Grazing is performed twice: in the spring and in the autumn.

Commercialized production systems have greatly replaced the communal and livelihood practices. Also because communal lands are considered by law as government property where the legal right rests with the GOJ, the loss of effective tribal rights/fronts (insignificance of the meaning of Wajihat Al Ashaeryia) have progressively caused deterioration of the traditional conservation practices (e.g. Hima). Furthermore, the practice of granting the state claimed lands (Miri) for use according to GOJ discretion has, at times, marginalized the majority of the Badia dwellers giving preference to the well off and the commercial investors. Rehabilitation and restoration of the rangeland resources is currently being planned under the UNCC supported USD 160 million Badia Ecosystem Restoration Program (BRP). The approach involves a wide range of options to develop the major Badia watersheds such as (i) community development; (ii) restoration and development of the biophysical resources; (iii) range livestock development, and; (iv) rural financing (RF) for alternative income generation activities (AIGA).

4.1.9 Livestock

Sheep and goats are the most important livestock breeds raised in Jordan. About 57% of the small ruminants are raised in the Northern Jordan, 27% in the Center and 16% in the South (*Source: www.g77.org/finalrpt*). Sheep and Goat numbers fluctuated from 2.4 million in 1996 to 3.2 million in 2011 with lowest population of 1.9 million recorded in 2002⁶³. In 1997 the mobile (nomadic) herders were estimated as 11% of all Badia herding families and the majority was moving towards sedentarisation. Although the number of small ruminants has increased slightly over the years, the number of livestock producers has been declining indicating an increase in large scale commercial operations and movement of ,000s of small herders out of their traditional livelihood occupation. For example, the number of sheep and goat keepers was reduced from 29,650 families in 2010 to 25,469 in 2011.

⁶³ MOA compiled by Sidahmed from various MOA reports for IFAD Evaluation Mission April 2011).



4.1.10 Dairy farming

The entire dairy is raised under the commercial systems, fully dependent on concentrate feeds (maize, barley, soybeans, and wheat bran). Animals are also fed on wheat straw and alfalfa hay. Fresh alfalfa bought by dairy farmers is grown with (high quality) reused treated water. Feeding systems are more developed in the large farms than the average-sized farms, where total mixed rations and advanced feeding programs are applied. Small-scale production systems exist in different regions in the country, particularly in the northern highlands, and the Jordan Valley (*Ghor* region). Dairy farmers in the high lands have been rearing cows a long time ago using local breeds. There are no exact figures on the number of dairy farms in this system as the government usually neglects this category of farmers, focusing on the large scale production systems. Farm size fluctuates from 1 to 10 dairy cows. During the last two decades, farmers have replaced their local cows with high yielding Holstein Friesian due to its high productivity⁶⁴. Small-scale production systems in the Jordan Valley region are slightly different from dairy farming in the highland. The dairy in the Jordan Valley region is fed from fodder (e.g. alfalfa) and grain crops grown under irrigation in quantities and quality that meets the nutritional demands of the well advanced Local and Holstein-Friesian cows⁶⁵.

⁶⁴ MOA 2007 Ministry of Agriculture. Department of Dairy Production. Annual report. Jordan.

⁶⁵ AOAD 2003 Arab Organization for Agricultural Development. Report on the Development of Dairy Products, Production, Processing, and Marketing for Small-Scale Dairy Farmers. http://www.aoad.org/eng/Publications.html

The dairy sector in Jordan has encountered several problems in feeding and management. There is an absence of a clear farm gate pricing strategy, unbalanced feed rations and scarcity of feed resources especially as zero grazing production systems are dominant⁶⁶. Milk production cost is high due to the high feed prices. Shifting part of dairy farming to areas where at least part of the feed could be grown would be helpful to improve feeding systems, which are currently used. In addition, establishing a modern dairy factory by the dairy breeders association could be a successful venture and a means to open new markets and to break the monopoly of the big dairy factories.

4.1.11 Ecotourism

Tourism is one of the largest export segments contributing about 10% of GDP, and is the second biggest private sector employer (over 90,000 people employed in 2010)⁶⁷. Ecotourism is the largest growing tourism niche worldwide. It works best when coupled with other forms of economic activity, such as linking with local villages to incite revenue-generating projects. In this case, economic returns are high.

Nature reserves are still limited, and sustainable tourism is not practiced widely in Jordan. One of the initiatives taking place, in order to ensure that tourism is handled in a sustainable manner, is the UNESCO's Man and Biosphere Programme (MAB). Dana Biosphere Reserve is first MAB reserve established in 1993. In June 2011, Wadi Mujeb was declared as the second MAB reserve. Also, in June 2011 UNESCO agreed to inscribe Wadi Rum in the global list of World Heritage Sites as the only mixed natural-cultural heritage site in the Arab world.

Eco-tourism facilities and activities have been created in four protected areas so far: Dana, Mujib, Ajloun and Azraq. These areas have widely different habitats and landscapes, from rugged mountains to Mediterranean forest and desert wetlands. The eco-tourism sites and operations being developed by RSCN (Royal Society for Conservation of Nature) are making a significant contribution to the development of Jordan's tourism industry. In 2007, the number of tourists to RSCN sites exceeded 40,000 and the revenue generated contributed over 45% of annual conservation costs and supported hundreds of local community jobs. The private sector is now developing new eco-tourism facilities and operations in other areas of Jordan, including Wadi Rum.

4.1.12 Farming systems

a) Irrigated agriculture (Insert Image)

Irrigated agriculture is taking place in the Jordan Valley and the highlands. The main source for irrigation in highlands is the ground water. In northern Jordan Valley (JV), the area under cultivation is served by surface water supplies transported via the King Abdullah Canal (KAC) from Yarmouk River while the irrigation water to the middle and southern parts of Jordan Valley

⁶⁶ Harb M Y 2008 Feedstuff production and deficit in Jordan. Proceedings of the regional workshop on livestock production and development. The University of Jordan, Amman, Jordan.

⁶⁷ Meeting with RSCN Nature reserves director

are mainly served by water coming from King Talal Dam (KTD) on Zarqa River after mixing with that coming from KAC. Currently, a transporter will deliver the water from KTD to the northern JV. An average of 259, 000 du was cultivated in 2010, of which 102, 000 du 39% were irrigated (<u>www.DOS.gov.jo</u>)⁶⁸. About 40,000 du are irrigated in the southern desert (Disi-Mudawara) and Aqaba governorate. The irrigated area in the western and eastern deserts is limited to Mafraq governorate and Azraq area. The total irrigated area in Mafraq is about 100,000 du of vegetables and 50,000 du of fruit trees, while the total irrigated area in Azraq of both fruit trees and vegetables is 50,000 du. (Table 7)



	Production (0	000 Tonnes)		Cultivated Ares (00 du)		
	JV	Highland	Jordan Total	VL	Highland	Total JV
Field Crops	45	272	318	33	1,252	1,286
Vegetables-W	660	272	932	149	83	232
Vegetables-S	138	720	858	48	201	249
Total Vegetables	798	992	1,790	197	284	481
Fruit Tress	182	278	460	107	721	827
Total	1,026	1,542	2,568	337	2,257	2,594

The capital-intensive, irrigated farms are in the Jordan Valley and the southern Ghors produce fruits and vegetables for the local market and for export.

⁶⁸ DOS 2010 Agriculture Survey Data

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b) Rainfed agriculture

Generally, rainfall amounts and climatic conditions of the country do not support good rainfed agriculture, except for few areas in the northern and western highlands. Therefore, the rainfed agricultural zone is lying in areas where rainfall exceeds250 mm, although significant production of cereals does occur in some areas where rainfall is between 200 and 250mm.

There are three main sub-divisions within the rainfed sector, namely fruit trees, field crops and to less extent the vegetables. Fruit tree crops dominate the hilly and steep sloping lands of the western part of the highland plateau (e.g. western parts of both Yarmouk and Zarqa basins). Slopes are generally too steep for cereal and other annual crop production even with soil conservation measures. However, wheat is grown on inappropriately steep slopes in some places. There has been significant expansion of the area planted to tree crops, especially olives, and this is a trend which has been encouraged by Government under projects such as the Zarqa Basin Project and Highland Development Project. On the undulating lands of the major plains of Irbid, Madaba, Karak, Tafila and Shoubak wheat is the major crop, with lesser areas of tobacco, "broom" sorghum and other summer crops of lentil and chickpea (STR., 2011). The main threat to rainfed cultivation in Jordan is urban expansion and land fragmentation, in addition to the frequent droughts.

Between 1992 and 2010, rainfed areas declined from 260,000 du to157, 000 du reflecting deterioration beyond the unusual rainfall fluctuations (+/- 50,000 du/year). Also the area planted in annual field crops (cereals, tobacco, and vegetables) appears to be shrinking from 72 % to less than 65 % of this same period of time⁶⁹.

This decrease might be attributed to; first, the continuous division of land, expansion of urban areas, and pooled ownership are commonly cited as deterrent to grain development. The expansion of the urban areas were at the expense of the traditionally field crops lands in Irbid, Madaba and Karak Governorates. Second, the active encouragement by the Government to replace the grains by fruit trees in the hilly areas within a soil conservation scheme for economic as well as ecological considerations. Third, the farm structure is dominated by small holdings where the rainfall exceeds 250 mm and where most of the arable land has a slope more than 9%, and the net return per du is quite low. Thus, the field crops area is pushed to the marginal areas where the effects of climate change is the highest. Therefore, the prospects for increasing cereal production are very limited.

c) Olive trees Farming(Insert Image)

There are about 15 million olive trees grown in Jordan. About 1 million trees of good varieties for producing high organoleptic quality are planted annually. The area covered with olive trees in rainfed areas is about 85,000 du. They are distributed over relatively small farms using traditional farming techniques and minimal use of chemicals⁷⁰. The area of olive trees under irrigation is about 25, 000 du. Many olive farming projects under irrigation have failed because of water scarcity such as in Disi area in the south eastern region of the country, and sometimes because of poor water quality such as in Azraq region in the eastern Badia.

⁶⁹ DOS, 2010, Agriculture Survey data

⁷⁰ http://www.competitiveness.gov.jo/files/olive.pdf

d) Bee keeping

The sub-sector is minor but with potential for expansion pending expansion in the restoration of the natural resources ecosystems and biodiversity. At present the commodity sub-sector produces about 35 Tonnes each year and supports 3000 beekeepers of which 85% are poor low income producers. The two main honey-flows occur in the spring, one coming from the Jordan Valley citrus trees, and the other from the mountainous areas. The average domestic consumption reached 379 Tonnes per year.⁷¹.

e) Medicinal herbs and aromatic plants (MHAP)

MHAP possess higher water use efficiency, relatively higher economic returns per unit area compared to conventional crops, and the potential to add value through processing and marketing. Utilizing the unique climate and diverse agro-ecosystems of Jordan allows production of MHAP on large and small-scales across all seasons of the year. Production and export of fresh herbs is very feasible in Jordan. Fresh herbs can be produced around the year in Jordan due to the multiple eco-systems in the country but particularly because of warm conditions in the Jordan Valley during the winter. The crops traded in local markets are: – mint, parsley, sage, oregano, fennel, purslane and coriander are the most prevalent. The demand for fresh herbs is generally increasing. The amount of herbs marketed reached 15,000 Tonnes in 2004⁷².



⁷¹ Source Dr Nizar Jamal Haddad NCARE (2012)

⁷² Source Dr. Kamal Khairallah, Fresh Cut Herbs for Export in Jordan.2006

f) Field Crops:

Field crops accounted for 39% of the total cultivated area, but only 8% of total production in 2007. In 2007, 85% of the cropped area was under wheat and barley, 4% under fodder crops and 11% under chick peas, lentils and other field crops

g) Vegetable Production (Insert image)

Vegetables were produced in about 16% of the total cultivated area in the period 1995. The %age increased to 18% of the cultivated land in 2009. The main vegetables produced were tomatoes, cucumber, potatoes, eggplant and melon. Together, these vegetables accounted for 71% of the total production in 2007. The production index for vegetables increased from 105 in 2004 to 126 in 2010 (2007=100).

h) Fruit Production

Fruit trees accounted for 40% of the total cultivated area in the period 2005-09. In 2007, 71% of the tree crop area was under olive trees (84% in the rainfed area), 8% under citrus (65% in the Jordan valley), and 4% for grapes, 3% for pome fruits and 6% for almonds. Considering the soil, topography and climate conditions, fruit trees have the greatest potential to be developed. Over the past five decades, substantial investments have been made in fruit trees in the highlands. The production of olives is highly variable, with a good crop every other year. Thus, the production index for olives was calculated on the basis of the average of two sequence years.

i) Livestock systems

More than half of the agricultural holders were found to keep animals (DOS, 1999). Animal production accounted for 55% of the agricultural gross domestic product in 2006 (MOA, 2007). Sheep and goats are raised in Jordan for multiple purposes; milk products, meat, wool, hair and hides, while cows are raised for milk production. The number of sheep and goats was 3.751 million heads in 1991, 2.821 million heads in 2007. The number of cows was 64, 000 heads in 1991, and 81, 000 heads in 2007 (DOS, 2007). Poultry meat production was about 120, 000 Tonnes in 1997 and 180, 000 Tonnes in 2007. Egg production was 715 million eggs in 195 and 800 million eggs in 2008 (DOS, 2008).

Sheep and Goat

The feed concentrate has generally been distributed to flock owners on an untargeted per head of livestock basis. The annual subsidy of barley during the period (1990-1995) averaged \$15.4 million, which increased to about \$51 million in 2005, and jumped to \$134 million in 2007. The government paid a subsidy of \$100-130 Tonnes-1, which is the difference between government purchasing price and the farmer's subsidized price (Ministry of Industry and Trade, 2008). The price subsidy increased the total number of sheep from 1.2 million head in 1988 to about 2.5 million head in 1995. The feedstuff subsidy removal during the period (1997-2000) which was accompanied by a severe drought in (1998-2000) accelerated the decrease of the flock size which reached the minimum of (1.6 million head) in 2000. After the re-introduction of feed subsidy, the sheep flock size started to increase from 1.66 million head in 2001 to 2.92 million head in 2010. In January 2012, the government set the subsidy price of barley for farmers in rural areas with 175 JD/Tonnes. (246 US\$/Tonnes). Whereas the free price for commercial breeding companies where set to (245 JD/Tonnes).

The feed has generally been distributed to flock owners on an untargeted per head of livestock basis. The annual subsidy of barley during the period (1990-1995) averaged \$15.4 million, increased to about \$51 million in 2005, and to \$62 million in 2006 while it jumped to \$134 million in 2007. The government paid a subsidy of \$130 Tonnes-1, which is the difference between government purchasing price and the farmer's subsidized price. The price subsidy increased the total number of sheep from 1.2 million head in 1988 to about 2.5 million head in 1995. The feedstuff subsidy removal during the period (1997-2000) accompanied with a severe drought in (1998-2001) accelerated the decrease of the flock size which reached the minimum (1.6 million head) in 2000. After the re-introduction of feed subsidy, the flock size started to increase from 1.66 million head in 2001 to 2.41 million head in 2007. The value of imported barley increased from \$44 million in 2000 to \$251 million in 2007. Therefore, the policy of subsidizing prices for imported livestock feed has encouraged livestock herders to keep large numbers of animals that exceed the carrying capacity of the rangeland

4.1.13 Land tenure:

Land can be owned individually or by groups in Jordan <u>(USAID 2007)</u>. The state claims ownership over all uncultivated or unbuilt-upon land, including pastoral areas. The classifications of land tenure include: (1) owned land (mulk); (2) communal land held by peasant farmers and periodically redistributed (musha'a); (3) religious land (waqf); and (4) state land, which can be granted in use rights to the public (miri)⁷³.

Land rights⁷⁴ played an important role in determining the level of ownership size in Jordan. Large part of the Jordanian land was allocated to land rights during the Ottoman years which ended in 1918. As a consequence the agricultural land has suffered from large land

⁷³ USAID 2007, Land tenure and property rights regional report, VOLUME 2.5: Near East Asia and North Africa.

⁷⁴ Taimeh 2011, Country Study on Status of Land Tenure, Land Management and Land Use Planning in SNO Countries, FAO Near East regional office.

fragmentation. The only part that is not very segmented is the one in the Jordan Valley (JV) where the land size was controlled by JV developmental law in 1988, which did not allow land division below specific size (3 to 4 du).

The total land area has decreased from 3.9 million du in 1975 du to 2.6 million du in 2007 as shown in (Table 8). This decrease can be considered as negative indicator. This happened due to expansion in urban area on the account of agricultural area. On the other hand, number of holdings has been increased from 50.7 thousand in 1975 to 64.3 thousand in 2007. This reveals the high rate land fragmentation and the reduction in the size of the agricultural holding and the increase in the agricultural holders⁷⁵.

	1975 (census	2007 census		
	% of Holding		% of Holding		
Holding size categories in Du	No.	% of Area	No.	% of Area	
< 10	24.3	1.1	37.3	3.5	
10-29	24.2	5.5	28.1	8.7	
30-49	15	7.1	11	7.2	
50-99	17	14.6	8.3	9.1	
100-199	10.8	18	3.7	8.8	
> 200	8.7	53.7	11.6	62.7	
Total	100	100	100	100	
No of Holding	50,	791	64,613		
Areas of Holding	3,904	4,031	2,584,229		
Average Holding size	77 40			0	

Table 8: %age Distribution of Horticultural Holding Number and Areas according to agricultural censuses 1975-2007

 $^{^{\}rm 75}$ DOS reports for the years, 1975,1983,1997, and 2007

4.2. SOCIO-ECONOMIC FEATURES INFLUENCING THE AGRICULTURE SECTOR

4.2.1 Jordan population

Growing populations, increasing urbanization, increasing economic development, and rising standards of living all ultimately have a variety of environmental impacts on agricultural sector. Such impacts include loss of productive land, particularly in urban areas, degradation of, water resources, deforestation, and desertification.

The first population count conducted in 1922 showed that the total population was 235,000 people. A total population in 2011 is estimated 6.2 million⁷⁶. The forecasted population is expected to reach 10 million in 2050 assuming a medium declining population growth rate scenario. Population Growth in Jordan

4.2.2 Population Pyramid

The age-sex distribution of the Jordanian population shows a typical wide-based pyramid, characterizing the age structure as that of a young population. The proportion of the working-age group (15-64) has been increasing since 1980, where it rose from 47.7 % to reach 58.6 % in 2010. The proportion of the elderly (65+) population rose from 3.5 % in 1980 to 3.9 % in 2010

Rapid development in the provision of health care services led to a decline in the crude death rate. The lowered death rate, a high birth rate, and lowered infant mortality rate combined to generate a major demographic pressure. More than 37 % of the Jordan's population is below fifteen years of age. This situation strained the country's already limited resources, and employment for the burgeoning group of young people became increasingly difficult to provide.

4.2.3 Distributions of population among governorates

More than two thirds of the population lives in the main urban areas, of which 39 % live in Amman (the capital), 18 % live in Irbid and 15 % live in Zarqa⁷⁷ as shown in Figure 6, 7. Rapid urbanization appeared to be the result of a high fertility rate and rural-urban migration.

If urbanization continued at the current rate, it is estimated that by the year 2030, nearly 3.5 million of the population could be living in Amman. The remainder of the population resides in villages scattered in an uneven pattern throughout Jordan. The nomadic and seminomadic population is very small, at most 2 to 3 % of the population. The clearest concentrations of villages were in the fertile northwest corner of Jordan and the Jordan Valley. Village size varied markedly from region to region

Disease and malnutrition problems appear to be as serious in rural areas as they are in urban areas, especially among the poor. Furthermore, the number of people living in urban areas is doubling every 20 years, creating major environmental problems, including water and air pollution and increased disease and food shortages.

⁷⁶ DOS, 2012. <u>http://www.dos.gov.jo/dos_home_a/main/index.htm</u>, population sub-website

⁷⁷ MOL (2009). Jordan Labor Market in 2008, Ministry of Labor, Amman, Jordan



4.2.4 Rural population

The total population living in rural areas increased from 407 thousand 1952 to about 1 million in 2011⁷⁸. The %age of rural population decreased from 64 % in 1952 to 17.4 % in 2011. Jordan is characterized with high urbanization. The urbanization rate reached to 82.6 %. About 60 % of people living in Mafreq governorate are rural people, followed by Ma'an with about 45 % and Jerash with about 37 %.

Larger villages were located in the more fertile, generally irrigated regions where family members could reach their fields with relative ease. While villages' population continued to grow, rural-urban migration drained off a steady stream of young men and sometimes whole families. Villages provided little employment for their residents, and agriculture as a way of life had declined precipitously.



⁷⁸ DOS, 2012, http://www.dos.gov.jo/dos_home_a/main/index.htm

4.2.5 Internal and External Migration

More than 8 % of people born in Jordan are participating on the wave of internal migration as reported by household census in 2004. Amman and Zarqa receive 37 and 23 % of them, respectively. Zarqa is the main source of internal migration to Amman with 30.4 % followed by Irbid and Balqa. However, Ajloun, Maan and Karak governorates considered as pulling out governorates. Aqaba and Amman are pulling-in governorates and are the most attractive destination for internal migration

The sudden influxes of migrations over the past sixty years exerted heavy pressure on natural resources, infrastructure, public services, housing and other services. Jordan thus became a labour recipient while continuing to export its skilled workers. Immigrants were mostly men from Egypt and Syria. In 2010, the migrant labour force is estimated about 298,000 workers. 28.7 % of the migrants labour are engaged in agricultural sector or about (85,623) employee most of them are migrant labour.

In 2008, it was estimated that roughly 350,000 Jordanians were working abroad. Remittances exceeded export income and amounted to just under US\$4 billion, or 20 % of the country's GDP according to the World Development Indicators of the World Bank.

The internal migration from rural areas to urban areas can be linked directly to agricultural activity. Land fragmentation affects food production and is a direct result of rapid population growth. Often landholdings which are too small to provide a tolerable livelihood have been turned into part-time farms, with some household members staying at home to tend crops while others (often the men) migrate in search of wage employment. Alternatively, land is sold to wealthier landowners, making land distribution more uneven and adding to the creation of a large pool of landless labourers. In addition, rapid population growth can lead to inappropriate farming practices that impoverish and erode the soil; reduce vegetation; over-use and improperly use agrochemicals; and frustrate water resource management. The result of such practices is severe land degradation.

4.2.6 Employment and Agricultural Labour Forces

The Jordanian labour force is about 1,235,000 in 2010. The public sector employs about 24 % of labour force followed by wholesalers and retailers. The industrial sector employs about 10% of labour force; the unemployed person is estimated about 176,000 people. Therefore the Jordanian workforce reached 1,412, 000 in the year 2010.

While labours in the 1950s were predominantly employed in agriculture, the agricultural labour force in 1961 reached 33.5 % of the total labour. The statistics indicate that the number of inhabitants depending on agriculture had reached about 20% of the total population in 1983. However, the Jordanian labour force increased from 1055 thousand in 2006 to 1235,000 in 2010. Over the same period, agricultural labour decreased from 32.9 thousand to 25.0 thousand. This indicates that the contribution of the agricultural sector to employing manpower declined from 3.1 % in 2006 to only 2 % in 2010.

4.2.6.1 Migrant Agricultural Labour

On the other hand, the Jordanian labour market, especially in the agricultural sector, shows an increase in the employment of migrant labour⁷⁹. The current agricultural labour market suffers from a shortage of Jordanian labour. Because of the availability of relatively cheap labour from outside, the difficulty of daily mobility of labour to the production regions (mainly Jordan Valley) and the dominance of subsistence agriculture in the rainfed regions, many Jordanian farmers have become more interested in working on a sharecropping basis or leasing their land.

The migrant labour force is estimated about 298,000 employees. Therefore the total workforce in Jordan is about 1,710 thousand in 2010⁸⁰. About 28.7 % of the migrants labour are engaged in agricultural sector or about (85,623) employee most of them are Egyptian labour. The source of this data is the ministry of labour which is the sole government body responsible for issuing work permit. Migrant workers did not take the place of skilled Jordanian expatriates but of unskilled non-migrants who experienced a professional upward mobility, leaving agriculture and moving from rural areas to the cities, and contributing to the growth of the capital, Amman

The distribution of agricultural hired permanent migrant labour in the Jordan Valley and Highlands was estimated with about 8,163 and 9,175 workers in 2010, the rest are either seasonal labour or casual labour. It should be considered here, however, that these figures only included the agricultural workers receiving wages. The % of workers who did not receive wage, i.e., self-employed and sharecropper workers reached about 50 per cent of the total.

4.2.6.2 Family Labour

The composition of the labour force in the agricultural census of 2007 shows the predominant form of agricultural labour is family labour, with unpaid family labour being 77 % of the total in rainfed agriculture. Children under 15 years also contributed to a minor part of farm labour.

Socio-cultural values hinder a large-scale participation of women in agricultural activities other than family farming. In 2010, the number of women working as hired agriculture labour was very low. Of the total paid labour, 89.4 % were male and 10.6 % female.

In spite of that agriculture remains a critical livelihood source for farmers in rural areas; they have reduced their dependence on it, in part due to chronic water shortages and, with the drop in fodder subsidies and deteriorating natural resources, fewer livestock holdings. As coping strategies, poor rural households may use children as family labour when necessary rather than hire outside labour; poor women may work in casual daily labour on large farms; some households rely on domestic gardens for family consumption.

On the other hand, in irrigated areas most of agricultural operations are conducted by hired labour (78 %), whereas only 22 % of agricultural operations are conducted by family labour.

⁷⁹ DOS (201). Labor statistics in Jordan 2006-2010. http://www.dos.gov.jo/dos_home_a/main/index.htm.

⁸⁰ 1,235,000 employee, 176,000 unemployed, 298,000 guest migrant labour

These %ages are varying according to holding size. The Agricultural Censuses 2007 reveals that 88 % and 94 % of labour is provided by the farm households for the holdings of less than one ha under irrigated agriculture and rainfed farming.

The distribution of agricultural hired labour by governorates shows that most of hired labour (35%) is in Balqa governorates, mainly Middle and south Jordan Valley districts. About 21% of hired labour is in Ibid governorate, mainly Northern Jordan Valley district. Wages in the agricultural sector were forced to go up in the recent years, and the scarcity and high cost of hired labour had a discouraging effect on farmers. The shortage had different consequences for rainfed and irrigated agriculture. It reduced the scale of rainfed farming, but most farmers in irrigated areas merely relied more on migrant labour. It was estimated that 72% of the paid agricultural labour force was migrant labour.

4.2.7 Rural poverty

The absolute poverty (food & non-food) line was estimated with 680 JD per capita in 2008 at the Jordan level as shown in Table 8. Amman registered the highest poverty line with 703 JD per capita per year⁸¹. The lowest absolute poverty line was found in Mafreq and Jerash governorates with about 656 JD per capita per year. Because prices differ across the country, the poverty line needs to be adjusted accordingly. For example, a family of 6 living in Mafreq would be considered to be living at the poverty line if they spent JD 263 per month, while the same family would need to spend JD 291 per month to have the same standard of living in Amman (due to higher prices in Amman). Therefore, the general poverty line per capita per month is 56.7 JD or JD 292 per year. For a typical household size with 5.7 members, the general poverty line will be 323 JD per month or about JD 1,665 per year.

The budget for other expenditures was set at the amount spent on non-food expenditures by Jordanians whose food budget was exactly at the poverty line food budget. On this basis, the poverty line non-food budget was JD 32.3 per person per month. Thus the poverty line budget (including both food and non-food components) was JD 56.6 per person per month for the year 2008)



Figure 10: Abject and absolute poverty lines by governorate

⁸¹ The population higher council, 2011. The status of Jordanian population.

http://www.hpc.org.jo/hpc/tabid/198/ctl/details/mid/580/articleID/140/checkType//Default.aspx

The poverty ratio (%age of individuals whose expenditure is below the poverty line) was 13.3 % in 2008^{82} (against 14.7 % in 2005 and 14.2 % in 2002). The poverty rate in rural areas was 22.8 % (against 18.7 % in 2002). In urban areas, it amounted to 13.1 % (compared with 12.9 % in 2002).

Governorate	Food	Non-food	Absolute	Poverty	% of	% of	% of
	Poverty line	poverty line	poverty line	%	Poor	Poor	Poverty
	(JD/c/y)	(JD/c/y)	(JD/c/y)		Population	household	Severity
Amman	300	403	703	8.3	24.6	5.7	0.47
Balqa	290	382	672	19.7	8.7	13.9	1.30
Zaqra	285	377	662	11.2	11.7	7.9	0.47
Madaba	293	384	677	14.9	2.6	10.4	0.66
Irbid	292	376	668	14.7	20.5	11.6	0.81
Mafreq	277	379	656	31.9	11.9	25.6	1.96
Jerash	284	372	656	20.3	4.6	16.1	1.67
Ajloun	294	383	677	13.3	2.3	10.1	1.07
Karak	286	413	699	17.1	5.5	12.0	1.25
Tafileh	285	375	660	21.1	2.2	16.9	0.57
Maan	295	379	674	24.2	3.4	17.8	2.00
Aqaba	283	385	668	11.8	2.0	8.3	1.30
Total	292	388	680	13.3	100	9.5	0.79

Table 9: Main Poverty Indicators in Jordan in 2008

Source: DOS, 2011. Jordan Poverty Report

Using 2006 as the base year, the Jordanian poverty line was JD 46.3 per person per month (JD 278 for a family of six). In 2006, 13 % of the population was below the poverty line. Comparing the results of 2006 and 2008 shows that the poverty level is increasing due to international increasing of food prices. The pockets of poverty are mostly rural. The highest rate of poverty was observed in Mafreq governorate with about 31.9 % followed by Maan 24.2 % and Tafileh by 21.1 %, Amman has the lowest poverty ratio 8.3 % followed by Zarqa 11.2 %, then Aqaba governorate by 11.8 %.

Thirty two poverty pockets were identified in 2008 compared to 22 pockets in 2006 study. Although Amman has the lowest poverty rate of all governorates, it is home to the largest number of poor individuals due to the concentration of population in Amman. Several sub-districts, including Wadi Araba, Rwashed, Mraighah and Ghawr Almazra'a, Diesah have very high rates of poverty⁸³ exceeds 40%.

The most significant causes of poverty in rural Jordan are high unemployment in rural areas and low wage rates; drought seasons, which in recent years have become an almost permanent feature an average family size for the poor in rural areas of some 9 persons (compared with a national average of 5.8); desertification and the deterioration in pasture land; and uneven economic growth.

⁸² Jordan Poverty Report(DOS 2011) based on analysis of 2008 Household survey results

⁸³ The World Bank (2009). Jordan Poverty Update - Volume I: Main Report. Report No. 47951-JO

4.3. National agriculture policies, strategies, laws, and programmes

Policies, strategies, laws, and temporary laws for agriculture, land use, livestock, rangeland use, water resources, environmental protection and biodiversity were developed and are coordinated by various public ministries as relevant, with valid degrees of performance and effectiveness). The highlights are summarized in (Table 10), followed by analysis of effectiveness

Document	Year	Туре	Description
Groundwater Management Policy of 1998	1998	Policy	The objective of this policy is to outline in more detail the statements contained in the document entitled: "Jordan's Water Strategy". The policy statements set out the Government's policy and intentions concerning groundwater management aiming at development of the resource, its protection, management and measures needed to bring the annual abstractions from the various renewable aquifers to the sustainable rate of each.
Agricultural Policy Charter (ACP).	1996	Policy	The Charter aims at achieving consistency of agricultural development with local, regional and international requirements and changes, and an integrated socio-economic development characterized by efficiency, sustainability and equity. Clear policy objectives and priority sub-sectors were defined.
Irrigation Water Policy of 1998	1998	Policy	The policy addresses water related issues of resource development: agricultural use, resource management, and the imperative of technology transfer, water quality, efficiency, cost recovery, management and other issues. Linkages with energy and the environment are accorded a separate chapter. The policy is compatible with the Water Strategy and is in conformity with its long-term objectives.
Irrigation Water Policy of 1998	1998	Policy	The policy addresses water related issues of resource development: agricultural use, resource management, and the imperative of technology transfer, water quality, efficiency, cost recovery, management and other issues. Linkages with energy and the environment are accorded a separate chapter. The policy is compatible with the Water Strategy and is in conformity with its long-term objectives.
Wastewater Management Policy of 1998	1998	Policy	The objective of this policy is to outline in more detail the statements contained in the document entitled: "Jordan's Water Strategy". The policy statements set out the Government's policy and intentions concerning wastewater management aiming at the collection and treatment of wastewater from different locations. It also aims at the reuse of treated wastewater and sludge.

Table 10: The policies strategies and	laws related to Agricultural sector
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Irrigation Equipment and System Design Policy of 2008	2008	Policy	This policy statement follows from longer-term objectives outlined in the Water Strategy and supplements the Irrigation Water Policy and the Irrigation Water Allocation and Use Policy by establishing a policy on irrigation equipment and system design standards. The policy addresses the following themes: defining and updating equipment standards, raising farmers' awareness of standards, testing and enforcement of standards, training and certifying drip system designers, and institutional responsibilities.
Irrigation Water Allocation and Use Policy of 2008	2008	Policy	This policy statement follows from longer-term objectives outlined in the Water Strategy and elaborates on priorities specified in the Irrigation Water Policy. As such, it comprises an updating and extension of selected elements of the irrigation water policy. In particular it consolidates and elaborates elements of that policy relating to on farm water management, management and administration, water tariffing, and irrigation efficiency. The policy addresses the following themes: defining and updating crop water requirements, water allocation and billing practices, building farmers' water management skills, using reclaimed water, measuring deliveries and delivering water to groups.
National Strategy for Agricultural Development:2002- 2010	2002	Strategy	The National Strategy for Agricultural Development (NSAD) was prepared for the period 2002-2010. The strategy discusses the role of the agricultural sector in social and economic development to achieve a sustainable agricultural and rural development taking into consideration the social economic and environmental aspects e.g. protection and conservation of ago-biodiversity of such development. The strategy presents profiles of proposed projects in the five agricultural sub sectors of rainfed agriculture, irrigated agriculture in the Jordan Valley, irrigated agriculture in the highlands, livestock and rangelands and marketing of agricultural produce.
National Rangeland Strategy	2001	Strategy	This strategy was developed in 2001 with the main objectives of controlling deterioration of the rangelands and reversing the desertification process; increasing sustainable livestock production by restoring the productivity of rangelands and increasing sustainable range fodder production; supporting fodder production in order to encourage intensive breeding; and encouraging local communities and sheep breeders to adopt intensive breeding techniques to regulate stocking rates.

JVA Strategy Plan for 2003 – 2008	2003	Strategy	The document helps describe (Jordan's Valley Authority) responsibility towards its water sector by the following four major goals (water resource management and development, water supply and distribution, land development and management, organizational performance improvement and development).
Water Strategy for Jordan of 1997	1997	Strategy	The document helps describe Jordan's responsibility towards its water sector by the following themes: resource development, resource management, legislation and institutional, shared water resources, public awareness, performance, health standards, private sector participation, financing and research development.
Jordan's Water Strategy 2008-2022: Water for Life	2009	Strategy	This is the most recent strategy that specified drinking water as the main priority in water allocation, followed by industry and agriculture. It includes specific actions and plans with targets to be achieved. Furthermore, the strategy emphasis on the two mega projects; the Disi water conveyance and the Red-Dead Canal, the reduction of the Non- Revenue for Water (NWR), on having cost reflective tariffs and restructuring the institutions of the water sector.
National Environmental Strategy (NES) :	1992	Strategy	The NES catalogues all environmental pressures and problems and contains over 400 specific recommendation and suggested actions in the field of environmental protection and conservation.
Poverty Reduction Strategy	2002	Strategy	The National Poverty Reduction Strategy aims at improving living standards of all poor segments of the society. The strategy aims to alleviate poverty includes short, medium, and long-term initiatives in each policy area.
National Strategy and Action Plan to combat desertification	2006	Strategy	The strategy and National Action Plan (NAP) to combat desertification was launched in 2006. It includes six major programmes that are mainly "project-based". The programmes include several projects related to desertification monitoring and control, capacity building, natural resources rehabilitation and development.
The National Agenda 2006	2006	National Strategy	The National Agenda was launched in 2006 comprising a comprehensive political and socio- economic reform plan for the country until 2017. The main goal of the National Agenda is to achieve consistent policies and ensure that they will not be subject to government change while taking into considerations the need to regularly develop and update these policies

Agriculture Provisional Law No. (44)/2002.	2002	Law	Organize and develop the agricultural sector to attain a developed, growing, diversified, and integrated agricultural production that conserves the environment and natural resources; enhance self- dependency, and fitting the international, regional and domestic requirement.
Jordan Environmental Law	1995	Law	The Jordanian environmental law was enacted as a temporary legislation in 2003 and was ratified by the Parliament in 2006. This law provided the appropriate legislative umbrella for issuing of the various detailed regulations and instructions regarding the protection of the environment.
Jordan Valley Law	2001	Law	The objective of this law development of the water resources of the Valley and utilizing them for purposes of irrigated farming, domestic and municipal uses, industry, generating hydroelectric power and other beneficial uses; also their protection and conservation and the carrying out of all the works related to the development, utilization, protection and conservation of these resources.
Water Authority Law No 18 of 1988	1988	Law	It established the Water Authority of Jordan (WAJ) established in 1988 as an autonomous corporate body, with financial and administrative independence. The law describes the Mandate of WAJ, in which WAJ is fully responsible for providing municipal water and wastewater services, and development and management of groundwater resources. It also clarifies WAJ's relationship with the Ministry of Water and Irrigation.
Law of Agricultural Credit Corporation" (50) /1959	1959	Law	The law addresses Credit sources and credit policy and unified the agricultural credit sources and set a credit policy based on sound scientific, economic and technical bases as well as securing an effective monitoring of the loans spending for their purposes and objectives.
The cooperative law number (18) for the year 1997,	1997	Law	The law granted the JCC the official feature as a general institution that is independent financially & administratively. The law also addressed restructuring the cooperative sector and adherence to implementing the valid active rules & laws in Jordan according to the Cooperative law.
Ministry of Water and Irrigation By Law No 54 of 1992	1992	By -law	It established the Ministry of Water and Irrigation, in which it gives the full responsibility for water and public sewage in the Kingdom as well as the projects pertaining thereto, formulation and transmission of the water policy to the Council of Ministers for adoption. The by-law gives the Ministry full responsibility for the economic and social development of the Jordan Valley as well as carry out

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Image: Second state state Image: Second state Image:				
Underground Water 2002 By-Law The by-law describes and entails the different				all the works which are necessary for the realization of this object.
Control By-Law No 85 of 2002 procedures that are needed for controlling groundwater resources in Jordan. It helps explain the utilization and extraction quantity allowed. Moreover, conditions about licenses and their cost for borehole drilling, and water extraction fees are included in this regulation.	Underground Water Control By-Law No 85 of 2002	2002	By-Law	The by-law describes and entails the different procedures that are needed for controlling groundwater resources in Jordan. It helps explain the utilization and extraction quantity allowed. Moreover, conditions about licenses and their cost for borehole drilling, and water extraction fees are included in this regulation.

4.3.1 Analysis on how relevant policies are impacting the Agriculture sector

4.3.1.1 Water policies

The JVA is responsible for the delivery of water to the farm gate, and are not directly responsible for providing farmers with advice on how to grow their crops or manage the use of irrigation water at the farm level. Also, the JVA is mandated to conduct studies of new irrigation technologies, but the law is unclear about how the information generated should be disseminated to farmers. The JVA officials believe that the authority should also play a greater role in providing extension services to farmers related to water management, which is now the responsibility of the MOA.

The overall efficiency of the Jordan Valley irrigation system is high. However on farm efficiency is still below 50% in many cases. A continuous decline in the quantity of fresh water available for agriculture, and the continued deterioration of its quality due to the increased rate of its mixing with treated wastewater of high salinity, especially in the middle Ghors (Jordan Valley), which has already resulted in increasing soil salinity, at a time when there are no adequate water resources to be used for soil leaching⁸⁴. Currently, farmers are not granted permits to dig groundwater wells for agricultural purposes as farmers in Disi indicated during the mission field visit to the area and meeting with farmers.

Policy and programmes need to concentrate on improving on-farm efficiencies, and a significant part of such improvements can come from altering cropping patterns in order to concentrate on products that generate higher returns per unit of water used. New strategies for water development and management are urgently needed to avert severe national, regional, and local water scarcities that will depress agricultural production, damage the environment, and escalate water-related health problems. Close coordination must be maintained between the Ministry of Agriculture and JVA and with other related institutions with the aim of enhancing on-farm irrigation efficiencies and maximizing the agricultural output of a unit of land area per unit flow of irrigation water. It is also recommended that a new set of standards be developed for use of treated wastewater and blended water in agriculture, and that a framework be established for the kinds of irrigation technologies appropriate to each grade of water quality.

 ⁸⁴ Farmers meeting in Deir-Alla,, Jordan Valley, February 22,2012,
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4.3.1.2 Quality control

All agricultural products produced within Jordan and imported into Jordan are inspected for quality and health standards. While health standards are well defined, quality standards are not. Most quality standards are based on the size of the fruit or vegetable. Livestock products are inspected at government slaughterhouses⁸⁵. Imported products require certificates of origin and a health certificate stating that the product is clear of diseases, radiation, and not hazardous to humans or the environment. Live animals being imported are subject to inspection and quarantine⁸⁶. Fruits and vegetables for exports are inspected by request to ensure international quality standards are met and to obtain necessary certification to prove that goods are free of diseases and residuals. Jordan's crop and livestock product standards related to health are internationally recognized norms.

Laboratory facilities for testing for chemical residues are present in Baqa'a (nearby Amman) and being supervised by the MOA. The process of obtaining international certification of the laboratory results needs to be completed, so that importers in other countries do not feel obliged to submit the products to new tests at accredited laboratories. Jordan now has laboratory capabilities for microbiological testing at the Royal Scientific Society and some producers have used that facility. On the basis of this infrastructure, the most urgent needs in this area are the development of a national set of food safety standards and obtaining international accreditation for laboratories in Jordan.

4.3.1.3 Marketing policies

Jordanian agricultural production, including that which is destined for export, does not receive any incentives except the price of irrigation water and the cost of pumping, and the willingness to ban exports temporarily in the face of perceived scarcities on the domestic market. Extra costs on the production and marketing chain are imposed in the form of requirements to use municipal markets⁸⁷, even in the case of exports and even when direct sales to retailers could be made by farmers or farmer organizations.

Current import tariff policy encourages resource allocation to crops that represent inefficient uses of water, in terms of income generated per cubic meter of irrigation water: bananas, apples, and oranges. In addition, in the case of apples and oranges at least, it is clear that Jordan does not have a comparative advantage in production. (Syria produces oranges and apples of equal or higher quality at a much lower price⁸⁸.

In the marketing area, the problem of a "weak marketing system and its failure to direct production towards demand," The National Strategy for Agricultural Development recommendations are limited to concluding bilateral agreements for market opening without addressing regulations requiring all sales, including exports, to go through municipal markets paying a 4% municipal sales tax, a 4% market tax, a 5% commission agent fee, and a sales tax on the commission of 16% of it. This requirement also affects producers who wish to sell directly to retailers.

Government policies have, long considered marketing only as a supplementary service for production despite the fact that marketing starts before production, its creation of greater

⁸⁸ Citrus Growers meeting, Northern Jordan Valley, February 19, 2012.

⁸⁵ Site visit to Greater Amman Municipality slaughterhouses Directorate, March 1, 2012.

⁸⁶ Field visit to the Animal Quarantine near Aqaba port, March 10, 2012.

⁸⁷ Visit to the Wholesale market and meeting with market middleman (commissioners). March 1, 2012.

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economic benefits, and its importance in determining economic returns. Most policies have focused on developing production, which resulted in over-supply of some products, and wasting large quantities of horticultural produce because of imbalance between supply and demand. The lack of organized production plans and weak farmer organizations also adds to the problem of poor marketing. The marketing infrastructure suffers from clear weaknesses, especially in the fruit and vegetables sectors. Fruit and vegetables wholesale markets do not represent real markets, with the exception of the one in Amman, which still lacks the essentials of supply and demand data for price formation.

Infrastructure for post-harvest operations also suffers from shortages in the areas of pre-cooling, grading, packaging, refrigerated transport and storage, and processing of products. Absence of support to small farmers' groups (farmers' organisations) c-to enhance their capacities to enhance vertical integration means along the food supply chain (e.g. cooperatives that are capable to acquire cold chains, packaging facilities)

Significant weaknesses also exist in the provision of marketing support services, including market research, agricultural extension services, market information, and to a lesser extent, in the area of financing. There are few policies for direct economic market intervention; those that exist are characterized by their temporary nature and instability, such as in the case of protecting local production, or by the unsuitability of the mechanism used for their objectives, such as in the subsidies provided to sheep and goat breeders. It is recommended to have a comprehensive marketing policy to address all the gaps previously mentioned.

4.3.1.4 Agricultural Credit

The Agricultural credit Corporation or ACC makes soft loans available to farmers and investors in agribusiness. The loans fall into one of two classes-either operational or developmental. Operational loans are from 12-24 months in duration while development loans may be made for up to 15 years. At present, the Agricultural Credit Corporation (ACC) is the only specialized agricultural credit institution in Jordan. Most of the loans offered by ACC are medium-term loans for financing land reclamation, purchasing farm machinery, planting fruit trees, drilling deep wells, erecting greenhouses and purchasing drip irrigation systems.

ACC development loans were in strong demand, not just because of the discounted interest rates and lack of commissions and fees, but also because commercial banks generally refused to provide loans with maturity beyond three years.

ACC has not been involved at all in agricultural marketing, yet it could play a vital role in promoting high-value agricultural exports. It would be important to try to involve ACC in this area, particularly in providing export credit. Equally, it could participate in financing schemes for more efficient irrigation, especially low-pressure irrigation.

4.3.1.5 Land use policies

There is a continuous decline in the area of productive agricultural land, due to the encroachment of urban activities on agricultural lands, in the absence of a law that regulates land use for

different purposes throughout the country. Agricultural land located within municipal boundaries is in danger of being converted to non-agricultural uses.

The fragmentation of agricultural land, converting larger parcels into small production units unsuitable for mechanized agriculture, resulted in leaving large areas of land uncultivated every year or to transformation of agricultural lands to housing and industry complexes. The legislation passed by the government, allowing partitioning of land ownership outside municipal boundaries into smaller areas, have also contributed to the fragmentation of these ownerships and forcing them out of production.

4.3.1.6 Rangelands

The poor management of rangelands, the destruction of plant cover, weakening of productive capacities of rangelands, and the allocation of about 10 million du of rangelands known as claimed tribal lands to private owners, without proper plans for their development and management as a natural resource. This facilitated promotion of real-estate business in the rangeland areas and use of large areas for non-agricultural purposes. Ineffective or poor compliance with rangeland strategy and related legislative laws and the absence of a national comprehensive and integrated plan for rangeland use and development, and the continued urban encroachment on forest lands resulted in the deterioration of the natural vegetation. At present the vast rangeland areas in Jordan cannot provide animal feed for more than 3 month during the good rainy seasons and less than one month or non during the drought years.

In conclusion, the ability of the strategy and policy developers to identify problems is sound and commendable. However, it seems that none of these policies and strategies was linked to tools and effectiveness environments. Currently the Ministry of Agriculture is conducting a review of the existing Agriculture strategy and preparing for a medium and long term agricultural development strategy with the assistance of FAO. It is recommended the MOA take into consideration issues raised in the above analysis section and incorporate the needed revisions and amendments in the new strategy.

4.3.1.7 Food Safety laws in Jordan

The current food control regime in Jordan falls under two laws: The Agriculture Law No. 44 of 2002 and Jordanian Food Control Law No. 32 of 2003. These laws were adopted at the Aqaba Special Economic Customs Center in May 2002 and at Amman Customs Center in January 2004.

Inspection criteria are codified into a computerized system. This system has been applied at all border centres should the infrastructure for these centres is completed. A border committee comprised of representatives from relevant agencies inspects imported agricultural and food products ⁸⁹[1]

⁸⁹ Mohamed Khraishy. 2009. Food and Agricultural Import Regulations and Standards – Narrative- FAIRS Country Report – Jordan. USDA Foreign Agricultural service. Amman, Jordan.

4.3.1.8 Pesticides and Other Contaminants

Pesticides in Jordan are regulated by the Ministry of Agriculture (MOA) Plant Protection Directorate/ Pesticides Division. Each imported pesticide shall be analysed for conformity in composition and concentration, using the Food and Agriculture Organization of the United Nations (FAO) standards if it is an agricultural pesticide, and using the World Health Organization (WHO) if it is a pesticide used for public health (Like Cockroach sprays, mosquito repellent, etc.)

Pesticides residue in the food chain in Jordan is a sensitive issue. There is only one laboratory in Jordan that is capable of testing for pesticide residues in fresh fruits and vegetables, and its turnaround time is about two weeks.

4.3.1.9 Social welfare policies and programmes

The government has implemented a series of programmes aimed at poverty alleviation by providing a better source of income to the poor and unemployed, in particular. The programmes implemented are free education and primary health care, business training for micro and small enterprises, social productivity programmes such as small agribusiness projects (food industry, growing mushrooms and medicinal herbs, pickling, processing dairy products, honey beekeeping)

4.3.1.10 Agricultural Extension Policy

The agricultural extension service in Jordan is still not performing efficiently due to lack of extension officers training and budgets. This reflects negatively of technology adoption, and thus low productivity and competitiveness. The Government formulated a national strategy for agricultural-extension whereby a committee was established by combining the extension and research departments together

4.4. Competitiveness of Agricultural sector

4.4.1 Agriculture Economy

The Jordan GDP at market prices increased from JD 201 million in 1964 to JD 16,762 million in 2010^{90} . The rate of growth of the GDP at constant prices was 5.8 % during the period 2001-2005, and 6.3 % during the period 2006-2010.

The relative share of the agricultural sector (AGDP) to the total GDP declined from 30 % in1954 to 2.99 % in 2010⁹¹, but this was interrupted by relative increase between the 1970s and 1980s (from 4.2% to 6.1&). However, the AGDP at market prices increased from JD 32 million in 1964 to JD 176 million in 1995, JD 373 million in 2008 and JD 560 million JD in 2010⁹² as shown in Table 11 The total agricultural gross outputs increased from JD 540 million in 2000 to JD 1326 million in 2008.

Indicators	1986	1990	1995	2000	2005	2008
Plant Gross Output	98.8	173	221.1	201.1	307.2	450.5
Livestock Gross Output	168.5	266	351.4	339	458.3	876.2
Total Agricultural Gross Output	267.3	438.9	572.5	540.2	765.5	1326.8
Plant Intermediate Consumption	39.9	49.1	121.4	139.2	188.1	197.9
livestock Intermediate Consumption	113.9	198.9	274.8	280.8	331.3	755.3
Total Intermediate Consumption	153.8	248	396.2	420	519.3	953.2
Plant Value Added,	58.9	123.8	99.7	61.9	119.1	252.7
Livestock Value Added	54.6	67.1	76.7	58.3	127.1	120.9
Total Value Added (A. GDP)	113.5	190.9	176.3	120.2	246.2	373.6

 Table 11: Contribution Agricultural to actual GDP in millions: Agriculture Gross Outputs, intermediate consumption and Gross

 Domestic Product (GDP) in million JD

Source: compiled from DOS

4.4.2 Jordanian Horticultural Competitiveness

Total plant production in 2010 amounted to 2,568,000 Tonnes of which 318,000 Tonnes are field crops. The vegetables production amounted to 1,790,000 Tonnes as shown in Table 12 of which winter-vegetables amounted to 932,000 Tonnes and summer-vegetables amounted to 858,000 Tonnes for the year 2010. While the production of fruits amounted to 460,000 Tonnes of which one third is olive as shown in Table1

Agricultural production in Jordan has witnessed a tremendous growth during the last decade. Vegetable production has doubled since 2000. This was mainly due to the expansion in irrigation especially in the highland areas, widespread of plastic houses, and the adoption of new hybrid-high yielding varieties.

⁹⁰ Central Bank of Jordan. Monthly Statistical Bulletin. For the years 2004,2005,2010;

http://www.cbj.gov.jo/pages.php?menu_id=11&local_type=0&local_id=0&local_details=0&local_details1=0&localsite_branchna me=CBJ

⁹¹ Central Bank of Jordan. Monthly Statistical Bulletin. For the years 2004,2005,2010;

⁹² Central Bank of Jordan. Monthly Statistical Bulletin. For the years 2004,2005,2010;

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Production has also increased in response to expanding demand for fresh produce, domestically and in neighbouring countries.

	2000				2010			
	Area	Yield	Production		Yield	Production	Production	
Crop	(du)	(Tonnes/du)	(Tonnes)	Area (du)	(Tonnes/du)	(Tonnes)	Growth rate	
Tomatoes	81,152	4.37	354,292	141,887	5.2	737,262	7%	
Cucumber	11,086	11.99	132,918	20,120	8.76	176,179	3%	
Potato	36,731	2.64	97,075	57,969	3.02	174,931	5%	
Water melon	10,652	3.29	35,011	37,446	4.09	153,118	13%	
Eggplants	16,672	2.14	35,726	30,100	3.48	104,748	10%	
Squash	28,354	1.75	49,484	34,104	2.04	69,655	3%	
Cauliflower	13,478	1.95	26,338	18,159	3.01	54,734	7%	
Lettuce	6,641	1.75	11,624	14,357	3.36	48,200	13%	
Sweet pepper	5,580	2.28	12,713	11,158	3.28	36,590	10%	
Jew's mallow	13,957	1.59	22,228	12,798	2.79	35,659	4%	
Sweet melon	12,001	2.84	34,031	8,185	3.79	31,051	-1%	
Total vegetable	328,817	2.94	966,007	480,806	3.72	1,790,140	7%	

Table 12: Development of Vegetable Production in Jordan

Source: DOS 2012

Fruit production has shown upward trends similar to vegetables. The production has steadily increased throughout the period (2000-2010) and amounted in 2010 to about 420,000 Tonnes compared to 371, 000 Tonnes in 2000. The most significant increase of fruit trees production in the JV was in citrus and bananas. Citrus are mainly exported to Gulf markets, however bananas are consumed locally. Olive trees are the main fruit trees cultivated in the highlands under both irrigated and rainfed conditions. Olives are consumed either as pickled fruits or as olive oil. Exports of olives and olive oil are limited.

	2000						
							Production
	Area	Yield	Production	Area	Yield	Production	Growth
	(du)	(Tonnes/du)	(Tonnes)	(du)	(Tonnes/du)	(Tonnes)	rate
Olives	637,529	0.21	134,285	608,788	0.28	171,672	2%
Bananas	20,824	1	20,832	18,527	2.36	43,753	7%
Grapes	37,386	0.64	23,910	31,986	0.93	29,683	2%
Apples	39,379	0.95	37,468	22,910	1.26	28,770	-2%
Lemons	22,593	1.27	28,679	17,336	1.66	28,739	0%
Clementines	17,598	1.74	30,666	13,138	1.89	24,872	-2%
Peaches	16,137	0.43	6,909	17,644	1.31	23,153	11%
Oranges, navel	9,478	1.81	17,189	11,950	1.42	17,000	0%
Others	6,174	0.53	3,255	13,821	1.04	14,323	13%
Mandarins	9,142	2.05	18,739	6,348	2.12	13,451	-3%
Dates	2,641	0.5	1,321	17,079	0.66	11,241	19%
Total Fruit Trees	868,692		371,287	826,950		460,242	2%

Table13: Development of Fruit Trees Production in Jordan

Source: DOS 2012

Jordan is one of the leading countries of the region in horticultural exports to Syria, Lebanon, traditional Arabian Gulf countries and to some EU countries especially during winter season. Total exports amounted to JD 4,217 million whereas agricultural exports amounted to JD 621 million (15 % of total exports) as shown in Table . The value of vegetable exports amounted to JD 324 million (63 % of total agricultural exports or 7.4 % of total export)⁹³. However, Total volume of horticultural exports amounted to a record figure in 2010 which is 755,000 Tonnes of which 685,000 Tonnes are vegetables and 69,000 Tonnes fruits (DOS, 2011). In other words, the vegetable exports in 2010 represented 38 % of Jordan production of vegetables. While fruits exports constituted only 15 % of the national production of fruits⁹⁴.

The main destinations of most of these exports are United Arab Emirates, Kuwait, Bahrain, Syria, Lebanon, Qatar and Oman and recently Saudi Arabia. In contrast to the sophisticated markets in the EU, these destinations do not have high quality and packaging requirements.

In the last two years vegetable and fruit exports have jumped and that together they represent almost 70 % of total agricultural exports. This indicates that there is a high potential for increasing horticultural exports. This potential can be realized in the future depends on tackling major obstacles related to water quantity and quality, overcoming the marketing obstacles. Expanding horticultural exports require the availability of additional water resources of high quality to meet sanitary requirements such as the global Gap and SPS regulations, availability of marketing infrastructure, implementation of contract farming and agricultural extensions. Also a great potential is available for organic farming.

Food Item	1995	2000	2005	2010
Live Animals	15,327	15,599	10,676	33,353
Dairy Products and Eggs	2,743	6,493	29,446	38,570
Cereals and Cereal Preparations	3,174	2,304	7,334	19,865
Vegetables	53,821	59,109	158,658	323,839
Fruits and Nuts	14,393	12,740	23,926	68,460
Fodder	553	12,415	6,416	12,905
Food and Live Animals	99,509	116,422	274,978	621,491
Total Export	1,004,534	1,080,817	2,570,222	4,216,949

Table 14: Agricultural Domestic Export in (000 JD)⁹⁵

Source: CBJ 2012

The potential for increasing vegetable production base there is very promising especially in JRV. This could be accomplished through:

- The intensification of technology and methodology used for vegetable production such as green house, fertigations, organic, IPM, low input agriculture technologies;
- The increase in cropping intensity with the additional TWW that will be generated after completions of the Disi project.

⁹³ CBJ, 2012). Monthly Statistical Bulletin

⁹⁴ CBJ (2011). Monthly Statistical Bulletin, Vol.47, No 12, Central Bank of Jordan

⁹⁵ CBJ (Central Bank of Jordan), (2011). Monthly Statistical Bulletin, Research Department. Volume 47, No. 12, December, 2011, Amman. Jordan

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- Establishment of facilitating infrastructure such as packing and grading units, cooled storage houses and assembly markets, refrigerated transport vehicles that match with international regulations.
- Enlarging the production base capacity of vegetables through changing the cropping pattern.

In spite of the shortage of the marketing channels and the modesty services offered by intermediaries through these channels, marketing margins are considered high in an unjustified way which makes the difference between the farm gate price and consumer price in most of the products high and that clearly indicates to the increasing profits of the marketing channels intermediaries over producers and consumers. The marketing margins and prices in which the continuation of depending on the current marketing infrastructure and the weakness of the institutional relationships between producers and consumers will lead to the continuation of producers complain from the huge difference between the prices that consumers pay,

Furthermore, previous studies on the competitiveness of agricultural production and production trends have shown that Jordan enjoys strong comparative advantage in the production of almost all types of vegetable crops and selected tree crops. The calculated comparative advantage indicators in the form of domestic resource coefficients showed a strong comparative advantage for seedless table grapes, green beans and strawberries that are mainly produced during the winter season in the Jordan Valley⁹⁶. In contrast, some other studies concluded that Jordan lacks a comparative advantage in production field crops such as irrigated wheat and barley, in comparison with neighbouring countries like Syria.

4.4.3 Commodity Value Chains

The value chain describes the activities that take place in a business and relates them to an analysis of the competitive strength of the business. Value Chain Analysis is one way of identifying which activities are best undertaken by a business and which are best provided by others ("out sourced"). What activities a business undertakes is directly linked to achieving competitive advantage. This implies that flows of resources, goods, services, knowledge and information.

Jordan's National Competitiveness Team in the Ministry of Planning, carried out a study in 2000 to improve the status of the agricultural cluster within the Jordanian economy as a whole, trying to identify the challenges posed, and accordingly solves or at least minimizes the problems accounted. They used Porter Diamond model to analyse the agricultural cluster in the Jordan valley. They concluded that the current situation of agricultural sector does not reflect its full potential.

Another study conducted on the Jordanian horticultural export competitiveness from water perspective shows that open field tomatoes is a comparative disadvantage. The value of DRC indicates that the value of domestic resources used to produce tomatoes in open field is greater than the contribution of its value added to social prices⁹⁷. Jordan has a comparative advantage in fruits and vegetables production, mainly during winter. Given its natural resources and climate, one might expect Jordan to be capable of producing a variety of high- quality fruits and vegetables to meet stringent consumer demands in both domestic and international markets

⁹⁶ E. K. Al-Karablieh, A.S. Jabarin and M. A. Tabieh (2011). Jordanian Horticultural Export Competitiveness from Water Perspective Journal of Agricultural Science and Technology. Volume1, No 7B (2011) pp. 964-974

⁹⁷ Al-Karablieh et al., (2011)

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4.4.4 Strawberry Value Chain Analysis (An Example)

Strawberry has been produced at a significant scale in Jordan for 25 years. In 1986 Jordan University farm launched this production in Jordan where it was almost unknown fruit in the country. The market expanded slowly and attracted some other growers to begin a production in the Middle Jordan Valley. Jordan strawberry production is now the fact of some 25-30 growers all around the country (Jordan valley and Highlands). The area cultivated by strawberry in Jordan can be estimated to 250 to 300 dunum in the Jordan Valley and 300 dunum in the Highlands. The production can be estimated between 2000 to 2500 Tonnes a year with an annual export of about 500 Tonnes mainly to Gulf States during summer and small portion to Western Europe during winter. The main exported strawberries come from the northern Jordan valley during December January and February. The highlands production is marketed in Jordan and part in the Gulf area. The production is centralized in spring between March and May, mainly coming from the Jordan Valley. On the peak period the prices collapse to around 1 JD/kg in the local market, whereas they are about 3 or 4 JD/kg in low production periods.

A value chain analysis for strawberry in Jordan, starting from construction of an enterprise budget at farm level to value added per Tonnes. The flows of the commodity form farm gate to consumer were followed by collection of additional costs occurred by market agents starting from containers, cooling, storage, transport, handling, packing etc. until the commodity in retailer store. The total transaction cost were estimated excluding the profit margin and labour cost. The wholesale price, retailers' prices and export price by market destinations was collected to estimate the value added by each agents in the marketing channels. The results individual value added for each agent in the value chain analysis for strawberry is shown in Figure 11. Farmers' value added is about 800JD/Tonnes for farmers and retailers. The value added by exporter to east Europe reach to about 880JD/Tonnes. The total value added for local and export market is shown in Figure 12. The value added to neighbouring and Gulf market is lower than the local market. The highest value added is in the export market to West Europe. The total value added for West Europe is about 1,848 JD/Tonnes compared to 1,093 for East Europe and 1,042 for Gulf countries' market.



4.4.5 Tomato Value Chain Analysis

The result of value chain analysis for tomatoes produced in Jordan Valley is shown that tomatoes do not generate a significant value added when it is exported to neighbouring. The finding contradicts not only the comparative Draft Final Report – Volume 1 – Specific Contract N° 2011/278635 – version 1

advantages theory but also the resources sustainability logic. Exporting tomato generates fewer value added compared to local market. This conclusion is derived from the great exports of tomatoes during peak production as an excess of the local market needs to avoid marketing bottlenecks. The results individual value added for each agent in the value chain analysis for tomato is shown in Figure 13. Farmers' value added is about 79JD/Tonnes for farmers and retailers. The value added by exporter to East Europe reach to about 814 JD/Tonnes. The total value added for local and export market is shown in Figure 14. The value added to neighbouring and Gulf market is lower than the local market (460 JD/Tonnes). The highest value added is in the export market to West Europe which is amounted to 909 JD/Tonnes compared to 308 in neighbouring market and 414for Gulf market.



Infrastructure for post-harvest operations also suffers from shortages in the areas of pre-cooling, grading, packaging, refrigerated transport and storage, and processing of products. Absence of support to small farmers' groups (farmers' organizations) to enhance their capacities to enhance vertical integration means along the food supply chain (e.g. cooperatives that are capable to acquire cold chains, packaging facilities)

4.4.6 Competitiveness of Livestock Sector

The livestock sector contribution to agricultural value added fluctuates from year to year (32 % in 2008, 58 % in 2003) as shown in Figure 15. The reason for declining contribution of livestock sector in GDP is increasing the international feed and forage prices in the last years.

In 2010, Jordan imported about half million heads of live sheep and goats, mainly from Australia with a value of about JD 37.6 million. On the same time, Jordan exported 16535 heads of lives sheep to with a value of JD 29.3 million⁹⁸. The local breed of Awassi sheep is preferred by local consumers and the market in neighbouring countries. The imported quantities of frozen, chilled or fresh red meat amounted to 107,000 Tonnes with a value of JD 198 million, whereas the exported volume of red meat amounted to 13,772 Tonnes with a value of JD 20 million.

⁹⁸ DOS, 2012. External Trade Statistics Draft Final Report – Volume 1 – Specific Contract N° 2011/278635 – version 1



Figure 15: Contribution of livestock sector to Agricultural GDP

High supplementary feed costs encouraged by the government barley subsidies and falling forage availability is a major constraint both on the profit margins of producers, and in the competitiveness of their products at national and international markets. Twenty years of subsidy and ease of transportation around the desert have encouraged the livestock industry to become dependent on barley, which accounted for 63 per cent of feed costs for producers. Barley remains cheaper than any other alternative cereal like maize but recent supplies from Syria have been of varying quality.

The government policy for subsidizing prices of imported inputs especially during the dry seasons (mainly animal feed) has also encouraged livestock herders to keep large number of animals that exceed the carrying capacity of the rangeland. However, it should be noted here that this situation has changed due the structural reforms that were introduced following the year 1995 as part of the agricultural structural adjustment program.

Input prices for animal feed increased dramatically (especially when the barley free market price was raised from 120 JD to 150 JD whereas the subsidized price is increased from 70 JD to JD 90 per Tonnes. Those increases have a major effect on livestock producers. Half or more of the diet of sheep, goats and cows is based on concentrates to be bought by the farmers. Poultry production is based completely on concentrate mainly maize that are not produced in Jordan. The price increases affect all the small ruminants producers, small farmers and herders are affected more seriously than others. It is believed that the nomads or transhumant households are suffering more than farmers in high rainfall areas. The nomads do not have any adequate possibility to change their norm of live and they do not have the option to increase own feed production.

Price support policies for both inputs and outputs played a vital role in shaping the production system in the rainfed region of Jordan. The government price support system for encouraging production of field crops (mainly wheat and barley) has triggered a huge production process in areas that are not suitable for field crop production. In one hand, this process has destroyed a major part of the fragile vegetative cover in the rangelands and on the other, increased the livestock numbers, predominantly those of small ruminants.

4.4.7 Competitiveness of Food Industry in Jordan

The food industries represented 12 % of the total value added in industrial sector (4.8 % of GDP), and provide employment opportunities for 20 % of the labour force in industrial sector in 2009 or about 3.9 % of total labour force in national economy (DOS, 2010) as shown in Table , and 16.4 % of labour compensation in 2009⁹⁹. Food industries is basically flour milling and bakery, dairy products, cooking oil, meat products, chocolate and sugar confectionery, and canning and preserving food products, juices, tomato pastes.

The food manufacturing index increased from 43 in 1975 to 104 in 1989 and to 154 in 1999 and to 302 in 2009. Thus, despite significant expansions of the industry and services sectors, agriculture remains an important economic sector in Jordan. The analysis of the contribution of traditional sectors to the growth of GDP does not give a fair credit to the role of agriculture in the economy. Hence, on this broad definition (agribusiness sector), agriculture is a major contributor to the growth of GDP, and to employment, which makes the development of agriculture under current global change conditions such as inflammation of food prices, climate change is prime importance in Jordan.

The dairy industry generated about JD 45 million of value added, and employed 4,367 labourers in 2010¹⁰⁰. The processing capacity of dairy factories in Jordan is about 650 Tonnes per day. About 95 % of produced milk is delivered to dairy factories of which 52 % is provided by the Dairy Breeders Association located in Zarqa region in the eastern part of the country and 16 % comes from big dairy farms that own their dairy factories. Individual dairy farmers deliver 32 % of processed milk. About 92.7 % of delivered milk comes from dairy cows, while the rest comes from sheep and goats. Milk from sheep and goat is basically processed to white cultured cheese and Jameed.

ISIC-Cd.	Economic Activity	Gross output (1000 JD)	Intermediate Consumption (1000 JD)	Gross value added (1000 JD)	Compensation of employees (1000 JD)	No. of employees (No.)	Gross value added per employee (in JD)	Average annual compensation per employee (in JD)
1511	Production processing of meat	333,653	259,661	73,992	26,229	5,899	12,543	4,449
1513	Prod. Preserving of fruit & vegetables	79,359	58,379	20,980	6,823	1,532	13,695	4,504
1514	Man. of vegetable & animal oils & fats	218,954	147,399	71,555	4,367	940	76,137	5,301
1520	Man. of dairy products	144,451	98,928	45,523	13,838	4,367	10,423	3,690
1531	Man. of grain mill products	106,365	89,336	17,029	5,104	1,155	14,742	4,936
1533	Man of prepared animal feeds	93,327	72,245	21,082	2,695	793	26,591	3,728
1541	Manufacture of bakery products	279,469	198,051	81,418	38,447	13,204	6,166	3,531
1543	Man. chocolate & sugar confectionery	72,815	57,346	15,469	5,896	1,785	8,666	3,514
1549	Manufacture of other food products	126,131	82,533	43,598	11,066	2,994	14,560	4,629
1551	Distilling of spirits & alcohol production	68,622	22,881	45,741	4,933	553	82,690	8,918
1554	Man. of soft drinks & mineral waters	226,674	134,222	92,452	22,055	3,738	24,736	6,050
15	Man. food products and beverages	1,749,820	1,220,981	528,839	141,453	36,960	14,308	4,300
Α.	Total industry	10,558,209	6,427,193	4,131,016	860,065	184,441	22,397	5,367
н.	Total Economy	22,619,843	11,647,803	10,972,040	3,166,316	954,965	11,489	4,212
	% to industry	16.60 %	19.00 %	12.80 %	16.40 %	20.00 %		
	% to National Economy	7.70 %	10.50 %	4.80 %	4.50 %	3.90		

Table 15: Main economic indicators of Food and beverage industry in Jordan, 2009

4.4.8 Privatization of agricultural services

In Jordan, extension services are provided by a multi-organizational system. Public organizations include the Ministry of Agriculture (MOA), and the Agricultural Credit Corporation (ACC). The MOA provides extension services through the Department of Extension in the National Center for Agricultural Research

⁹⁹ The Industry Survey, 2007, Department of Statistics.

¹⁰⁰ DOS, 2011.

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and Extension (NCARE), and through production-oriented projects in the context of the agricultural development approach. The ACC follows the system of controlled credit and provide technical guidance to the borrowers. Although extension services offered by the private companies are sales-oriented and spatially limited to areas with commercial farming, they are better in quality and more effective.

The private consultants provide technical information to specialized farms (e.g. apple farms). NGOs provide technical and financial support to rural poor areas, and to women farmers. Extension services are provided through cooperatives and Farmers' Union, but their services are limited in size and scope¹⁰¹. Countries, and is taking a bigger role in agricultural research and extension such as Jordan¹⁰².

Partnership with the private sector has to be established to capitalize on the comparative advantage of each sector to create a more sustainable extension system, and the agricultural policy supports such partnership. Full privatization of extension is neither feasible, nor desirable as the majority of farmers in Jordan are small. Private firms can profitably collaborate in the provision of extension to commercial farmers, improve coverage, and test appropriate technologies with farmers. Public extension programs are needed for small and women farmers, animal herders, and for programs that increase public benefits. Publicly funded extension can supply information which helps users to compare and validate information on technologies and practices promoted by the private firms.

4.5. The Agricultural Institutions, Stakeholders and Administrative Bodies

Jordan's agriculture sector significantly contributes to the water crisis in Jordan through high water allocations to this sector, overuse, and pollution of surface and groundwater. Over the last thirty years, there has been an increase in irrigated highland area, along with a parallel increase in permanent crops such as fruit trees. Current irrigation methods are responsible for significant water waste, partly due to the continued use of traditional irrigation systems despite parallel widespread adoption of more efficient drip technologies. Irrigation water loss also arises from leakage in transport and percolation and evaporation either during transport or on the field.

There are many agencies responsible for water management and supply in Jordan: The Ministry of Water and Irrigation (MWI), the Water Authority of Jordan (WAJ) and the Jordan Valley Authority (JVA), Ministry of Health, Ministry of Agriculture, Ministry of Environment, Many water experts and NGOs in Jordan argue that the overlapping of responsibilities between the these agencies results in lack of cohesiveness and a lack of integration of efforts. Non-existent team work and limited communication between the agencies inhibits the implementation of an effective water demand management policy in Jordan

4.5.1 Public Institutions

4.5.1.1 The Ministry of Agriculture (MOA)

The Ministry of Agriculture provides a very wide range of services in support to the agricultural sector. The Ministry is primarily responsible for designing and implementing agriculture sector policies (crops, livestock, forestry, water harvesting, etc.), and for providing technical assistance and extension services (e.g. through NCARE) and rural financing (e.g. through ACC). For example, the office of the Assistant Secretary General for Projects focuses on food security and water

¹⁰² MOA, 1997

¹⁰¹ (Rimawi and Arabiat, 1998

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harvesting projects, where is the office of Assistant Secretary General for Information and Marketing looks after ICT, International Cooperation, Marketing and Borders. Also there are Assistant Undersecretaries for each of the crop, livestock, rangeland& forestry subsectors as well as Assistant Secretary General responsible for the outreach offices in the governorates.

The Office of the Minster of Agriculture is directly responsible for semi-autonomous organisations such as National Center for Agricultural Research and Extension (NCARE) and the Agriculture Credit Corporation (ACC). NCARE, in association with the MOA offices in the Governorates, is responsible for the delivery of agricultural extension inputs and advice to Jordanian farmers. Also NCARE is the only government agency involved in agricultural research. The universities (University of Jordan and the University of Science and Technology (JUST), Jarash University, Mutah University and Al Balqa' Applied University) carry out research on agriculture but play a minor role in technology transfer or extension services. The Faculties of Agriculture offers teaching to both undergraduate and graduate students in the fields of agronomy, horticulture, animal production, nutrition and food industry, agriculture economics and extension. The Jordanian Agricultural Engineers Association established a training program for new agriculture graduates, many training courses are offered at the universities and the training center at the Jordanian Agricultural engineers association and other specialized private training centres.

4.5.1.1.1 The National Centre for Agricultural Research and Extension (NCARE)

NCARE serves as a reference center for conducting applied agricultural research and disseminate the results in order to achieve comprehensive and sustainable agricultural development. NCARE adopts the latest research findings from local and other sources for improving agricultural production, conservation, preservation, and sustainable use of natural resources to achieve food security and maintain ecological balance. NCARE establishment goes back to the late 1950's, when the Department of Research and Extension has been created. In 1985, the research activities have been separated from the Department and enrolled under a new research center "The National Center for Agricultural Research and Technology Transfer. NCARTT", and became a semi-autonomous institution in 1993.

With the limited agricultural resource base, further agricultural development will have to be based on more efficient use of resources and the adoption of improved practices to achieve higher productivity. Research is conducted by several institutions specifically associated with agriculture and also at universities. Research has, under the agriculture restructuring program, been centralized in the National Center for Agricultural Research and Extension (NCARE). The bulk of research is centred on crop and livestock development through hybrids, genetic engineering, production techniques, and such. There is missing link between the research activities and transfer of technology to farmers due to poor limited extension services. Therefore, promoting applied research and improving the extension services should be given high priority by the government.

4.5.1.1.2 Agricultural Credit Corporation (ACC)

ACC is the official and specialized source of agricultural credit. It contributes to agricultural development by funding agricultural projects for farmers as means to implement the national strategy of agricultural development as well as contributing to mitigating burdens of agricultural risks. ACC focuses its support to farmers in the rural areas and the Badia to curb poverty and

unemployment by establishing income generating projects and create new job opportunities as well as achieving sustainable development. The volume of loans in 2011 reached 28.6 million JD of which 7.6 million JD were based on the Islamic lending system (Murabaha).The Agricultural Credit Corporation (ACC) is the sole institutional source of formal credit to both individual farmers and members of village cooperative societies. ACC is a government-owned corporation and not a bank: its current activities are confined to providing credit for agricultural production and development and investing in agricultural companies.

ACC's operations are sustainable and its financial interest is protected because of a system of salary deductions from guarantors. Jordan's financial institutions, including ACC, are at present not geared to servicing small scale producers who, apart from the problem of easy access, often find it difficult to meet credit terms and conditions, particularly relating to collateral requirements. This void is being filled, on a limited scale, by some local and international Non-Governmental Organizations (NGOs) who have been successful in operating micro-credit programmes for the benefit of both urban and rural poor.

4.5.2 Ministry of Water and Irrigation (MWI)

MWI is the official body responsible for the overall monitoring of the water sector, water supply and wastewater system and the related projects, planning and management, the formulation of national water strategies and policies. Its role also includes the provision of centralized waterrelated data, standardization and consolidation of data. In 1988, the Ministry of Water and Irrigation (MWI) was created bringing The Water Authority of Jordan (WAJ) and the Jordan Valley Authority (JVA) under one umbrella. MWI, WAJ and JVA each has an independent Secretary General who reports directly to the Minister of Water and Irrigation.

4.5.2.1 The Jordan Valley Authority (JVA)

JVA is responsible for the socio-economic development of the Jordan Rift Valley, water development and distribution of irrigation. Jordan Valley Authority (JVA) was established in 1977 according to Law No. 18 of 1977, amended by Law No. 19 of 1988 and later amended by Law No. 30 of 2001 with the mandate to carry out integrated socioeconomic development of the Jordan Valley area - then defined as extending from the Northern border of the Hashemite Kingdom of Jordan in the North to the Northern tip of the Dead Sea in the South; the Jordan River to the west and all areas in the Yarmouk and Zarga basins that lie below the 300m contour line to the East; plus any areas the Cabinet appropriates to JVA. In the same year, the area was expanded by the Cabinet to include the territory lying between the Northern tip of the Dead Sea in the North and the Northern border of the Aqaba Municipality in the South; and from the 500m contour line to the East and the Kingdom's border to the West. The JVA was a pioneering regional development authority; it was given a broad range of functions related to land and water development as well as planning and development of social infrastructure such as roads; domestic water supply, electricity, and telecommunications systems; and planning and laying out towns and villages. JVA had completed many of these tasks, and its legislation was amended in 2001 to remove functions related to the development of social infrastructure such as roads, electricity, domestic water supply and telecommunications, as well as responsibilities related to town planning and development. Important tasks which remain with the Authority include operation and maintenance of irrigation systems, and land allocation and administration (Figure 16).



Figure16: The Area of JVA Responsibility

4.5.3 Ministry of Planning and International Cooperation (MOPIC)

The MOPIC is responsible for coordinating ODA and poverty reduction support from partners as well as GOJ own resources. MOPIC staff is trained in economic development policies. Of relevance is MOPIC's Enhanced Productivity Centres Programme (ERADA), which provides support to rural entrepreneurship initiatives. ERADA plays an important role is coordinating social and economic
productivity initiatives through its Social Productivity and enhanced productivity projects (SPP and EPP).

MOPIC coordinates and directs developmental efforts through planning, execution, monitoring and evaluation of social and economic development plans, in coordination with the public and private sectors, and civil society organizations, as well as to enhance economic, financial, and technical cooperation with various countries and international organizations in order to achieve sustainable socioeconomic development and a better standard of living for all Jordanians.

4.5.3.1 Jordanian Cooperative Cooperation (JCC)

JCC is in charge of the cooperatives from all sectors including agriculture. Out of 1361 cooperative only 800 are active, and out of the total registered cooperatives about 30-35% have agriculture and related functions. According to JCC reports, the present legislation is not compatible with the needs of the cooperative sector, one reason is that the law currently in effect is solely for the JCC and does not serve the cooperative sector in general. JCC itself suffers from inadequate administrative, technical and financial capabilities. JCC cannot respond to solve problems such as the inadequate competition between the cooperatives themselves and the cooperatives and the private sector. Also JCC cannot respond to the risks involved in agriculture, nor could it control the related regulatory measures

4.5.4 The Ministry of the Environment (MOE)

The General Corporation for environment protection was established 1995 in response to the Jordan Environment Law No. 12, in a governmental attempt to unify and coordinate responsibilities and efforts being undertaken in the field of the environment. Later, the Ministry of Environment was established in 2003 under the Environment Protection Law No. (1) Of 2003, this was approved by the Parliament and has become the Environmental Protection Law No. (52) of 2006. The Ministry of the Environment (MOE): MOE is responsible for implementing Jordan's commitments to the international agreements concerned with the environmental wellbeing (biodiversity, desertification, environmental protection, soil and water issues, carbon incentives etc.) There is coordination between MOA and MOE through the department of Rangeland and Badia Development and the Forestry Directorate on environmental issues through common technical and steering committees. A major new program expected to have an impact on the environment is the Badia Ecosystem Restoration Program (BRP) which is being coordinated by MOE and mostly implemented through the MOA. The Ministry seeks to maintain and improve the quality of Jordan's environment, conserve natural resources and contribute to sustainable development through effective policies, strategies, legislation, monitoring and enforcement and by mainstreaming environmental concepts into all national development plans. MOE implemented several water related projects such as integrated watershed management in Jerash.

4.5.4.1 The Badia Ecosystem Restoration Programme (BRP).

This recently launched Programme will develop a holistic long-term community driven approach that incorporate the linkages between livestock, water, soil, grazing and supplementary feed resources, while considering income-generating activities such as ecotourism, forest products, honey, high value medicinal and herbal plants. The Programme will conduct extensive community training and capacity development activities, and is envisaged to strengthen extension and technology transfer. A major task of the program is to deal with the land tenure system in a fashion that does not contradict with the laws, but provide the Badia dwellers the incentive to manage and protect the rangeland resources. One major innovation sought by the BRP is the devolution of the full responsibility of managing and improving the fragile Badia resources, a pursuit that must be supported by favourable policies and legislations.

4.5.5 Ministry of Finance

The Ministry of Finance (MOF) Budget Department oversees the allocation of budgets to the agriculture sector in accordance with government rules and regulations. The Ministry is also involved in the finance of projects and the payment of local and international loans.

4.5.6 Other Public institutions

Other Ministries and public institutions that directly or indirectly impact on the performance of the Agriculture Sector are: Ministry of Industry & Trade (MIT), Ministry of Social Development (MSD), Ministry of Labour (MOL) the Ministry of Health (MOH) and the local governments.

4.5.6.1 Jordan Badia Research and Development Program (BRDP)

The BRDC is a unique center of research, integrated management, community development and environmental conservation of the Jordanian semi-arid area known as the Badia. The BRDC is a product of a partnership between the Higher Council of Science and Technology in Jordan, and the Royal Geographical Society in the UK and Durham University.

4.5.7 Civil Society Organisations (CSOs), Parastals, NGOs and Cooperatives

4.5.8 Water User Associations

In 2001, the JVA start a cooperative program through participatory irrigation management in the JV. It also embarked on a program of establishing Water Users' Associations (WUAs) across the 32, 000 hectares of irrigated land in the Valley. This effort followed the gradual decrease in tertiary level distribution efficiency as a result of deferred maintenance and network deterioration, growing farmer dependence on the JVA to solve problems, and a lack of cohesion and cooperation among farmers at the tertiary level. Recognizing the difficulty of the task, the partners designed a nine-year process to build confidence among farmers, establish WUAs, and transfer management tasks to the WUAs.

By 2010 about 80% of this area was served by 22 WUAs, each covering an irrigated area of, on average, 700 to 1,000 hectares. However these existing WUAs function at differing levels of effectiveness, and they are handicapped in taking on new responsibilities by the absence of legislation allowing then to be established as legal personalities. Moreover GIZ is in the process of phasing out its assistance to the WUA program. It is necessary to strengthen and fully empower Jordan Valley Water User Associations (WUAs) through revised legislation and building trust and capacity in their operations in order to continue the process of transferring tertiary-level operational responsibility to the WUAs. The Jordan Valley Authority already transferred some

responsibilities for distributing water among farmers to a set of the farmer-based organizations— WUAs—covering the entire irrigated area of the Valley.

4.5.9 The Royal Society for the Conservation of Nature (RSCN)

The Royal Society for the Conservation of Nature aims to conserve the biodiversity of Jordan and integrate its conservation programs with socio-economic development, while promoting wider public support and action for the protection of the natural environment within Jordan and neighbouring countries. RSCNs socio-economic projects include a wide variety of eco-tourism programs, as well as the production of unique handicrafts and organic food items. These nature-based businesses provide jobs tied to the protection of natural areas and create improved livelihoods for poor rural communities.

The Royal Society for the Conservation of Nature is an independent non-profit non-government organization devoted to the conservation of Jordan's natural resources. Established in 1966 under the patronage of His Majesty the late King Hussein, RSCN has been given the responsibility by the Government of Jordan to protect the Kingdom's natural heritage. As such, it is one of the few voluntary organizations in the Middle East to be granted this kind of public service mandate.

4.5.10 Jordan Agricultural Engineers Association

The association was established in 1966 with the main goals of regulating the practice of the profession; supporting scientific research and inventions to raise scientific and professional levels, participating in planning and organising agricultural, educational and training programmes on all levels, participating in drafting agricultural policies and the means of its implementation, suggesting agriculture-related laws and regulations, defending and protecting the rights of the association and its members, supporting scientific research Centres, especially in the field of agriculture, securing decent life for the members and their families in cases of physical disability, elderly, death, or any other cases and cooperating with agricultural engineers associations in the Arab countries in order to raise the level of the profession.

4.5.11 Jordanian Veterinary Association

The association was established in 1972. This well organized keeps record of all Jordanian Veterinarians inside and outside the country. The Association boosts a membership of 1351 veterinarians (58 deceased) with a significant number (569) is employed in the private sector. The Association caters very effectively for the needs of the profession and its members in accordance with its goal of regulating the practice of the profession, enhancing scientific and professional levels of the members, maintaining ethics and traditions of the profession and protecting members' rights, providing health insurance for members and their families; in addition to decent life in cases of physical disability, elderly, or death within the limits of valid regulations, participating in making and implementing policies concerning livestock, raising the level of veterinary services in cooperation with concerned ministries and institutions, participating in planning veterinary educational and training programmes. Activating and supporting researches, studies, and inventions in the field, issuing magazines and bulletins and establishing useful libraries to assist doctors and networking with Arab and international veterinary associations, and exchanging experiences and publications with them

4.5.12 The Jordanian Hashemite Fund for Human Development (JOHUD)

JOHUD is a non-governmental organization dedicated to promoting rights-based sustainable human development in Jordan and in the region. Established over thirty years ago, JOHUD reaches out through a network of 50 community development centres to reach people in underserved, poor and remote communities. JOHUD initiated The Natural Resources Management Program (NRMP) to reduce poverty and achieve sustainable growth through implementing agricultural development projects. The NRMP goal is to Increase food security, improve land and water conditions and reserve the country limited natural resources by agricultural empowerment for local communities in both household level and community based organization (CBOs) level which will ensure the long-term economic viability of agriculture for the targeted areas.

4.5.13 The National Alliance against Hunger and Malnutrition (NAJMAH)

The Alliance was established under the leadership of Her Royal Highness Princess Basma in 2004 to support government programs in combating hunger and enhancing food security in Jordan. The alliance which is hosted by JOHUD, works with the Ministry of Agriculture, the World Food Program (WFP), the Agricultural Credit Corporation and the Food and Agriculture Organization among others in formulating policies and projects. Among other objectives of the alliance, there is a strong emphasis on the agricultural development to solve the problems related to hunger and enhancing food security.

4.5.14 Jordanian Farmers Union (JFU)

The union was established in accordance with law number 19 for the year 1997 as an autonomous not for profit civil society, aiming at unifying farmers efforts and enabling the largest number of them to actively participate in achieving JFU objectives and to defend farmers interest and provide them with the services in order to contribute to the development of agricultural sector.

JFU has branches in all governorates in addition to the Jordan valley and authorized to deliver services and commercial business to its members and non-member farmers. It has nationally elected board and boards also elected in each branch. JFU is still in the infancy stage; its members are limited and lack the proper financial resources

5. International Partners in the Agricultural Sector

Jordan developed diversified partnerships at multilateral, regional and bilateral levels by participating in global and thematic policy and scientific fora, by adhering to multilateral agreements and by establishing and implementing cooperation strategies with multiple partners. The present section describes the commitments and cooperation platforms relevant to the agriculture sector.

5.1. Multilateral Partners

- United Nations development Assistance Framework (UNDAF)¹⁰³

The UNDAF is the strategic tool for cooperation between Jordan and the United Nations. The UNDAF is based on national priorities as identified in the National Agenda as well as the Millennium Development Goals (MDGs). The Priority themes for inclusion in UNDAF 2013-2017 (Box 5) will focus on a few elements, which correspond to the UN country team's comparative advantages.

Box 5: Priority themes for inclusion in UNDAF 2013-2017:

Enhancing Systemic Reform: Institutional reform, decentralization, strengthening people's participation capacity, improving transparency and accountability to be pursued with a view to improve the performance of political, economic social, administrative systems and processes.

Ensuring Social Equity: A reinforced focus on development of the human capital including towards enhanced productivity, human rights promotion, (in particular for women and children), decentralized planning to reduce disparities between governorates, genders and less advantaged groups, and acceleration of progress towards the MDGs.

Investing in Young People: A holistic approach to addressing the health, education, employability, civic engagement, and protection issues of various sub-groups within this large population, which will be entrusted with determining the country's future coping capacity, sustaining its progress and ensuring its security.

Preserving the Environment: Integrated water resource management, renewable energy, transition to a green economy, sustainable tourism, community-based conservation and sustainable use of ecosystem, adaptation to climate change and youth entrepreneurship in environmental excellence and disaster risk reduction.

Source; UNDAF Jordan Country Assessment 2011

The objectives of any of the selected priorities would best be met by ensuring due attention to an adequate level of integration of gender equality, age differential and localized approaches, in addition to attention paid to the most marginalized groups and fostering the participation of community groups in local development initiatives.

In accordance with UNDAF, specific UN agencies are developing their country programmes based on their specific mandates and competences and on their past programmes in Jordan. These are described below.

FAO¹⁰⁴

Has carried a mission in Jordan in January 2012 for developing its new Country Programming Framework (CPF) which is expected to (i) Assist MOA in the preparation and update of the medium and long term agricultural development strategy, and (ii) Flow in the on-going formulation of the UNDAF as well as on other initiatives being undertaken by other multilateral and bilateral partners, including the EU.

FAO, in coordination with its regional office in Cairo and with technical departments in Rome, is currently implementing¹⁰⁵ several national and (mostly) regional programmes on a wide range of issues that include: the development of a national Agricultural Information System (NAIS),

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¹⁰³ Source; UNDAF Jordan Country Assessment 2011

¹⁰⁴ FAO Country Programming Framework – End of Mission Information Note January 22, 2012

¹⁰⁵ Sources: Field Programme Management Information System (FPMIS) <u>www.fao.org</u>; FAO Strategic Frame work 2000-2015; Underutilized Species in Jordan Polices and strategies 2006; OECD – FAO Agricultural Outlook 2008-2017.

promotion of conservation agriculture, sustainable use of water and energy resources for agriculture, adaptation to climate change, management of invasive plant species, strengthening of veterinary services, regional integrated pest management (IPM) and Obsolete Pesticide Management (POP). In these domains, FAO provides policy advice, capacity development and technological transfer. Jordan is a member of the FAO-supported Regional Commissions for Near East and North Africa (NENA) on Animal production and health, Plant Production & Protection, land & Water and Forestry.

- IFAD¹⁰⁶:

IFAD is about to finalise its Country Programme Evaluation¹⁰⁷ (CPE). The CPE considers two potential areas for lending services i) pro-poor rural micro-finance; ii) support small livestock households/ and farmer organisation to achieve sustainable and profitable production systems. The outcome of the CPE will assist IFAD (Near East and North Africa Division) to develop its new Country Strategic Opportunity Programme (COSOP) for the period 2013-2017. In addition, options for non-lending services are expected to focus on policy dialogue, knowledge transfer and promotion of partnerships.

The latest programmes of IFAD in Jordan have been the National Programme for Rangeland Rehabilitation and Development – Phase I, the Yarmouk Agricultural Resources Development, the Agricultural Resource Management Project – Phase II and the participation of Jordan in IFAD regional programmes.

WFP

WFP has been active in Jordan since 1964¹⁰⁸ (e.g. the highland Development Project) providing capacity building support to the MOA in monitoring and evaluation and statistics related to food supply and supporting the GOJ in its poverty pockets programme. WFP last food security assessment was carried out in 2008. In 2010, WFP conducted a supply chain analysis of wheat flour in Jordan for the Ministry of Industry and Trade¹⁰⁹. The aim was to address the shortcomings and areas of concern that the government believes are in need of improvement. The study focused mainly on the supply chain of wheat and other basic food Commodities in Jordan.

- UNIDO

UNIDO is utilizing the results of a recent evaluation of the Agro-Industry Sector¹¹⁰ in developing a project proposal (Strengthening Agro-food business in Jordan) that aims to enhance the competitiveness of Agro-industrial sector in Jordan.

- UNDP¹¹¹:

UNDP has been in Jordan for over 30 years. The major relevant themes of involvement at present are climate change and the environment and poverty reduction within the MDG framework. Currently UNDP, in cooperation with MOA and other key relevant government institutions, is involved in developing a joint programme on food and nutrition security. Also, UNDP is providing

¹⁰⁶ Source: <u>www.IFAD.org</u>

¹⁰⁷ Sources: Meeting IFAD Evaluation Office , Independent Evaluation Office (IOE) ; and with the Country Programme Manager , Programme Management Department (PMD) in IFAD headquarters in Rome

¹⁰⁸ Mission Briefing by Deputy Director and Director of WFP Office in Amman Jordan

¹⁰⁹ WFP & Ministry of Industry and Trade; Supply Chain Analysis of Wheat Flour in Jordan, 2010

¹¹⁰ Source; FAO Country Programming Framework January 2012

¹¹¹ Source: <u>http://www.undp-jordan.org/</u>

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policy and technical support to MOA and the recently established intergovernmental food security committee to develop and implement a new national Food Security Strategy.

The Strategic Vision for UNDP in Jordan (2009-2012) focuses on Poverty Eradication and MDGs; Climate Change & Environment Crisis Prevention and Management, Aid Coordination and Management. UNDP is currently implementing its strategic vision for the period 2009-2012 following five pillars among which three are relevant to agriculture, natural resources and rural development:

- 1. **Poverty Eradication and MDGs** that include Food security support, local sustainable livelihoods initiatives and appropriate links with Climate Change and Environment projects.
- 2. **Democratic Governance**: this pillar supports the government in its decentralisation policy empowering local institutions and fostering inclusive participation
- 3. Climate Change & Environment: This pillar has a number of on-going projects that focus on support to the government of Jordan in the implementation of the UN environmental global conventions. These projects include support to: the second national communication to the United National Framework on Climate Change (UNFCCC), adaptation to climate change to sustain Jordan's MDG, water governance, sustainable land management, capacity for the implementation of the 4th National Report to Biological Diversity, energy efficiency standard and labelling in Jordan, and mainstreaming the protection of marine biodiversity, through strengthened coastal management.

- THE WORLD BANK¹¹²:

The World Bank's last agricultural program was the Horticulture Export Promotion Project (2002 -2007)¹¹³. Before that the Bank provided support to the agriculture sector adjustment programme. The pipeline projects envisaged in 2007 focused on social development, enhancement, employment skill development, higher education reform and private participation in infrastructure development. The "Overview of the World Bank Group's Proposed Assistance Strategy in Jordan for 2011-2014" has a provision for supporting Jordan's ability to address the needs of its most vulnerable population through measures to ensure that the benefits of economic development, including the creation of jobs, reach people in the less privileged areas of the country. This year the GOJ requested a 3.3 million JD loan from the WB for the environmental improvements in the Badia (desert area) with the objective of providing livelihoods and promote environmental services to 3 pockets of poverty.

- ICARDA¹¹⁴:

The Consultative Group of International Agricultural Research (CGIAR) is active in Jordan mainly through the International Centre for Agricultural Research in Dry Areas (ICARDA).

ICARD's Regional Office for West Asia has been located in Amman for over three decades. Over the years, ICARDA has built a strong partnership with Jordan agricultural institutions, with other agricultural research centres (CGIAR, and with multilateral (FAO, IFAD, WFP), regional (AOAD) and

¹¹² http://www.worldbank.org/

¹¹³ World bank operations in Jordan 2002 -2012 and pipelines WB Operation report 2007

http://siteresources.worldbank.org/JORDANEXTN/Resources/JO_Data_sheet_07.pdf?resourceurlname=JO_Data_sheet_07.pdf ¹¹⁴ Source: Jordan and ICARDA – Ties that bind, 2008 and <u>www.icarda.org</u>

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bilateral partners (i.e. USAID¹¹⁵). This long term relationship contributed greatly to the advancement of the agricultural sector in Jordan. The collaborative R&D programmes provided the Jordanian professionals with capacities to do research and extension, and to lead a wide range of agricultural development projects that generated long lasting impact on the crop and livestock subsectors as well as on water management and biodiversity conservation.

The R&D and training programmes (Plant Genetic Resources, Germplasm Development, Natural Resources Management, Socioeconomics, Institutional and Policy Research, Special Collaborative Projects) were successful in developing community participation and action planning approaches suited to advancing agriculture practices among the settled irrigated, or rainfed systems as well as the mobile herding communities.

- ICBA¹¹⁶

The International Center for Bio-saline Agriculture (ICBA)¹¹⁷ is a fairly new organization dealing with research exploring the use of saline water in agriculture, a relevant concern to the water deficient Jordan. Limited support has been given through collaborative research between ICBA and NCARE

5.2. Regional Partners118

Jordan is a member of several regional organisations that include inter-governmental cooperation bodies, thematic agencies, research centres and financial institutions. The following are directly involved in agriculture development.

The Arab Organisation for Agricultural Development¹¹⁹ (AOAD)

AOAD was established in 1970 and is based in Khartoum, Sudan. AOAD is one of the specialized organizations functioning under the umbrella of the League of Arab States. The organization's goals are:

- ✓ At the regional level, to facilitate coordination amongst member states in the agricultural sector, with the aim of achieving a fully integrated Arab economy union, and food self-sufficiency.
- ✓ At the national level, to assist member countries in developing and enhancing their respective agricultural sectors.

The AOAD fields of operation and programmes are the following:

- Natural Resources Development and Environmental Protection Program
- Food Security Program
- Improvement of Agricultural Services, Technology Transfer and Adoption Program
- Training and Capacity-building Program

¹¹⁵ USAID is a partner of the Middle East Water and Livelihood Initiative (WLI) - <u>http://www.icarda.org/wli/index.html</u>

¹¹⁶ Source; <u>www.icba.org</u>

¹¹⁷ Source: NCART ICBA-Jordan National Report 2004 Harnessing salty water to enhance sustainable livelihoods of the rural poor in Egypt, Jordan, Syria and Tunisia.

 ¹¹⁸ The data on regional financing institutions is based on OECD AidData (<u>www.aiddata.org</u>)
 ¹¹⁹ Source : <u>http://www.aoad.org/eng/about.htm</u>

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- Technical and Scientific Cooperation Program
- Statistics, Information, Documentation and Publishing Program
- Strengthening the Establishment of the Arab Free Trade Zone Program
- Agricultural Integration and Enhancement of the International Competitiveness of Arab Agricultural Products Program
- Supporting Joint Development Projects Program

- Arab Centre for the Studies of Arid Zones and Dry Lands (ACSAD)¹²⁰

ACSAD) was established in Damascus, Syria in 1968 as a specialized organization aiming to develop agriculture in the arid and semi-arid areas of the Arab region through research and use of modern agricultural techniques.

ACSAD Divisions

- ✓ Water Resources Division
 - Water Resources Development Program
 - Environmental Water Protection Program
 - o Integrated Water Resources Management Program
 - Climate unit Program
- ✓ Soil & Water Uses Division
 - Supplementary irrigation
- ✓ Plant Resources Division
 - Cereal Program
 - Fruit Trees Program
 - Rangeland and Forest Resource Program
 - Plant Biodiversity Program
- ✓ Animal Wealth Division
 - Program of Improving Sheep & Goats production
 - Camel Research and Development Network (CARDN) Program
 - Fodder improvement

ACSAD's support to Jordan's agriculture sector was performed through joint and direct regional and country programmes such as the rangeland ecosystem development in the NE Badia (Hamad) and the GIZ supported Implementation of the UN Convention to Combat Desertification

¹²⁰ Source : www.acsad.org
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The Arab Fund for Economic and Social Development (AFESD)¹²¹

AFSED finances public and private investment projects and provide grants and expertise. AFESD financed several programmes in Jordan since the early eighties to date, providing loans to the benefit of the Ministry of Agriculture and mostly to the Jordan Valley Authority for irrigation and agricultural investments. The Fund supported a number of important Research and Development Programs in Jordan (e.g. Mashreq & Maghreb Programme, Watershed Benchmarking Programme) in cooperation with IFAD and others. The latest has been the Comprehensive Development of Wadi Araba Region that started in 2008. The Jordan Agriculture Credit Corporation (ACC) benefitted in 1985 of a loan of 8.5 million US\$ for supporting credit lines to small farmers.

- OPEC Fund for International Development (OFID)¹²²

OFID financed a number of agriculture projects between 1977 and 2004 at a cumulative amount of \$16.2 million: the North East Ghor Irrigation project in 1977, the IFAD supported Yarmouk Agricultural Resources project in 1999 and the Agricultural Resources Management II project in 2004. More recently support of OFID turned to other non-agriculture sectors.

- The Islamic Development Bank (ISDB¹²³)

After supporting water investments and import of agricultural raw material (cotton) in the eighties, the IsDB provided in 1998 a loan of 25 million US\$ for the Southern Ghors and Eastern Shores of the Dead Sea Programme.

- The Arab Authority for Agricultural Investment and Development (AAAID)

AAAID which is operational from its Khartoum (Sudan) based HQ has 20 Arab countries as members /investors. AAAID has been engaged in several agricultural commercial ventures such as Sugar factories, introduction of agricultural technologies (e.g. zero tillage) and equipment, large scale poultry, seed and livestock companies.

5.3. Bilateral Partners

5.3.1 EU Member States

5.3.1.1 Germany

GIZ¹²⁴, the German cooperation agency, created from the merge of the German Development bank (BMZ) and the technical agency (GTZ) .GTZ was very active between the 1970s and the 1990s in supporting a number of agriculture sector projects and programmes. GTZ which maintained an office in Jordan since 1979 stepped up its activities in the water sector in the early 1990s. As agreed by the German and Jordanian Governments, water – along with water-related environmental and resource protection – became a priority area of cooperation in 2001. In addition, GIZ is implementing various regional poverty reduction and institutional capacity-

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¹²¹ <u>http://www.arabfund.org/Default.aspx?pageId=10&mid=21</u>

¹²² Source : <u>http://www.ofid.org/</u>

¹²³ Source : <u>http://www.isdb.org</u>

¹²⁴ Source : <u>http://www.giz.de/en/worldwide/360.html</u>

building projects, and provides advisory services to the Jordanian Ministry of Finance on the management of public expenditure. Significant support is given by GIZ to Water Resources Management in Jordan featuring activities such as the Water wise women initiative. In addition GIZ supports Jordan through the following regional programmes:

- Promotion of Innovation and Technology for small and medium sized enterprises in Near East
- Regional Cooperation in the Vocational Training Sector
- Support for ACSAD in Implementing the UN Convention to Combat Desertification
- Statistical Cooperation between the EU and Mediterranean Partner Countries (MEDSTAT)

5.3.1.2 France

The French cooperation in Jordan is focused on the water sector. In cooperation with Germany, France provides technical assistance to the MWI on highlands water management and participates to other multi-donors initiatives in the water sector. The French Development Agency¹²⁵ (AFD) is operating in Jordan since 2003. The establishment of PROPARCO, a subsidiary AFD support to the private sector, was signed in November 2004. AFD is co-financing with the World Bank the Regional and local development programme, and the French Global Environment Fund (FFEM) is financing the preliminary studies (feasibility and environmental & social impacts assessment) of the Red Sea – Dead Sea water transfer initiative

5.3.1.3 Italy

Over the last ten years, the Italian government funded 10 projects for a total amount of 88 million Euro, of which 45% in the water sector with a focus on water supply, water treatment and sanitation infrastructure. The rest of the cooperation portfolio is devoted to support small and medium enterprises, vocational training, health, tourism, cultural cooperation and emergency projects. At a recent announcement of the senior Jordanian and Italian officials (December 2011) the two countries agreed to take several steps to build new partnerships and increase economic cooperation between the two states. One example was signing of a memorandum of understanding between the Italian Institute for Foreign Trade and the Jordan Enterprise Development Corporation (JEDCO).

¹²⁵ Source : <u>http://www.afd.fr/home/pays/mediterranee-et-moyen-orient/geo/jordanie/afd-jordanie</u>

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5.3.2 The United States Agency for International Development (USAID) 126

USAID supported the agricultural sector in Jordan for over many years. For example the agency provided substantial support to the establishment of NCART, and to the first agricultural policy implementation plan. USAID Mission in Jordan was not engaged during the past 5 years in any specific work in the agricultural sector¹²⁷. However there are recent initiatives supporting water resource management in Jordan:

- The recently approved Middle East Water & Livelihood Initiative (WLI) which is being implementing through the assistance of ICARDA and five USA land-grant universities. One of the watershed sites where the project operates is the Muhareb Benchmark site located in the transitional Badia (30 KM southeast of Queen Alia Airport). An interesting (and useful to the EU Mission) is the stakeholder analysis conducted by WLI at a Workshop in Amman (May 2009); the aim of the USAID Institutional Support and Strengthening Program (ISSP) in Jordan is to identify realistic recommendations for the strengthening and support of Jordan's water sector institutions and other related bodies. The program is expected to contribute directly to Improved Environmental Protection, Optimization of Water Resources, and Strengthened Water Policies and Systems by improving the ability of GOJ institutions and the private sector to effectively manage diminishing water resources;
- USAID support to Bee honey research and development through NCARE continues through the Bee Honey Research Support Program (2003 present)
- An earlier USAID involvement was study on Land tenure and Property Rights (2007) conducted as part of a regional project.

5.4. MULTILATERAL AGREEMENTS

5.4.1 Trade Agreement

2000: The accession of Jordan to the World Trade Organization (WTO) in April 2000 and the ratification of the EU-Jordan Association Agreement in May 2002 as measures to support the country's trade liberalization prospects.

5.4.2 UN Environmental Agreements

- 2001: Conservation And Sustainable Use Of Biological Diversity In Jordan First report on the implementation of the UN Convention on Biological Diversity (UNCBD)
- 2006: Stockholm Persistent Organic Pollutants (POPs) Convention in Action in Jordan Land and Human to Advocate Progress (LHAP)
- 2007: Third Country Report On The Implementation of the United Nations Convention to Combat Desertification (UNCCD)
- 2009: Fourth National Report On Implementation Of The Convention On Biological Diversity In Jordan
- 2010: National environmental and economic development study for Climate Change

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¹²⁶ Sources: <u>www.usaid.gov</u>; USAID Regional Project Report – Land tenure and Property Rights (2007); Middle East Water and Livelihoods Imitative (WLI) ;Water & Livelihood Initiative (WLI) Planning Workshop for Rangeland Benchmark Sites 2009;Water & Livelihood Initiative (WLI) Jordan Muhareb Benchmark 2011;USAID Institutional Support and Strengthening Program (ISSP), Jordan

¹²⁷ Information obtained during the visit of the TL to the USAID Mission in Amman in April 201 as part of the activities of IFAD PPA for the NPRRD and the CPE for Jordan.

992: Jordan and UNFCC signed agreement and ratified it in November 1993. The Convention entered into force in 1994.

Jordan's adherence to multilateral environmental agreements (MEA) is summarized below.

MEA	Signature	Ratification	Entry into force
UNFCCC	1992	1993	1994
UNCBD	1992	1993	1993
UNCCD	1994	1996	1997

	Table 15:	Jordan's	environmental	agreements
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5.4.3 UN Framework Convention on Climate Change (UNFCC)

Following the entry into force of the Convention, Jordan initiated, with the support of UNFCCC Secretariat, a long process of analysis and consultations with multiple stakeholders and international partners in order to assess the country vulnerability to CC and to identify the information and financing needs to implement mitigation and adaptation measures and to integrate them with the national plans. This process materialized in the elaboration in 2010 of the National Economic and Environmental Development Study (NEEDS¹²⁸) for Climate Change that forms the baseline for actions plans and further updates.

While energy and waste management were identified as the main sectors for mitigation measures, water resources and agriculture are the main sectors where adaptation measures are urgently required. Based on several scientific research and projections, the estimated reduction (20 to 40%) in surface and ground water resources availability will strongly affect natural resources and the agricultural sector in its different agro-ecological systems: (i) rainfed agriculture with field crops (wheat and barley) and fruit trees (olive), (ii) arid and semiarid rangelands and the associated livestock production, as well as (iii) irrigated agriculture.

Based on the vulnerability assessment, the following priority projects were proposed up to 2020:

- Growing perennial forages in the Badia region;
- Development of water harvesting techniques in agricultural and rangeland areas;
- Enhancement of irrigation efficiency through fertilized irrigation;
- Rehabilitation of forest, rangeland and desert areas;
- Agricultural sustainability in the Petra region;
- Development of early warning systems for drought and floods.

The cost of such projects was estimated at 308.6 million US\$. These projects and others have been included in the national sector programmes and partially implemented.

5.4.4 UN Convention on Biological Diversity (UNCBD)

In its first report to the UNCBD submitted in 2001, Jordan made an assessment of the impacts of conventional agriculture production on biodiversity highlighting the risks of degradation of soil quality and ecology, the waste and overuse of water resources, the pollution of terrestrial and aquatic ecosystems and the decline of natural and agricultural biodiversity and genetic resources.

¹²⁸ The NEEDS report is available at <u>http://unfccc.int/files/adaptation/application/pdf/jordanneeds.pdf</u>

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In response to these threats, a National BD Strategy and Action Plan were released in 2003. The strategy acknowledges that land, water, pasture, terrestrial and marine ecosystems as well as wildlife and aquatic resources are central to agriculture, fisheries and tourism development. It also recognizes that habitat protection, natural resource conservation and sustainable use options offer significant opportunities for demonstrating that conservation of biodiversity represents a vital investment in future sustainability of Jordan's economic and social development. The strategy defined the following priority objectives and actions:

- Enhance knowledge on plant and animal biodiversity and their relations with agricultural and livestock production;
- Promote and valorise agricultural diversity and genetic resources adapted to drylands;
- Develop integrated land use planning mechanisms;
- Protect agricultural land from fragmentation and urban encroachment;
- Improve rangeland management by developing alternate feed sources in the Badia region and rationalizing grazing practices;
- Rationalize the use of irrigation water and protect aquatic ecosystems (rivers, wetlands, etc.);
- Monitor the impact of diseases on animal productivity;
- Establish green belts to combat desertification;
- Promote low inputs cultivation such as organic agriculture and hydroponics culture.

In Jordan's 2009 report¹²⁹ to UNCBD, several achievements are recognised, such as the establishment of the Forestry Seed Center within the Department of Forestation and Forests and of the Genetic Resources Unit at the National Center for Agricultural Research and Technology Transfer of the Ministry of Agriculture. However, mainstreaming biodiversity in agriculture programmes and practices is still perceived as being low. Moreover, grazing and forest regulations are reported to be poorly enforced making protection measures ineffective.

5.4.5 UN Convention to Combat Desertification (UNCCD)130

Following the adoption of the convention, Jordan initiated in 2002 the process of preparation of a national Action Plan to combat drought and desertification. The National Committee for Combating Desertification (NCCD) has been established; it is chaired by the Ministry of Environment with the participation of relevant partners and aims to integrate UNCCD concerns into existing national strategies and programmes concerning environmental protection, water resources management and agriculture. The National Strategy and Action Plan to Combat Desertification was finalized and launched in 2006. Although the NAP requires effective awareness and a resource mobilization strategy, it is considered as a framework for action built on six priority programmes:

- 1. Desertification Information System (DIS),
- 2. Drought prediction and Desertification control,
- 3. Capacity building and institutional development,
- 4. Restoration of degraded ecosystems of rangelands and forests,

¹²⁹ Fourth National Report To The Convention On Biological Diversity Jordan 2009

 ¹³⁰ Source: Third Country Report on The Implementation of the United Nations Convention to Desertification, 2007
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- 5. Watershed management,
- 6. Human, social and economic development initiatives.

Several programmes contributing to the objectives of the Convention have been implemented by Jordan with the support of different national and international partners. Implemented initiatives addressed both the causes and effects of land degradation with a focus on protection and rehabilitation of rangelands and forest ecosystems, conservation of soil and water resources, monitoring of drought and desertification processes, introduction of sustainable farming systems and improved livelihood of vulnerable communities.

Jordan is also a member of the Sub Regional Action Programme to Combat Desertification in West Asia region (SRAP-WA) and benefits from effective sub-regional cooperation in addressing common problems and in promoting experience and innovation sharing between stakeholders, particularly on two key issues common to the countries of the region, namely sustainable management of water resources and vegetation cover of forest and rangelands. As a result of such regional cooperation, a project database on water resources was developed by the International Centre for Agricultural Research in the Dry Areas (ICARDA) and another on vegetation cover was developed by the Arab Centre for the Studies of Arid Zones and Dry Lands (ACSAD).

6. The Challenges of Agriculture Sector in Jordan

The EU-Study Team conducted intensive focus group discussions with farmers in all of the representatives AEZs and crop/livestock forming systems, met with relevant stakeholders including public sector, private sector, CSOs, NGOs and representatives of the international and regional partners. Following these extensive discussions and visits, the Team conducted a comprehensive analysis of the problems, constraints, strength, weaknesses, opportunities and threats (SWOT analysis) of the agricultural sector as a whole and its major subsectors (agronomic crops, horticultural crops, livestock, industrial crops). This was followed by a one day feedback and validation workshop involving the major agriculture value chain stakeholder categories i.e. politicians, decision makers, academicians, farmers, NGOs and CSOs. The workshop participants¹³¹ were introduced to the results of the Teams SWOT analysis at a plenary session, before breaking away into 5 groups. The Working Groups took into consideration the results of the Team's SWOT analysis, but presented at the plenary conclusions which reflected to indecent view of each group. In addition to the group presentations the second plenary discussed draft recommendations issued raised by the Team

The results and recommendations of the SWOT analyses (Team and Stakeholders) and the recommendations discussed at the plenary session of the validation stakeholder workshop are included in annex 2, 3 and 4.

The following are the major challenges/ issues concluded from the SWOT analyses and workshop results:

6.1. Challenges/ issues related to the natural resource base

a. <u>The gradual decrease in the agricultural water</u>

Jordan is classified among the water poorest countries in the world, furthermore the ratio and quality of water available to agriculture is continuously declining, major factors attributed to this are:

- Low precipitation as a result of the climate change, the average annual rainfall is declining and drought is becoming more frequent.
- Insufficient water harvesting and collection measures of the national, watershed and farm levels.
- Misuse of irrigation water and over pumping of ground water resources which ultimately affect the availability, returns and quality of agricultural water.
- Increasing population and competition over water by other sectors.
- Ineffective water policy and strategies and poor coordination between the concerned institutions

The followings are the direct effects and impacts of water shortage and misuse:

- Less agricultural production, productivity and farmer's income

¹³¹ More than 80 participants attended two plenary sessions and participated in 5 break-away Working Groups Draft Final Report – Volume 1 – Specific Contract N° 2011/278635 – version 1

- High cost animal and crop of production
- Increasing conflict over water rights and allocation
- Decreased investment in agricultural
- Abandonment of agriculture and getting rid of the land to be used for other purposes

b. Land fragmentation. For example, the average land holding size was reduced from 63 du in 1991 to 40 du in 2007.

The major causes of the shrinking land holding size are:

- Inheritance laws which results in distribution of lands to several inheritors who either cultivate it together with a common title or distribute it to smaller pieces
- High value of the agricultural land for housing purposes attracts sale to growing industries or urban housing

The direct and indirect effects and impacts of land fragmentation are:

- Low production, productivity and profitability
- Keeping the land idle and not using it
- Selling the land for agricultural or non-agricultural purposes
- Moving to the cultivation of olives and other fruit trees in suitable or unsuitable areas
- Environmental degradation and soil erosion

c. Frequent frost and drought in addition to desertification and land degradation

The major causes are:

- Climate change
- Improper land use and agronomic practices
- Weak mitigation, prevention measures and coping strategies.

The potential direct and indirect effects and impacts are:

- Loss of production and productivity
- Damages in the structures and infra-structure of the farms, consequently losses in capital
- loss or reduction in number of livestock
- Overuse and misuse of natural resources

d. Overgrazing and unsustainable use of the rangelands

It is mostly resulted from the following:

- Drought and shortage of water
- Poor participation of local community in the decision making process
- Weak institutions, cooperatives and farmers' organizations
- Inappropriate and weak enforcement of laws and regulations
- Market distortions and subsidies

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The major effects and impacts are:

- Deterioration of biomass and land cover
- Soil erosion, land degradation and desertification
- Social conflicts and unrests
- Increasing import of feed stuff and meat
- e. Increasing pressure on the natural resources mainly water and agricultural lands

The major causes are:

- Absence of proper land use plans and laws
- High population growth rates
- Urbanization
- Weak and improper implementation of polices, strategies and regulations

Major effects and impacts are:

- Depletion and over pumping of ground water
- Abandoning of farming
- Decrease in production, productivity and quality of produce
- Increased number of the rural poor
- Social problems and unrest

6.2. Challenges/ issues related to the institutional and legal framework

a. Low efficiency of agricultural institutions

The major causes are:

- Weak capacities and capabilities of the human resources
- Improper allocation of financial resources mainly for developmental purposes
- Successive change in leadership and top management of institutions
- Improper legal framework
- Lack of motivation and incentives to staff
- Weak partnership mechanisms mainly with private sector and NGOs
- Weak participation and role of women, youth and vulnerable segments of the society
- Poor support to agricultural community organizations

The major effects and impacts are:

- Poor and improper services
- Increased production costs
- Weak application of standards, specification and quality control

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- weak quality assurance measures particularly in relation to food safety and hygiene(e.g. use of contaminated or untreated brackish water)
- Brain drain of qualified staff

b. Generally poor and/or inefficient agricultural services.

The major causes for poor delivery of *extension*, T.T, rural financing risk management, quality assurance and laboratory (diagnostic, food safety) services are:

- Low efficiency and performance of staff
- Limited financial resources available to the institutions
- Lack of transportation means equipment and tools
- Weak private sector involvement
- Weak farmers organizations and cooperative system

The direct and indirect effects and impacts are:

- Low productivity, quality of produce and farmers profitability
- Inefficient/ improper use of natural resources
- Spread of plant and animal diseases which might affect humans (e.g. zoonotic diseases)

c. <u>Weak cooperative system and limited private sector involvement in certain sub-sectors and activities.</u>

It is worth mentioning that out of 1350 registered agricultural cooperatives in JCC, only 800 are $active^{132}$

The major causes are:

- Relatively high risks and uncertainties in agriculture
- Weak control and regulatory framework
- Farmers attitude and culture
- Present legislation is not compatible with the needs of the cooperative sector
- Weak and unstable governance structure
- In adequate capability(administrative, technical and financial) of the JCC
- Small size of the cooperatives
- Poor organization and lack of equitable representation of the farmers' communities
- Poor /absence of cooperative and community organizational training and awareness
- Absence or unreliable data and poor use of the ICT capabilities

The direct and indirect effects and impacts are:

- Low productivity, resource use efficiency and profitability

¹³² Source: ACC General Manager and <u>www.jcc.gov.jo</u>. ACC's main role is to offer services and advise to cooperative members (farmers, etc.). Only 30- 35% of the registered cooperatives are agriculture oriented Draft Final Report – Volume 1 – Specific Contract N° 2011/278635 – version 1

- High vulnerability of farmers to changes and shocks
- Limited investment available to farmers

d. <u>Improper legal framework that govern agricultural sector, some of regulation either lacking, weak</u> <u>or weakly enforced</u>

The major causes are:

- Weak institutions and human capacities
- Weak knowledge and awareness among farmers and other stakeholders
- Social, cultural and traditional issues

The major direct and indirect effects and impacts are:

- Low efficiency and performance of agricultural practices
- Public, plant and animal health problems
- Low competitiveness in the markets especially in the foreign markets
- Misuse of the natural resources
- Social conflicts and troubles

e. <u>Despite the several policies, strategies and plans that have been formulated, the commitments of</u> <u>the government and donors support to the sector are minimal</u>

The major causes are:

- Weak awareness of the importance of agriculture
- Weak institutional (infrastructure and human resources) capacities
- Declining of contribution of agriculture in the national economy
- Reluctance of the private sector to invest in agriculture
- Weak farmers organizations and pressure groups
- High risks and uncertainties

The major direct and indirect effects and impacts are:

- Low efficiency and performance
- Mistrust and frustration of farmers and farming community

f. Inconsistent and weak data, agricultural statistics, information, GIS and MIS systems

The major causes are:

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- Uncoordinated and harmonized data collection system
- Poor or lack of plans for use of ICT advances
- Weak human and financial resources

The major direct and indirect effects and impacts are:

- Unreliable data and information
- Poor decision making and decision support system
- Loss of opportunities and financial resources
- Poor capacity for risk management and preparedness leading to high vulnerability to natural disasters

6.3. Challenges/ issues related to the socio-economic aspects

a. <u>More young people are not willing to work in agriculture, despite the availability of jobs at</u> <u>family and village level</u>

The major causes are:

- Social considerations and conceptions
- Relatively low returns and incentives
- Dominance of subsistence agriculture in the rainfed areas
- Availability of social security payments
- Remoteness of the agricultural and plastic house fields from the dwelling of the youth who lack the experience of overcoming hardships
- Presence of guest labour at competitive terms
- Lack of awareness, rehabilitations and training facilities
- Lack of health and pension insurance policies to wage farm workers
- Willingness of the youth to work in cities

The direct and indirect effects and impacts:

- Social problems and unrest (the youth are hidden time bombs)s
- Loss of major labour force
- Increasing dependency of guest workers
- Political consequences
- Food insecurity

b. High dependency on imported feed stuff

The major causes are:

- Limited natural resource base mainly water
- Low returns compared to other crops
- Low range carrying capacity and poor farm management
- Relatively high prices of local sheep meat
- Lack of investment on developing water saving and cost effective animal feed resources
- Lack of integration between cropping and animal farming

The direct and indirect effects and impacts are:

- Drain of national financial resources
- High vulnerability to the fluctuations in the international prices
- Poor NRM and appropriate use of marginal lands

c. Gradual neglect of the importance of agricultural sector

The major Causes are:

- Low awareness and realization of the importance and role of agriculture in the national economy, social and environmental impacts
- Weak agricultural support groups and lobbies
- The misconception that the scarce water resources are misused by the agriculture sector
- Dominance of the industrial and tourism sectors
- Availability of earning in foreign countries and opportunities for remittance to the left behind family members
- Bias of donors to other sectors

The direct and indirect effects and impacts are:

- Low efficiency and performance of the sector
- Abundance of farming
- Social and environmental effect

6.4. Challenges/ issues related to the production, productivity and profitability

a. Low productivity and profitability of agricultural activities and practices

The major Causes are:

- Poor agricultural services and infra-structure
- Inefficient and overuse of inputs and natural resources
- Generally small and fragmented holdings
- Weak institutions and legal frameworks
- Weak cooperatives and absence of empowered farmer's organizations.

The direct and indirect effects and impacts are:

- Leaving farming and shifting to other jobs or be jobless
- Depletion of the traditional capital (Getting rid of the land or livestock)
- Diversification of production
- Migration to urban or foreign job opportunities

b. <u>Limited competitiveness of Jordanian agricultural produce in the foreign markets, especially the</u> <u>export of quality and high value crops</u>

The main causes are:

- Lack of awareness of the stakeholders at most of the value chain of the innovative interventions caused by week extension and T.T systems
- Weak regulations and quality control
- Subsidy and cheap inputs in other countries
- Poor marketing services and infra-structures
- Unfavourable farm-gate pricing policies
- Weak index standing of the requirements in the importing countries caused by poor compliance with SPS and related mechanisms

The direct and indirect effects and consequences:

- Low returns to farmers and dealers
- Marketing more in the local Markets

c. <u>Widening gap between the consumers prices and farm gate prices, as it reached about 34% for</u> vegetables and 38% for fruits in 2010

The major causes are:

- High profit margins of the dealers, middle men, and the retailers
- Lack of marketing standards
- Absence of competition with imported products
- Poor quality including packing and packaging
- Weak cooperative marketing

The direct and indirect effects and impacts:

- Low returns to farmers
- Selling products in neighbouring local markets
- d. <u>Low productivity especially in case of rainfed farming, extensive livestock raising and</u> <u>rangelands</u>

The major causes are:

- Weak application of appropriate technologies
- Weak cooperatives and herders organisations
- Weak enforcements and appropriateness of legislations
- Overstocking and overgrazing

The direct and indirect effects and impacts:

- Degradation of land and desertification
- Decrease the bio mass and biodiversity
- Abandoning crop and livestock farming
- Migration and displacement

7. Conclusions and Recommendations

Following extensive review of documents, information and data, the EU-Mission Team held extensive discussions with all stakeholder categories involved in the Jordanian agriculture value chain (farmers, herders, cooperative leaders, public sector professionals, policy makers and provincial officials, researchers, private sector producers, retailers and exporters, as well as representatives of the regional international aid and technical assistant agencies). The Team travelled across the country and examined the problems and opportunities of the sector in the major AEZs.

Following analytical discussions of the strengths, weaknesses, opportunities and threats (SWOT) of the various subsectors (agronomic crops, vegetables and fruits, livestock, agro-food business and the whole agriculture sector) the mission validated the analysis at a very well attended stakeholders' workshop. The conclusions and recommendations for EU possible follow-up actions, at this stage of the study, are preliminary and should, once the feedback on Volume I is received, help the Team to undertake full synthesis and gap analysis during the last phase of this study that will commence in April. Both the other two volumes of the study (synthesis; gap analysis/follow-up recommendations) will be supported by two public consultations, one of them being dedicated to the high level decision makers.

7.1. Summary finding and recommendations:

Jordan is mostly arid (90%) and semi-arid (8%). The Jordanian agriculture is established along three major climatic regions: (i) Badia (mostly livestock systems and some cultivation in watershed and from deep bore irrigation: (ii) the highlands and Marginal steppe where most of the rainfed farming is practiced, and (iii) the lowlands (Jordan Valley) that thinly stretches from the North West (NW) to the South West (SW). Agriculture (animal and crop farming) are mostly influenced by water availability and the ability to adopt advanced water harvesting and to use technologies and interventions to mitigate the impact of the climate change.

<u>Agronomic crops:</u> The country produces wheat, barley and food legumes mostly under rainfed cultivation (200-500 mm rain). The produce is far below consumption and the country imports significant amounts of wheat and animal feed. The main issue is whether alternatives to wheat and barley could be considered e.g. fodder plantation for animal feeding in the rainfed areas, flood plains and watershed.

<u>Vegetables and Fruits</u>: are mainly produced in the Jordan river Valley (45% of national production and 40% of cultivated areas and use of about 215 mcm of surface and blended treated wastewater in the lowland areas, but also all over the country where water resources are available (e.g. - crops like tomato in the centre and the south; underground borehole irrigation in Dice in the SE, Mafreq in the NE), about 55% of national Production and 60% of cultivated areas. Agriculture in the highland consumes about 444 mcm of water, mainly groundwater. Land fragmentation, high land value and increasing number of absentee and commercial famers have caused a shift from the traditional family based open cultivation to the commercial production under large plastic house businesses manned by

foreign labour. Another impact of land fragmentation and high land value is the increase in Olive plantations even in unsuitable cracking clay areas in NW Jordan. On the positive side, commercialization of fragmented lands lead to diversification, use of modern technologies and varieties and the expansion of plastic covered vegetable export plantations. An issue influencing the competitiveness of the subsector is the open import markets where cheaper products from Syria and Egypt are fetched by the consumers.

<u>Olives:</u> One impact of land fragmentation and high land value is the increase in olive plantations even in unsuitable cracking clay areas in NW Jordan. On the positive side, commercialization of fragmented lands lead to diversification, use of modern technologies and varieties and the expansion of plastic covered vegetable export plantations the production of olives is highly variable, with a good crop every other year. Most of the olive trees are planted in the rainfed areas. Distributed over relatively small farms using traditional farming techniques and minimal use of chemicals. Irrigated olive plantations areas cover fewer areas compared to rainfed and has failed in most because of water scarcity or over exploitation of ground water (Dice and Azraq regions).

<u>Agro-Food Business</u>: Agro-industry is still in its infancy but gaining momentum. The position of Jordan and the abundance of foreign labour might advance this sector, but uncertainties and risks (in the amount produced, quality of the product, sustainability of the foreign labour, among many other reasons) need to be taken into consideration.

<u>High value products:</u> Some locations in Jordan are suited for honey production and for the expansion in medicinal herbs and aromatic plants (MHAP). These commodities possess high water use efficiency, and relatively high economic returns per unit area compared to conventional crops. In addition, MHAPs and Honey community organisations, along with dairy cooperatives and community broiler schemes could offer <u>important opportunities for women</u> who are increasingly abandoning agriculture with disappearing family farming and herding practices.

<u>Livestock systems:</u> Livestock production has become mostly a feed based (grown or purchased) commercial enterprise. The Smallholders who do not own a number of flocks above a certain threshold (50 head in the high rain areas and above 100 in the low rainfall) that allows them to profits from selling the offspring after securing enough cash to purchase feed for the breeding flocks , are driven out of their traditional herding business. Most of the viable livestock systems are commercial. Dairy, poultry and large flocks of sheep and goats are raised fully on commercial basis, depending mostly on imported animal feed and employing foreign labour, mostly from Syria and Egypt.

<u>The Rangelands:</u> Most of Jordan land surface are rangelands which are mostly in dismal situation having lost the vegetation cover because of overgrazing, recurring droughts, cultivation in the marginal areas and other human activities (roads, settlements. Restoration and reclamation requires holistic approaches such as the recently launched UNCC funded Badia Ecosystem Restoration Program (BRP). There highest national attention must be given to the BRP. This BRP Programme is expected to implement a holistic long-term community driven approach that incorporates the linkages between livestock, water, soil, grazing and supplementary feed resources, while considering

income-generating activities such as ecotourism, forest products , honey, high value medicinal and herbal plants. A major task of the program is to deal with the land tenure system in a fashion that does not contradict with the laws, but provide the Badia dwellers the incentive to manage and protect the rangeland resources. One major innovation sought by the BRP is the devolution of the full responsibility of managing and improving the fragile Badia resources to the local communities, a pursuit that must be supported by favourable policies and legislations.

<u>Dairy farming</u> in Jordan is commercial depending purchased feed mostly from imported source. The dairy farmers complain about high feed prices, but admit availability of free veterinary services for the major national diseases. Milk production cost is high due to the high feed prices. The industry fulfils most significant portion of the local consumption. The larger commercial plants monopolize the market and the only possibility for the smaller business(one to 10 dairy cows) is to work under the umbrella of well organised and commercially trained and managed dairy farmers organisations capable of insuring vertically integrated *food supply chain* (Figure 17 below). The dairy cows are generally from good breed, improved crosses of local or adapted imported breeds.



Figure 17: Models of vertically integrated commodity value chain and food supply chains

<u>Poultry production</u>, though decreased from 7.5million birds to 5.8 million birds between 2005 and 2008, remains a viable and productive industry which responds to the local market demands. The value of investment is high, and the commodity also enhances investment and creates jobs in related activities (e.g. the expansion of poultry production creates many feed processing units, conversion of poultry by-products into animal feed and organic fertilizers. Famers met informed that feed cost is their major problem. It seems that access to public animal health services is possible and well facilitated to most poultry farmers.

<u>Water budget:</u> Jordan is one of the top four water poorest countries in the world. There is need to develop technologies and innovations that maximize water use efficiency such as (i) crop diversification and cultivation of high value crops that fetch competitive local and international markets while replacing crops that use proportionately higher amounts of water; (ii) develop food and feed crop varieties that are tolerant and adaptive to climate change; and (iii) enhance the integration and complementarity between crop and livestock production systems.

<u>Competitiveness</u>: Generally the Jordanian agriculture lacks favourable political, policy, strategic, legal and financial environments that attracts the investors and provides the farmers with sustainable inputs and services. Therefore, it is highly important to assure effective implementation of the existing polices and strategies and to devise, where needed, further tools and legislations that assure sustainable and equitable use of the agricultural resources.

<u>Socio-economic:</u> Agriculture in Jordan is closely linked to several socio-economic issues especially in rural areas. The following are the major issues and recommendation: (i) Agriculture should not be considered as a mere economic activity, rather as major contributor to the livelihood of rural poor, small farmers and marginalized segments of the society. Therefore more attention and investment should be geared to the sector ;(ii) unlike their parents and grandparents, the rural youth are not motivated to work in agriculture because of social and economic factors in addition to low salaries compared with other sectors in the economy. Such attitude could be reversed if agriculture labour could gain similar attraction as other jobs that provide allowances for housing, transport, insurance and pension; (iii) Small and fragmented holdings and common titles to land negatively affect the efficiency and profitability of the different agricultural practices. Farmers Organisations (FOS), associations and cooperatives have proven to be effective tools to minimize the negative effects of such issues. The proper environment and incentives need to be in place to overcome and remedy the situation; (iv) Agriculture is not a sector that stands alone, it has its own forward and backward linkages, and requires proper enabling environment to flourish.

Supportive infra-structure and services such as schools, health, rural roads and rural development activities must be made available in order to motivate the farming communities to adopt profitable and sustainable agricultural practices.

<u>The Agricultural Production subsectors:</u> Promotion and dissemination of appropriate knowledge and technologies mainly those related to water management, farm and herd management, marketing and processing is important for all sub-sectors (agronomic crops, vegetables and fruits, livestock systems; and agro-food businesses). This could be achieved through: (i)provision of appropriate agricultural services, infrastructure and enabling environment such as finance, labs, quarantines, quality assurance, roads, transportation, storage, vet services, extension and research; (ii) cost reduction and return maximization to farmers through the promotion of farmer's cooperatives, reduction of post-harvest losses, diversification of production, reducing marketing margins and enhancing farmers capabilities; (iii)Improved rangeland productivity and restoration of the Badia eco-system;(iv) improved competitiveness of the agricultural products in the local and foreign markets by producing quality certified products at right prices benefiting from Jordanian comparative and competitive advantages

Land use planning: There is a need to enforce land use planning policies and review the laws and bylaws that resulted in land fragmentation. Also, there is a need for programmes that tackle issues of the adoption of breeding and flock improvement techniques to regulate stocking rates and stop the expansion of crop cultivation (usually low yield field crops) at the expense of the fragile rangeland ecosystem. It is also rather important to assess the threats caused by urbanization and the encroachment of human settlements in the arable areas; poor support to green belts around the cities.

7.2. Gap identification and preliminary analysis

A. <u>Inadequate knowledge of the causes of poor coordination and harmony between the sector's public</u> <u>institutions:</u> The public sector institutions remain very important contributors to providing services and framing strategies and polices of the sector. However, these institutions are mostly oversized and are highly complex thus afflicting budgetary burden on the economy. The Mission noted the hostility and lack of cooperation and overlap among these institutions. Any reform will not be possible unless collective actions that reflect sincere determination for correction and streamlining are devised.

Recommendation: An agricultural sector institutional reform driven study acceptable and significantly supported by the highest ranking authorities is needed. The study should look at the strengths and weaknesses of these intuitions, and develop reform options.

B. <u>The small farmers form the majority of the agriculture families</u>, but they are being driven out of their cultural and traditional livelihoods domains without other income generating alternatives. The holdings or the flocks owned by the small farmer are too small to withstand shocks. Farmers' Organisations (FOs) could offer the farmers (as shareholders) the collateral and the power to borrow and repay loans. Also the cooperative system is not functioning properly being constraint by poor coordination, mandates, competition with the private sector and poor governance.

Recommendations: To conduct a detailed socio-economic and biological study with the aim of identifying options to strengthen the Farmers' Organisations (FOs) in forms that assure equity, empowerment and voice to the smallholders and poor herders. Options to ensure full representation of the smallholders as shareholders in all relevant FOs business ventures will be studied benefiting from successful experiences in other countries and communities.

C. <u>The youth in Jordanian agriculture</u>: The Jordanian youth are averting from agriculture! The youth prefer to stay without jobs for several years rather than being exposed to the grudge of living away from their families in the commercial agricultural farms. Although the Jordanian women enjoy constitutional rights to work and to be involved in the public life, they are driven out of the agriculture labour market because of the decline in household farming and herding. The Mission was given a number of explanations for this situation. However, as the unemployed youth increase in number, finding solutions becomes more difficult, leading to the volatility of the geopolitical environment of Jordan and its surrounding countries. This is a matter of great concern that impacts on the social strength as well as the food security of the Nation, and must be given high attention;

Recommendation: A study to investigate causes of poor participation of the young men and women in the agricultural sector is urgently needed. Similar to above the study must be highly supported and facilitated. Although social in nature, the study must look at all aspects of the problem

D. <u>Foreign labour: Migrant labour from the neighbouring countries specially Egypt and Syria are</u> currently of high demand to the commercial and emerging agricultural systems

 Recommendation: The A study of the impact of foreign labour on the sustainability of the agricultural sector

E. <u>Crop diversification</u> In order to maximize farmers profitability and to benefit from Jordan's diverse climatic zones, there is need to establish practical approaches to improve the efficient use of the natural, human and financial resources. For example, there is need to explore possibilities of shifting the cropping systems from the high water consuming crops to (i) high value export crops such as, herbal and medicinal plants, date palm, cut flowers, cherry tomatoes, colored pepper, strawberries among others; (ii) fodder plantation for animal feeding in the rain-fed areas, flood plains and watershed; (iii) bee keeping and other forest products, among others. In order to achieve such goals, there is need for favourable environment (finance, extension, postharvest facilities and treatment, marketing, information and quality assurance services).

Recommendations: to conduct a comprehensive sector value chain analysis with the purpose of (a)identifying the competitiveness of Jordanian agriculture nationally, regionally and internationally; (b) exploring means of improving the potentials of certain commodities and production systems.

F. <u>Extension and research organizational structure and linkages</u> The recent amalgamation of the public research and extension services has contradictory and mixed judgment from different stakeholders being farmers, extension workers or researchers and their institutions including the agricultural directorates in the governorates.

Recommendations: Conduct a study to (i) evaluate and assess the impact of the merger on the extension and research services delivered to farmers in terms of efficiency, effectiveness and sustainability and to recommend appropriate remedial interventions and measures; (ii) assess options to reinvigorate and expand the benefits from NCARE and to modernize its approaches for R&D service delivery and innovation mainstreaming

G. <u>Land fragmentation and common title</u> Due to the inheritance laws and increasing prices of agricultural lands, the holding size is continuously decreasing which negatively affect the production and productivity of agricultural sector.

Recommendations: Review the extent and consequences of land fragmentation on agricultural and suggest policies, regulations and institutional interventions such as cooperative, shareholding companies and agricultural land consolidation fund.

H. <u>Review of the agricultural policies, strategies and laws</u>. There are many legislative reform strategies designed to improve the performance of the agricultural sector. However, most of these are not effective or have not yet led to the expected impact. Among many reasons is the lack of qualified field and HQ staff in the concerned public sector institutions who could be engaged in the development, formulation, analyses and implementation of policies, strategies and plans. **Becommendation**: To undertake a comprehensive evaluation of the policies. strategies and laws that

Recommendation: To undertake a comprehensive evaluation of the policies, strategies and laws that impact on the agricultural sector in collaboration with other partners (e.g. NDAF, USAID) ;to design and support a project aiming to enhance and upgrade the capacities and capabilities of relevant staff and institutions to perform the tasks properly

I. <u>Farm Management Survey</u>: The farm management survey provides accurate data on costs and revenue of farming in the area of plant and animal production. Also it helps in the study of the relationships between inputs and outputs of the different agricultural production systems. Such living enterprise budget for different crops grown in different agro-climatological zones and updated annually is an important decision making tool. However, the Mission noted that a survey was carried out by the Department of Statistics (DOS) only once in 1988.

Recommendation: To undertake a farm management survey in order to provide comprehensive and up to date information on all of the agricultural operations that are within the possession. The data, once Draft Final Report – Volume 1 – Specific Contract N° 2011/278635 – version 1

collected and analysed would be important for making economic decisions and policies concerning the development of the agricultural sector. The results, if based on surveys modelled to generate socioeconomic and farming community livelihoods based data, will also help the farmers to make sound economic decisions

J. <u>Cooperatives and farmers organizations</u>: The majority of farmers in Jordan are classified either small or middle size farmers, which directly affects and impact their efficiency, profitability and sustainability. Farmer organizations and cooperatives constitute a major solution to solve this problem, yet the experiences in Jordan are far from being successful, as most of the agricultural cooperatives and farmer organizations are not properly functioning

Recommendation: Conduct an evaluation and assessment of the agricultural farmer organizations and cooperatives in Jordan, analysing their performance, major problems and constrains, SWOT analysis, lessons learned and to recommend future actions and interventions in order to activate and operationalize farmer groups and agricultural cooperatives as a major tool to achieve the strategic objectives of agricultural sector.

- K. <u>Price policy survey</u> and detailed <u>value chain analysis</u> for main horticultural crops Studies aiming to support the <u>creation of agricultural Investment windows</u>. The results would useful in providing the rationale for engaging the local communities in leasing their land in return for contractual and economic benefits
- L. <u>Olive studies</u>: Demand of high quality olive oil and processed oil is increasing worldwide. In response, the past decade witnessed an increase in olive plantations and product, sometimes in unsuitable soils and production systems. Also this expansion was not supported by measures to enhance the competitiveness of the Jordanian olive oil in the regional and international markets.

Recommendation*:* to study the potentials and prospects for developing a sustainable and competitive olive production and processing industry