

*Feasibility Study on Water Resources Development in
Rural Area in
the Kingdom of Morocco
Final Report*

*Volume III Supporting Report (1)
Basic Study*

***Supporting Report V Soils, Agriculture
and
Irrigation***

**FEASIBILITY STUDY
ON
WATER RESOURCES DEVELOPMENT
IN
RURAL AREA
IN
THE KINGDOM OF MOROCCO**

FINAL REPORT

**VOLUME III
SUPPORTING REPORT (1)
BASIC STUDY**

**SUPPORTING REPORT V
SOILS, AGRICULTURE AND IRRIGATION**

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SUPPORTING REPORT V
SOILS, AGRICULTURE AND IRRIGATION

V1 Soils

V1.1 Classification of Soils

Soil classification in Morocco has applied French Soil Classification (C,P,C,S, 1967). The basic concept of this classification is based on the soil morphological conditions concerning with the climatic conditions, topographic features and parent materials, etc. Moroccan soil classification composed of twelve Classes.

Soil Classes in Moroccan Soil Classification

1) Sol Mineraux Bruts	5) Sol Calcimagnesiques	9) Sol a Sesquioxides de
2) Sol peu Evolues	6) Sol Isohumiques	10) Sol Ferrallitiques
3) Sol Vertisols	7) Sol Brunifiers	11) Sol Hydromorphes
4) Sol Andosols	8) Sol Podozolises	12) Sol Sodiques

The high-level units comprise the Classes, Subclasses, Group and Subgroup; the low-level units comprise the Families, Series, Type and Phases.

The typical soil features of each soil Classes are shown in Table V1.1.1.

V1.2 Land Suitability Classification of Soils

The classification of land Suitability in Morocco has been applied the GEOFFROY system (1978). Three major classification principals were applied as follows.

- Constraints of the topography: slope, hydraulic erosion, micro-relief
- Constraints of soils: depth, texture, stony, salinity, alkalinity
- Constraints of water: flood, drainage

Basic methodologies of the land suitability survey consisted from following items.

Major Observation Items for the Land Suitability

No	Survey Item	Sampling condition
(1)	Photo Interpretation	Whole survey area
(2)	Observation of soil profile	Depend on the scales of mapping
(3)	Topography Interpretation	Slope, Hydric erosion, Micro-relief
(4)	Soil Feature	Soil depth, Texture, Stony, Salinity, Alkalinity
(5)	Drainage Feature	Flood, Draining

Classes of the land suitability are composed of 5 Classes. General conditions of land suitability class are summarized as follows:

Class I: Suitable soils for all kinds of cultivation. There is no constraint for irrigated cultivation.

Class II: Suitable soils for cultivations. Only minor constrain(s) are observed. The areas of these soils can be developed with proper construction managements.

Class III: Suitable soils for cultivation. But they have certain constraints to be well considered for cultivation. These constraints can be soluble with supplemental construction management.

Class IV: Soils included serious constraints for irrigation purposes.

Class V: Soils to be dismissed from irrigation

Class VI: Soils not suitable for any agricultural purpose

In the land suitability maps, following items should be symbolized and/or mentioned.

Mapping Criteria and their Symbols

No	Analysis criteria	Symbol	Class	No	Analysis criteria	Symbol	Class
(1)	Slope	Pe	6	(7)	Hydraulic erosion	Eh	5
(2)	Flood condition	I	5	(8)	Micro topography	M	5
(3)	Drainage	D	5	(9)	Soil depth	P	5
(4)	Permeability	K	5	(10)	Stony	C	5
(5)	Salinity	R	5	(11)	Alkalinity	A	5
(6)	Texture	T	9	(12)	Lime stone	Ca	4

Symbolizing of these classed on the map put in the maximum serious constraints.

Standard criteria and there descriptions are shown in Table V1.1.2.

V1.3 Soils in Morocco

Major soils in Morocco are Sols Peu Evolues, Vertisols, Sols Calcimagnesiques and Sols Isohumiques.

Sols Peu Evolues D'Erosion (Entisols), which have A and C layers widely lie on the internal mountain areas. These soils are not well developed with less weathering and show the characteristics of parent rocks.

They have relatively shallow soil layer and are easily eroded. Sols Peu Evolues D'Apport (Entisols, Aridisols) which have alluvial deposits lie on the area along the rivers, show similar characteristics with Sols Peu Evolues D'Erosion and are rather weathered.

Vertisols lie on the northern areas of Fes and southern areas of Casablanca and El Jadida. These soils have A[B]C profile, which have high water holding capacity. The soils have high clay contents (35 – 40%) and high cation exchange capacity ranging from 35 to 40 me/100g.

Sols Calcimagnesiques (Inceptisols and Mollisols) widely lie on the areas covering the northeast areas in Nador and Taza. These soils are developed on the parent rock and have the AR or AC profile, in which B-horizon does not occur.

Surface soil has light texture and accumulation of organic matters, which are linked with minerals. The soils are saturated more than 90% with calcium and magnesium.

Sols Sesquioxides de Fer (Alfisols) mainly lie on the coastal areas from northern Tanger to El Jadida, and have ABC or A[B]C horizons. These soils are gray or brown in color due to minerals and high base saturation (more than 50%) and low organic matter contents.

Sols Isohumiques lie on the areas of Fes, Beni Mellal, Marrakech and Taroudant. These soils are developed on the limestone or enriched limestone by the alternation of constitutive minerals. The soil profile shows A[B]C or ABC which contains more than 15% of organic matters in A horizon.

Exchangeable bases are mostly saturated by calcium and magnesium, but there are some soils which contain exchangeable sodium.

Sols Brunifiques lie on the areas located between Khemisset and Kenitra. These soils have developed horizons with A[B]C or ABC and are characterized by humus with strong biological activities. The characteristics of the parent rock are not so prominent, though they are of high humus and clay complex.

Sols Hydromophes lie on the areas of Benslimane and south of Casablanca. These soils have developed under the condition of strong effect of hydromorphic phenomenon. They have accumulation of organic matter with anaerobic condition. Sols Sodiques can be found only near Tanger which have high salt contents in the soil layer. The soils located near the border of Algeria and Mauritania, and the areas of south Sahara have not been surveyed well. It seems that the soils developed on these areas show similar characteristics of Sols Mineraux Bruts, which are only physically weathered with less precipitation and high temperature.

The areas of each soil classified on Soil Map in Morocco on a scale 1/2,000,000 are as follows. The map on the soil classification in Morocco is attached as Figure V1.1.1 and their classification are listed in the following table:

Soil in Morocco

French Classification	Soil Taxonomy	Area (km ²)
Sols Mineraux Bruts	Entisols	17,658
Sols Peu Evolues D'Erosion	Entisols	40,966
Sols Peu Evolues D'Apport	Entisols, Aridisols	20,395
Vertisols	Vertisols	17,799
Sols Calcimagnesiques	Inceptisols, Mollisols	45,451
Sols Isohumiques	Inceptisols, Mollosols	22,778
Sols Brunifies	Inceptisols, Alfisols	3,536
Sols Sesquioxides de Fer	Alfisols	7,584
Sols Hydromophes	Alfisols, Inceptisols	2,790
Sols Sodiques	Aridisols, Inceptisols, Entisols	112
Sols Peu Evolues D'Erosion associate with Sols Mineraux Bruts		247,030
Not surveyed, but expected as dominant soil of Sols Mineraux Bruts		409,516
Total Area on Soil Map		835,615

Source: Soil Map in Morocco, Direction de la Conservation Fonciere du Cadastre de la Cartographie

V2 Agriculture

V2.1 Agriculture in Morocco

V2.1.1 Land Use

According to the results of the agricultural survey in 1996/97 carried out by the “Direction de la Programmation et des Affaires Economiques”, the total area of farmland in Morocco is approximately 8.7 million ha including fallow land in 1996/97 (Figure V2.1.1). And the forest areas including natural forest and afforested area are covering approximately 3.7 million ha and 0.5 million ha, respectively. In these five years, the total farmland has not been changed, though the cropped area has changed year by year depending on agro-climate condition.

The cultivated area of cereal crops occupied 67% of the total farmland (Figure V2.1.1). The area for cereal cultivation including wheat (hard and soft), barley and maize is 6.3 million ha. Barley is major cereals and followed by soft wheat, hard wheat and maize.

Fruits cultivation occupies the second largest area, which covers 9% of the total farmland or approximately 0.82 million ha. In fruits land, olive is cultivated throughout the country, whereas other fruits such as almond, grapes and dates are cultivated depending on the agro-climate conditions as well as geographical variations. There are no detailed data of on crop-wised cultivated area on the statistical data mentioned above. But according to the data in 1997/98, olive crop occupies about 57% of fruits land, followed by almond (14%), citrus (8%), grapes (7%) and dates (4%).

Olive trees cultivated in the flat areas are dense and those cultivated in mountainous areas are by scattered. Almond trees are basically cultivated in the mountainous and hilly areas where soil and topographical conditions are relatively poor. Legumes, vegetables and fodder cultivation are the third largest in land use. Cultivated areas for legumes, vegetable and fodder are approximately 255,000ha, 241,000ha and 220,000ha respectively.

Vegetables are mainly cultivated in northern coastal areas facing the Atlantic Ocean, Agadir and Marrakech areas where large cities are located, and Oujda areas in northern part of Morocco. Major cultivated crops are as follows:

Major crop cultivation

Class	Major crops
Cereals	Barley, Wheat (hard & soft), Maize
Fruits	Olive, Almond, Citrus, Grapes, Apple, Dates
Legumes	Broad bean, Green peas, Chickpea, Lentil
Vegetable	Potato, Onion, Tomato, Sweet melon, Green peas

Source: Collected Data from Ministry of Agriculture, Rural Development and Fisheries

Approximately 13% of farmlands are left as fallow land.

Forests cover approximately 4.2 million ha in Morocco in 1996/97, and out of which, 0.50 million ha has been afforested. The forest areas of resinous essence and natural leaf are respectively 1.03 million ha and 2.67 million ha. Major trees in Morocco are cedar, thuja, pine and juniper in conifers and grebe oak, cork oak and argan in hard woods (Table V2.1.1).

V2.1.2 Agricultural Production

(1) Crop Production

Cereals are major production in Morocco. As mentioned in the proceeding paragraphs, about 67% of farmland has been occupied by cereal cultivation in 1996/97. However, the production has been strongly affected by weather condition. The production of cereals in these 11 years has changed between 1,75 million tons (1994/95) and 9,98 million tons (1995/96) and the yield of cereals has also changed between 0.4 and 1.6 ton/ha (Figure V2.1.2). Total production of cereals was 5,09 million tons in 1998/99.

Out of this production, wheat (hard), wheat (soft), barley and maize occupied 21%, 32%, 40% and 7%, respectively. The trend of production and yield of each cereal crops from 1988/90 to 1998/99 shows the similar situations (Figure V2.1.3). The Cultivated area, production and yield of wheat (hard), wheat (soft) and barley by Zones showed in Tables V2.1.2 to V2.1.4 respectively.

Main legume crops are broad bean, lentil, chickpea and green peas. Total cultivated areas and productions of these crops in 1997/98 are 382,000 ha and 245 ton respectively. The Cultivated area, production and yield of broad bean, lentil and chickpea by Zones are shown in Tables V2.1.5 to V2.1.7.

The productions of vegetables are increasing in these 6 years (Figure V2.1.4) Main vegetable crops are potato, tomato, onion, sweet melon and watermelon. The productions of these vegetables on open field in 1998/99 are 945,000 tons, 301,000 tons, 523,000 tons, 419,000 tons and 230,000 tons, respectively. The Cultivated area, production and yield of major vegetable crops are shown in Table V2.1.8.

Recently, vegetable cultivation in greenhouse has been operated and its total cultivated area and production were 7,800 ha and 652,000 tons in 1998/99, respectively (Table V2.1.9). Major vegetables produced in green houses are tomato, pepper, sweet melon, cucumber and green beans. Major production areas are Massa, El Jadida, Lopukkor and Gharb.

Major fruits are olive and citrus, which produce 550,000 tons and 1,194,000 tons in 1997/98, respectively. The cultivated area of fruits was increased, while the yields are changing year by year, which may be caused by the change of climate and affect of diseases (Table V2.1.10). Olives are cultivated in the whole country. Other major production areas of main fruits are as follows:

Major Production Area of Fruits

Fruits crops	Major Production Area (Province)
Almond	Azilal, Chichaoua, Taza, Ouarzazate, Marrakech
Dates	Ouarzazate, Er Rachidia, Tata, Figuig
Grapes	Meknes, Benslimane, Marrakech
Apple	El Hajab, Sefrou, Al Hauz, Beni Mellal, Meknes

(2) Livestock

Livestock is also important agricultural activity in Morocco. Breeding of cattle, sheep and goat has been widely carried out and these numbers are approximately 2.56, 16.58 and 5.11 million heads in 1999 respectively (Table V2.1.11). Camel breeding has mainly carried out in the dry land areas including Ouarzazate, Essaouira, Er Rachidia and south Sahara, and total number of camel is approximately 149,000 heads in 1997. Horse, mull and donkey have been utilized for cultivation and transportation, and these total numbers is 1.68 million heads in 1997. The feeding of goat and sheep by nomads has been still carried out and theses breeding are most important income for them.

The productions of meats in Morocco show in Figure V2.1.5. In the meat productions of these 3 years have been increased, which may occur by serious droughts. According to the field survey, the amounts of fodders are not enough to breed their livestock in these years because of the droughts; hence the farmers have to release their animals. Total meat productions of cows, sheep and goat area 131,255, 53,154 and 11,020 tons in 1999 respectively (Table V2.1.12).

The monthly average price of livestock per heads in 4 provinces shows in Figure V2.1.6. The prices of cows are stable, while sheep prices are decreasing in 2000.

(3) Processing of Agricultural Products

Major industries of agricultural processing in Morocco are sugar, oil, milling of wheat and milk processing. Sugar was produced by the processings of sugar beat and sugarcane, and the total production of sugar in 1997 was 2.4 million tons (Table V2.1.13). Oil is produced in 15 factories and the total production capacity was 330,000 tons/year in 1994 (Tables V2.1.14) The production of olive oil in 1997 was 50,000 tons and out of this production 33,700 tons were exported (Table V2.1.15). Production of milk in 1994 was 8.8.million liters and the production of milk processing including batter, cheese and milk power was 15,700 tons (Table V2.1.16). The flour is produced in 88 factories and their milling capacity is 400,250 tons/year (Table V2.1.17).

In farmer's level, the farmers are also producing processing products for self-consumption and private business. The major processing products are pickles of olive, dry grapes, dry apricot, husking of almond and milk processing such as batter and cheese etc.

V2.1.3 Agricultural Economy

(1) Import and Export of Agricultural Production

The import and export of agricultural products show in Figure V2.1.7 and Table V2.1.18. Morocco has imported large amount of wheat. The imported amount of wheat was 1,191,000 tons in 1994 and increased to 2,581,000 tons in 1998, which were equivalent to 3,728 million DH. This value shows almost half of the total import value of agricultural products. Sugar, seeding potatoes and milk products were followed and these values were 1,470 million, 137 million and 644 million DH. Total import value of agricultural products occupies 14% of the total value of imports.

Amount of imported wheat is large as 35% of total domestic consumption. Important agricultural commodities including staple foods such as wheat and livestock product (milk) also depend on the imports nonetheless these production has been main agricultural production in Morocco.

Major exports of agricultural product from Morocco are citrus, fresh tomato and shellfish. Fruits and vegetables are mainly exported to Europe, and fisheries products are exported to Japan. Total export value of agricultural products covers 3.2 % of total value of exports.

(2) Land Ownership

The average size of land hold per farmer is 5.78 ha in Morocco. Small farmers who consist of 55% of total farmers with less than 3 ha occupied only 12% of total farmland.

While, the large scale land hold farmers who have more than 20 ha occupied 32% of total farmland against 4% of total number of farmers. Tenant farmers also exist and their number is 64,400.

The systems of land ownership in Morocco classifies into 5 categories, which are Private farm (Melk), Grouping farm (Collectif), Habous, Guish and Public farm (Domain de L'Etat). The occupancies of these land ownerships are private farm (75%) grouping farm (18%), Habous (1%), Guish (3%) and public farm (3%).

(3) Farm Mechanization

Numbers of tractor, harvester and pump to operate agriculture in Morocco are 43,226, 3,764 and 154,223, respectively. The cultivated land near urban area such as Rabat, Fes, Casablanca and Marrakech has well introduced tractors for cultivation. The pumps for irrigation are utilized in Er Rachidia, Ouarzazate near the dry zones and also near the urban areas such as Rabat, Casablanca.

These agricultural machinery such as tractor and harvester has been introduced by relatively large-scale farmers, while small scale farmers has not much got the benefits of mechanization. Small farmers are rented these machineries from large-scale farmers.

It seems that the land preparation and harvesting by small-scale farmers are mainly carried out by animals and/or manpower or renting. On the other hand, the pumps for irrigation has been introduced even by small farmers, but their capacity seems to be rather smaller than that utilized by large-scale farmers (Figure V2.1.8).

(4) Farm Economy

i. Farming Input

Ministry of Agriculture, Rural Development and Fisheries have so-called “Standard” which estimates the general condition without and with project at traditional and modern cultivation. The estimated inputs at present traditional cultivation mentioned in “Standard” is shown in Table V2.1.19. According to this “Standard”, the fertilizer and agricultural chemicals are almost not applied in the cultivation of cereal and legume. In vegetable cultivation, manure and chemical fertilizers (N, P, K) are applied at the amount of 10 to 20 tons/ha, 37kg/ha as N, 28kg/ha as P_2O_5 , 14kg/ha as K_2O , respectively. Major fertilizers for cultivation of crops are 14-28-14 and TSP as base dressing, and urea, NH_4NO_3 and $(NH_4)_2SO_4$ as additional dressing. Unit prices of labor cost, operating cost of machineries and fertilizer in the ORMVAs shows in Tables V2.1.20, V2.1.20 and V2.1.22 respectively.

ii. Non-Agricultural Businesses of Farmers

Many farmers are getting a certain incomes to help their living expenses beside agricultural income. About 79% of total farmers are only engaging in agricultural activity and depending on their income. Besides, 21% of farmers are working and getting income other than agricultural activity. Major jobs are services, governmental administration, private business and construction. However, the actual value of income has not identified (Figure V2.1.9).

V2.2 Agricultural Condition in 25 Candidate Project Areas

The general conditions of land use, crop and animal productions and farming economy of commune rural in the 25 candidate project areas are shown in Tables V2.2.1 to V2.2.8.

The average farm sizes in Zones IV and V where are located in the southern morocco and desert area are smaller than Zones I, II and III where are located in northern morocco. In Zones III, IV and V, irrigated farming are commonly practiced. On the other hand, the cultivations in northern morocco have been carried out depending upon the rainfall (Table V2.2.1).

Most of farmers have carried out the agricultural activities on their own lands. The rate of tenant farmers and salaried farmers in Zones I and II are relatively high (Table V2.2.2).

In the land ownership, most of farmlands are under private land except Amez Miz, Boulauane and Taskourt in Zone III (Table V2.2.3). In these areas, the farms belonging to the grouping farm and “Guich” are located.

Tractors for soil preparation and pumps for irrigation have diffused in farmers. On the other hands, numbers of harvesters are very low (Table V2.2.4). Large-scale farmers mainly possess these machineries and small farmers have rented these machines.

Main crops in the candidate project areas are cereals (Table V2.2.5). The cultivations of legumes are carried out in northern morocco (Zones I and II). The cultivations of fodders (barleys in Zones I and II, alfalfas in Zones III, IV and V) and fruits are commonly operated.

Main livestock is cattle, sheep and goats in the candidate project areas. Goats are commonly breeding in Zones III, IV and V. Camels are breeding in only Zone V (Table V2.2.6).

Main non-agricultural businesses of farmers are service, public officers (Table V2.2.7). The farmers in N'Fifikh (Downstream), Timkit and Tadighoust areas are engaging in non-agricultural businesses. Businesses in construction works, services and public officer are main activities in Timkit and Tadighoust, and services and public officer in N'Fifikh (Downstream).

The educated levels of farmers are relatively low. More than 60% of farmers are illiteracy in all project areas. And more than 90% of farmers are under the education of secondary school. In Zones II and V, the rates of the farmers who got higher education are relatively high comparing to other zones (Table V2.2.8).

V3 Agricultural Extension and Supporting Services

V3.1 Institutional Arrangements for Extension Services

The Directorate of Development, Education and Research under the ministry of Agriculture, Rural Development and Fisheries has overall responsibility for extension related activities. There are four Divisions under the said Directorate, Division of Extension, Division of Professional Education, Division of Research and Higher Education and Division of Employment Education. At the Regional level there are 9 Regional Offices for Agricultural Development (ORMVA) and at the Provincial level there are 40 Provincial Directorates of Agriculture (DPA) that are responsible for agricultural extension activities.

The organizational structures of Ministry of Agriculture, Rural Development and Fisheries and Regional Office for Agricultural Development (ORMVA), and Provincial Directorate of Agriculture (DPA) are presented in Figure V 3.1.1, V3.1.2 and V3.1.3 respectively.

The main responsibilities of ORMVA are to develop irrigation infrastructures, promote and improve livestock and crop practices. It formulates, monitors and coordinates hydro-agricultural development activities, agricultural developments, water related administration etc. The extension activities for modern irrigated areas are the responsibility of ORMVA and it is represented by 180 Agriculture Development Centers (CDA) and Extension Centers (CMV) in local level. CDAs/CMVs carry out extension services in modern irrigated areas.

Extension activities for non-irrigated or rain-fed areas are the responsibility of DPAs. At the Cercle or Commune level there are 122 Work Centers and sub-centers staffed by technicians, who provide all agricultural and livestock extension services. A Director heads each Work Center and there is a multidisciplinary team to carry out the extension services. There are altogether 4,200 extension workers of which 2,300 in Work Centers and 1,900 under ORMVA. According to the local needs, several approaches are used for extension purposes i.e., close contact extension program, large scale and mass extension program, mobile team extension program, individual extension program for specialized farmers, observation tours, agricultural education to the young people and students etc. Education of farmers aims mainly at utilization of inputs and machinery, loans, irrigation, cooperatives/farmers' associations, etc.

V3.2 Development of Agricultural Extension Services

Soon after the independence from France in 1956, the Moroccan Government started national Agricultural Extension Services. Those services included not only technological advices but also supply of inputs, credits, marketing information, farmers' association etc. In recent years, between 1990 and 1998 Extension-Research Project (Vulgarization Research Project: PRV) and Agricultural Development Support Project (PSDA) were implemented. PRV introduced Training and Visit (T&V) method. PRV was implemented in 56 work centers (CTs) i.e., half of the 122 Work Centers. Those Works Centers were distributed into three groups i.e., Pilot Work Centers (17), Test Area (25) and Work Centers of Integrated Project Areas (14). The World Bank financed PRV. PRV reinforced the relationship between the services of extension, research, training and the farmers for a better transfer of technology. It introduced "Training and Visit (TV)" method. The chronology of extension related reforms and development are shown in Table V3.2.1.

PSDA encouraged the farmers to develop professional organizations. During the same period, eight Regional Centers for Agricultural Development (CREPA) were established at Benslimane, Amez Miz, Oued Amlil, Tanant, Chefchaouen, Khenifra, Khemisset and Tlet El Hanchane to train the young farmers. During eight years (1990-1998), 4,000 persons were trained.

To counsel rural women on agricultural matters female extension workers' teams were established.

V3.3 Agricultural Extension in Agricultural/Rural Development Programs

Several Integrated Agricultural /Rural Development Projects were implemented in Morocco from the late of 1970's (refer to Table V3.3.1). The trend of the development of Extension Services was intensified by the implementation of Integrated Agriculture/Rural Development Projects. Under the Projects, priority was accorded to the agricultural development, livestock development, irrigation, extension services, employment generation, education etc. Recent Integrated Rural/Agriculture Development Projects, such as "Integration of Population Education in Agricultural Extension Program (1993-96)", "Tafilalet and Dades Valley Rural Development Program (1993-99)", "Agricultural Development Back-up Project (PSDA, 1994-98)" and "Occidental Rief Mountain Area Development Project (1995-2001) has intensified extension services.

V3.4 Agricultural Research

There are several well-established research institutions in Morocco. The Directorate of Education, Research and Development under the Ministry of Agriculture, Rural Development and Fisheries is in charge of guidance, coordination, follow-up and evaluation of research programs and activities. The National System of Agricultural Research (SNRA) comprises, the National Institute of Agronomic Research (INRA), the National Center of Forestry Research (CNRF), and the Department of Experiment, Tests and Standardization (SEEN). INRA has produced significant results on genetic improvement of cereals as well as fruit trees. Specialized consulting laboratories are opened for farmers in the various regional centers of the INRA. Various commodity specific, subject specific and area specific research programs have led the development of some improved technologies in major cereal crops, fruits etc. as mentioned above. For the purpose of technology transfer, the Regional Research Centers of INRA work in collaboration with extension workers.

There are three higher educational institutions, the Hassan II Agronomic and Veterinary Institute (IAV Hassan II), the Meknes National School of Agriculture (ENAM) and the National Forestry School of Engineering (ENFI) and there are 14 Agricultural Technical Institutes (ITA), 9 Agricultural High Schools, 18 Centers of Agricultural Qualification (CQA) and 3 Centers of Training, Research and Development (CFRD). There are several government companies for the purpose of technology transfer, skill development, management of new agricultural land, collection and storage of cotton and quality control of exportable agricultural products etc.

Agricultural Development Company (SODEA) with a farm area of 63,000 ha, contributes for technology transfer, skill development etc. Agricultural Land Management Company (SOGETA) develops new agricultural land and manages it. Moroccan Company of Agricultural Products' Trading (COMPARA) collects and stores cotton and oilseeds. And Autonomous Establishment of Control and Coordination for Export (EACCE) is responsible for quality control of agricultural products for export.

V3.5 Agricultural Extension and Supporting Services in the Five Year Plan

The Moroccan Government has laid major emphasis on the development of agricultural extension services. If the present encroachment upon marginal land continues, there is a great danger of a further decline in fertility and the threat of soil erosion. Since the major portion of agricultural products rely almost exclusively on rain water, in years of unfavorable weather food shortage is more severe. Increasing demand of food, fodder and fuel has led to depletion of natural resources and increasing environmental degradation. The Five Year Plan document "The Document Project de Plan de Development Economique et Social: Periode 1999-2003, Commission, Development Agricole et Rural" December 1998, has outlined the following programs for the development of Agricultural Extension and Supporting Services.

- (1) The setting of a national committee for agricultural extension and regional committees to implement
- (2) Diversification of extension methods (closer approach in favorable area and development of research)
- (3) Consultation and dialogue with the rural population and popularization of female participation
- (4) Promotion of human resources working in the sector of extension through training and career plans
- (5) Functional liaisons between the service of extension and agricultural research and farmers' organizations
- (6) Strengthening technology transfer program
- (7) Setting up of a follow-up and evaluation system for extension programs
- (8) The integration of training, research and extension

V3.6 Agricultural Credit

Effective rural credit mechanism is a major incentive to farmers who need help. In Morocco, The National Agricultural Bank (La Caisse Nationale de Credit Agricole : CNCA) established in 1961, provides credit to the farmers as well as agricultural industries through its regional branches (CRCA:Caisse Regionale de Credit Agricole) and local branches (CLCA: Caisse Locale de Credit Agricole).

CNCA is represented in other parts of the country by 9 DRDs (DRD: Decentralized Regional Directorate), 81CRCAs and 285 CLCAs of which 132 are permanently established and 153 are temporarily established. The institutional arrangements for agricultural credit are illustrated in Figure V3.6.1.

CNCA is the biggest lending agency for the agricultural sector in Morocco. It is the main source of credit in rural areas.

CNCA provides credit both the large scale and small-scale farmers. Loans are provided for agricultural production such as the purchase of seeds, fertilizer, insecticide, farming machinery and land improvement.

It also grants loans for domestic marketing of products, product processing, packing and exports as well as fishing, forestry and rural tourism.

The maximum amount of the loan to be provided by the Bank depends upon various factors i.e., risk factor, types of customers, types of the loan to be granted and mortgage capacity of the farmers. Credit is provided for short term (1 year or less) medium term (less than 5 years) and for long term (more than 5 years) and the rate of interest varies between 9% and 12 % according to the period and the types of loans provided. Farmers who need comparatively small amount of loan use CLCA and big farmers as well as agricultural industries that need big amount use CRCA.

The outstanding loans in 1999 were 18 billion DH and recovery rate was about 70%. The credits granted by the CNCA only represent 14% to 20 % of the agricultural funding needs while commercial banks contribute up to 3%. Although farmers in Morocco utilize non-institutional loans that are from relatives or friends without paying any interests, its share is estimated very nominal.

CNCA also provides banking services, such as deposits, saving accounts, letters of guarantee and currency exchange. The main sources of funds are borrowings from international development agencies, deposits and bonds.

V3.7 Agricultural Marketing

V3.7.1 Marketing of Agricultural Products

The marketing system of all agricultural commodities have been fully liberalized, however there exists some control for soft quality wheat the staple in Morocco. The government has a policy to keep 10 thousand tons of soft quality wheat for lower income families. The official routes of cereal crops' marketing are illustrated in Figure V3.7.1.

As shown in the Figure, ONICL (L'Office Nationale Interprofessionelle des Cereals et des Legumineuses) under the supervision of Ministry of Agriculture, Rural Development and Fisheries gives order to CAM/UNCAM or authorized dealers for distribution, collection, imports and exports and it pays for transportation and storage charges. Loans to purchase cereals are available from CNCA or other commercial banks.

The general flow of soft quality wheat and other cereals are shown in the Figure V3.7.2 (a) and (b). It is estimated that about 80% of the soft quality wheat goes through the free markets. The share of soft quality wheat collected by cooperatives is in decreasing trend. In 1986 it was about 50% and in 1996 it declined to 20%, while the share of traders and mills is in increasing trend (refer to Table V3.7.1). Mills were authorized to collect only from 1994.

Private small traders dominate the marketing of other food crops, including vegetables, fruits and livestock products. The procurement at village level is typically direct contact between traders and farmers. There are weekly markets called Souk in the rural areas. Most of the agricultural products are sold there. Some retailers from the town area contact those markets for vegetables, fruits and food grains collection. The price determination occurs by means of bargaining. The marketing of industrial crops like olive and sunflower is quite different. Agro industries make direct contact with the producer or buy through the farmers' cooperatives.

V3.7.2 Marketing of Agricultural Inputs

The marketing of agricultural inputs, i.e., fertilizer and pesticides has been completely liberalized. Government roles are confined to provision of market information, monitoring of market performances, quality control, research and promotion etc. However, government subsidies for cereal seeds. Fertilizer that is the mixture of imports and domestic production is distributed through FERTIMA and other sources.

The distribution routes of fertilizers are illustrated in Figure V3.7.3. It is estimated that about 70% of fertilizer is distributed through the nationwide network of FERTIMA. There are also other private companies who import directly from foreign countries or buy from the main supplier and sell it in retail.

More than 50% of the fertilizers are imported which is in increasing trend (refer to Table V3.7.2). In 1998/99 418,150 ton was imported. The importation share of Ammonium Nitrate (33.5%) was the biggest followed by Urea (46%) Sul Amm (21%). The domestic production of ASP (14-28-14) was the biggest followed by SSP (18%), ASP (19-38-0) and DAP (18-46-0).

Other agro chemicals and seeds are obtained through authorized private shops and there is an association of seed traders (SONACOS). There is an annual variation in sales quantity due to the weather conditions. Sales quantity of major cereals is shown in Table V3.7.3.

V3.7.3 Prices of Farm Products and Inputs

The Moroccan government has gradually liberalized the prices of agricultural products since 1982 and since 1990 prices of all agricultural products except for some quantity of soft wheat were liberalized. The farm-gate prices of staples like soft quality wheat, hard quality wheat as well as vegetables and fruits show wide regional variations (refer to Table V3.7.4).

Concerning monthly average market prices of agricultural products there is extreme fluctuations over short time periods and wide seasonal variations. The price of soft quality wheat was highest in the months of January, March and April (2.8 DH/kg) and lowest in the month of July (2.5 DH/kg). In case of hard quality wheat the highest price was 3.3 DH /kg in April and the lowest was 3.1 DH/kg in Jun, July, August, September and October. The prices of other vegetables and fruits show extreme fluctuations over short time periods and seasonal variations (refer to Table V3.7.5).

The prices of fertilizers have been liberalized from 1990 and the rate of subsidy for seeds has been reduced from 1988. The prices of fertilizers also show (refer to Table V3.7.6). The prices of major cereal seeds are shown in Table V3.7.7.

V3.8 Farmers' Organizations

In local level, Work Centers, which are the grass level extension centers under the Ministry of Agriculture, Rural Development and Fisheries as described before and ORMVA initiate, assist and help farmers to organize, form cooperatives or associations.

According to the documents Project de Plan de Development Economique et Social: Periode 1999-2003, Commission “Development Agricole et Rural” December 1998, presently there are 4,288 professional organizations distributed into 2,828 autonomous cooperatives, 713 agrarian reform cooperatives, 180 producers’ associations and 540 water users’ associations.

There are several professional farmers’ organizations in rural areas, such as service cooperatives, dairy cooperatives, sheep breeding, apple marketing cooperatives etc. In irrigated areas there are water users’ associations (AUEA) either recognized or traditional. Even traditional associations have internal regulations transmitted from generations to generation. Those associations take care of all the management problems, planning, allocation of irrigation water and maintenance of canal etc. The management cycle of water user’s association is illustrated in the Figure V3.8.1. On the top there is a subscribers’ committee or general meeting, which discusses various problems and sets activities or plans. Those plans are implemented and evaluated.

According to the above-mentioned document, the major actions undertaken to strengthen the agricultural cooperatives and professional associations are as follows;

- (1) Working out an action plan for the reform, adjustment and development of cereal cooperatives dealing mainly with the improvement of management tools, the upgrading of production capacities and the extension of farmers’ participation;
- (2) Achievement of studies and audits regarding wine-producing cooperatives and some milk cooperatives
- (3) The follow-up of the main cooperatives management
- (4) The development of partnership with some professional associations in the sectors of stockbreeding, oleaginous plants and seeds
- (5) The elaboration of work-plans for the development of professional organizations in the sector of olives, sugar, oleaginous, textiles and seeds plants etc.

There are 37 Chambers of Agriculture in 16 Economic Regions in the country and there is a Federation of Chamber of Agriculture established in 1919 and reorganized in 1962 soon after the independence. Its major role is to be the bridge between the government and the farmers.

*Feasibility Study on Water Resources Development in
Rural Area in
the Kingdom of Morocco
Final Report*

*Volume III Supporting Report (1)
Basic Study
Supporting Report V
Soils, Agriculture and Irrigation*

Tables

Table V1.1.1 Typical Soil Features in Moroccan Soil Classification

Moroccan Soil Classification	Profile	Typical Feature	Other Soil Classification or Common soil name
1) Sol Mineraux Bruts	(A)C, (A)R or R	Organic matter almost absent in A horizon	Entisols, Lithosols, Regosols, Dunes
2) Sol peu Evolues	AC	A horizon 10-30 cm, in which organic matter may be relatively abundant	Entisols, Aridisols, Rankers, Grey sub-desert soils
3) Sol Vertisols	A(B)C, A(B)gC, A(B)Cg	Dark, heavy, clay soils with 2:1 -type clay minerals; prismatic structure, deep-cracking when dry, swelling, self-mulching	Vertisol
4) Sol Andosols	A(B)C	Volcanic soils with high allophane content in the colloidal fraction and high organic matter content	Inceptisol, Andosol
5) Sol Calcimagnesiques	AR, AC, A(B)r or A(B)C	Stable humus in A horizon and characteristic dominance of Ca or Mg.	Inceptisols, Mollisols, Rendzina, Brown Calcareous soils,
6) Sol Isohumiques	A(B)C, sometimes ABC	High calcium saturation; humus penetration into at least the upper half of the profile or at least 30-40 cm deep.	Inceptisols, Mollisols, Brown and Red-Brown soils, Brunizems, Chernozems, Sierozems, Chestnut soils
7) Sol Brunifiers	A(B)C, ABC	Mull or moder type of humus. Brown eutrophic soil, brown soil with B-structure, (with weak A2 and B texture).	Inceptisols, Alfisols, Grey Forest soils
8) Sol Podozolises	ABC	Mor or moder type of humus. A horizon ash-grey, strongly leached and impoverished; pronounced textural/ferruginous B	Spodosols, Podzols, podzolic soils
9) Sol a Sesquioxides de Fer	ABC, A(B)C	Rich in sesquioxides and hydroxides, oxides mostly of Fe and Mn, silica:alumina ratio greater than 2	Alfisols, Red brown Mediterranean soil
10) Sol Ferrallitiques		Associated with higher annual rainfall and forest cover. Strongly weathered, red and porous soils. Sesquioxides coating and cementing of clay particles (Pseudo-texture). Silica: alumina ratio less than 2; low CEC. Chemical fertility of these soils is low	Oxisols
11) Sol Hydromorphes		Development and characteristics dominated by temporary or permanent waterlogging: gley and/or peat formation.	Alfisols, Inceptisols
12) Sol Sodiques		Soils that contain an excess of salts or exchangeable Na, or both.	Aridisols, Inceptisols, Entisols

Source: Ministry of Agriculture, Rural Development and Fisheries
Agricultural Compendium, Elvevier, 1981

Table V1.1.2 Standard Criteria of Classification of Land Suitability

Slope		
Symbol	Level (%)	Class
		Gravity Sprinkler
Pe6	> 8	V IV
Pe5	4 - 8	V III
Pe4	2 - 4	IV I
Pe3	1.5-2	III I
Pe2	1-1.5	II I
Pe1	< 1	I I

Flood condition		
Symbol	Risk of Flood	Class
I1	None	I
I2	Light	II
I3	Moderate	III
I4	Important	IV
I5	Very Importa	V

Salinity		
Symbol	Level (mmho/cm in ext.)	Class
R1	>32	V
R2	16-32	IV
R3	8 - 16	III
R4	4 - 8	II
R5	<4	I

Hydraulic Erosion		
Symbol	Condition	Class
Eh5	No use	V
Eh4	Strong erosion	IV
Eh3	Moderate erosion	III
Eh2	Low erosion	II
Eh1	No erosion	I

Micro topography		
Symbol	Relief Level (cm)	Class
		Gravity Sprinkler
M1	0-15	I I
M2	15-30	II I
M3	30-60	III II
M4	60-120	IV III
M5	>120	V IV

Active Limestone	
Class	Level (%)
Ca1	< 7
Ca2	7 - 15
Ca3	15 - 25
Ca4	>25

Alkalinity		
	Level (Na/CEC)	Class
A5	>30%	V
A4	20-30	IV
A3	15-20	III
A2	11 - 15	II
A1	<10%	I

Permeability		
Symbol	Level K:cm/h	Class
	Gravity Sprinkler	
K5	<0.5	V IV
K4	0.5-1	IV II
K3	1 - 2	III I
K1	2 - 10	I I
K2	10 - 20	II II
K4	20<	IV IV

Drainage		
Symbol	K	Condition
		Class
D1	>2m/day	Normal purification I
D2	1 - 2	Important purification II
D3	0.1 - 1	Very import. purification III
D4	0.05 - 0.1	Normal drainage IV
D5	>0.05	Intensive drainage V

Texture		
Symbol	Texture	Class
		Gravity Sprinkler
T4	S	IV III
T3	SL	III II
T2	SiL,	II II
T1	SC, SCL, L, LS, SiLS	I I
T2	C, CL, LC, SiCL	II I
T3	HC	III II
Tg2	Gravel (10-25%)	II II
Tg3	Gravel (25-50%)	III III
Tg4	Gravel (50-75%)	IV IV

Gravel : 2mm – 9cm

Soil Depth					
Condition in profile	Soil depth (cm) and Class				
	P4 0-20	P3 20-40	P2 40-60	P1 60-80	P'1 >80
Z	IV	III	II	I	I
S	V	IV	III	II	I
H	-	-	-	-	-

Z: Rough material >75%, no reinforced pan

S: The area where limestone, thickness >30cm, contents >50%

H: The area where found hard limestone within 10cm

Stone (%)	S/SS	C1(SS)	C2(SS)	C3(SS)	C4(SS)
C1 0-10	C1(S)	I	II	III	IV
C2 10-25	C2(S)	II	II	III	IV
C3 25-50	C3(S)	III	III	III	IV
C4 50-75	C4(S)	IV	IV	IV	IV
Z >75	-	-	-	-	-

S/SS: Surface (0-20)/Sub-surface (20-40)

Table V2.1.1: Afforested and Natural Forest Area in Morocco

(Unit: ha)

	Existing Afforested										Total	
	Area 1996-97	Conifer				Hard Wood (1998)						
		Cedar	Thuja	Pine	Juniper	Sub-Total	Green Oak	Cork	Olk	Zene	Argan	Forest Area
Zone I												
Al Hoceima	19,991	8,637	4,632	119	13	13,401	45,315	16,814	-	-	62,129	95,521
Boulemane	1,175	6,196	12,916	2,179	7,086	28,377	53,849	94	-	-	53,943	83,495
Chefchaouen	20,164	2,857	6,080	1,676	40	10,653	32,739	71,724	3,135	-	107,598	138,415
El Hajeb	8,698	49	1,538	-	-	1,587	21,000	317	560	-	21,877	32,162
Fes	1,472	1,541	20,572	-	-	22,113	48,569	-	40	-	48,609	72,194
Ifrane	7,535	37,969	79	-	341	38,389	52,444	60	690	-	53,194	99,118
Meknes	2,880	-	-	-	-	-	-	-	-	-	-	-
Sidi Kacem	7,645	-	-	-	-	-	-	4,597	-	-	4,597	-
Taounate	10,237	-	-	26	-	26	19,195	37,149	103	-	56,447	66,710
Taza	25,262	8,050	30,373	39,520	34,111	112,054	151,982	15,440	1,208	-	168,630	305,946
Sefrou	7,235	-	-	-	-	-	-	-	-	-	-	-
Zone II												
Ben Slimane	8,967	-	9,175	-	-	9,175	90	38,519	-	-	38,609	56,751
Casablanca	3,046	-	-	-	-	-	-	-	-	-	-	-
Khemisset	46,653	-	43,363	-	241	43,604	50,139	66,730	-	-	116,869	207,126
Rabat-Sale	8,882	-	3,714	-	-	3,714	-	23,702	-	-	23,702	36,298
Zone III												
Azilal	8,014	1,032	25,618	14,455	20,510	61,615	152,829	37	-	-	152,866	222,495
Beni Mellal	4,967	2,196	904	12,294	6,759	22,153	111,658	163	-	-	111,821	138,941
El Jadida	25,825	-	-	-	1,497	1,497	582	-	-	-	582	27,904
El Kelaa Des Straghna	2,946	-	-	-	-	-	-	-	-	-	-	-
Essaouira	13,090	-	95,570	-	12,847	108,417	13,695	-	-	131,671	145,366	266,873
Khouribga	10,834	-	21	-	-	21	13,331	1,068	-	-	14,399	25,254
Marrakech	9,853	-	36,864	1,535	44,830	83,229	136,011	77	-	5,961	142,049	235,131
Safi	13,467	-	-	-	-	-	-	-	-	351	351	-
Settat	9,625	-	5,861	-	-	5,861	819	1,186	-	-	2,005	17,491
Chichaoua	3,227	-	-	-	-	-	-	-	-	-	-	-
Zone IV												
Agadir	4,526	-	65,190	-	1,385	66,575	22,998	-	-	220,759	243,757	314,858
Ouarzazate-Zagoura	1,510	-	-	-	4,809	4,809	17,661	-	-	-	17,661	23,980
Tiznit	1,163	-	61,423	-	-	61,423	8,447	-	-	141,377	149,824	212,410
Taroudannt	5,378	-	49,582	-	33,960	83,542	103,562	-	-	367,991	471,553	560,473
Zone V												
Er Rachidia	607	356	1,310	-	16,089	17,755	20,161	-	-	-	20,161	38,523
Figuig	10,093	-	-	-	22,546	22,546	152	-	-	-	152	32,791
Total	502,359	133,654	565,798	82,115	244,836	1,026,403	1,415,201	377,481	9,091	871,210	2,672,983	4,201,745

Source: Annuaire Statistique du Maroc, 1999, Ministere de la Prevision Economique et du Plan

Table V2.1.2: The Cultivated Area and Production of Wheat (Hard)

Province <i>a/</i>	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
Zone I									
Al Hocima	5.4	5.2	1.0	4.7	3.5	0.8	2.6	3.0	1.2
Boulemane	8.7	7.4	0.9	8.3	6.8	0.8	8.3	5.9	0.7
Chefchaouen	7.0	8.5	1.2	2.5	1.6	0.6	7.1	6.5	0.9
El Hajeb	13.4	25.3	1.9	6.1	6.5	1.1	11.4	22.2	2.0
Fes	52.2	99.7	1.9	36.5	32.5	0.9	40.6	71.6	1.8
Ifraue	22.1	29.4	1.3	17.0	15.6	0.9	22.0	24.4	1.1
Meknes	7.3	14.8	2.0	17.3	17.7	1.0	4.7	8.1	1.7
Kenitra+ Sidi Kacem	40.8	55.8	1.4	32.4	32.3	1.0	27.6	48.5	1.8
Taounate	82.7	124.9	1.5	55.5	45.5	0.8	69.6	98.1	1.4
Taza	79.0	132.7	1.7	65.6	55.1	0.8	80.3	124.5	1.6
Zone II									
Ben Slimane	47.0	107.2	2.3	30.0	29.7	1.0	38.5	78.9	2.1
Casablanca	11.8	32.1	2.7	8.4	6.7	0.8	9.2	13.0	1.4
Khemisset	47.9	86.7	1.8	30.9	24.1	0.8	40.0	67.2	1.7
Rabat	3.5	5.4	1.5	3.1	1.6	0.5	2.8	2.2	0.8
Zone III									
Azilal	23.9	37.0	1.5	19.9	16.1	0.8	26.3	23.0	0.9
Beni Mellal	52.3	122.2	2.3	47.1	61.2	1.3	35.1	70.3	2.0
El Jadida	94.0	209.6	2.2	69.2	106.9	1.5	85.4	134.0	1.6
El Kalaa des Straghna	80.0	149.5	1.9	79.3	73.5	0.9	82.5	105.9	1.3
Essaouira	8.1	11.0	1.4	7.6	3.6	0.5	9.6	8.2	0.9
Khouribga	30.6	42.8	1.4	27.3	17.8	0.7	22.0	18.9	0.9
Marrakech	66.5	108.8	1.6	53.0	28.7	0.5	42.5	17.4	0.4
Safi	95.6	134.8	1.4	72.8	45.9	0.6	92.1	81.1	0.9
Settat	191.5	463.4	2.4	134.5	122.4	0.9	179.5	346.4	1.9
Zone IV									
Agadir	7.8	22.1	2.8	6.9	10.0	1.5	9.7	15.2	1.6
Ouarzazate	1.5	2.6	1.8	1.3	1.7	1.3	0.1	0.2	1.9
Tiznit	0.5	0.6	1.2	0.1	0.0	0.2	0.6	0.1	0.1
Zone V									
Er Rachidia	11.5	29.7	2.6	11.1	23.3	2.1	10.2	17.9	1.8
Figuig	2.6	3.7	1.4	1.9	1.3	0.7	1.3	1.2	0.9
Total in Moroc	1,248.9	2,269.8	1.8	972.1	881.6	0.9	1,126.5	1,544.4	1.4

Note: a/ : The data shows only for provinces related to the area of Zone
Source: Aannuaire Statistique du Maroc, 1999, Ministere de la Prevision Economique et du Plan

Table V2.1.3: The Cultivated Area and Production of Wheat (Soft)

Province n°	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
Zone I									
Al Hoceima	15.5	21.1	1.4	10.0	5.5	0.6	13.4	14.1	1.1
Boulemane	7.3	6.4	0.9	4.7	5.1	1.1	4.5	2.6	0.6
Chechouen	32.0	45.1	1.4	20.7	13.5	0.7	38.6	39.0	1.0
El Hajeb	28.5	49.6	1.7	18.4	22.1	1.2	45.7	109.2	2.4
Fes	77.3	140.7	1.8	55.5	53.8	1.0	87.3	179.8	2.1
Ifra	19.6	28.4	1.5	10.5	10.0	1.0	16.7	15.4	0.9
Meknès	93.7	214.6	2.3	44.7	48.3	1.1	84.1	143.0	1.7
Kenitra+ Sidi Kacem	254.7	443.7	1.7	180.1	197.9	1.1	199.7	394.1	2.0
Taounate	91.2	152.3	1.7	65.3	58.1	0.9	102.6	164.2	1.6
Taza	26.5	34.2	1.3	19.2	18.4	1.0	32.4	40.8	1.3
Zone II									
Ben Slimane	54.1	122.8	2.3	25.0	28.8	1.2	55.9	134.7	2.4
Casablanca	19.8	54.4	2.7	12.8	11.9	0.9	26.4	61.3	2.3
Khemisset	149.8	311.6	2.1	120.0	117.6	1.0	145.0	268.3	1.9
Rabat	18.3	39.9	2.2	13.3	8.7	0.7	25.7	29.0	1.1
Zone III									
Azilal	12.1	20.1	1.7	10.1	11.5	1.1	15.3	14.5	0.9
Beni Mellal	173.3	424.2	2.4	157.7	196.5	1.2	173.1	353.0	2.0
El Jadida	83.4	181.1	2.2	60.6	109.1	1.8	83.6	107.8	1.3
El Kalaa des Stragha	156.2	255.8	1.6	160.1	107.0	0.7	182.3	188.8	1.0
Essaouira	11.4	12.5	1.1	11.0	4.8	0.4	11.7	6.7	0.6
Khouribga	61.1	92.9	1.5	40.6	35.3	0.9	45.6	49.7	1.1
Marrakech	70.9	115.0	1.6	62.5	22.0	0.4	58.6	24.8	0.4
Safi	105.5	136.1	1.3	98.0	52.9	0.5	94.8	65.4	0.7
Settat	135.0	336.2	2.5	85.9	91.9	1.1	142.5	219.5	1.5

Note: a/ : The data shows only for provinces related to the area of Zone
Source:Aannuaire Statistique du Maroc, 1999, Ministere de la Prevision Economique et du Plan

Table V2.1.4: The Cultivated Area and Production of Barley

Province /	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
Zone I									
Al Hoceima	71.4	123.5	1.7	57.2	48.1	0.8	68.8	75.7	1.1
Boulemane	19.1	33.2	1.7	15.3	13.6	0.9	11.5	10.9	1.0
Chechoua	20.0	27.4	1.4	18.1	10.0	0.6	17.8	15.7	0.9
El Hajeb	13.3	22.5	1.7	6.1	8.1	1.3	9.9	14.1	1.4
Fes	39.7	64.8	1.6	31.4	31.1	1.0	38.0	48.6	1.3
Ifra	27.6	45.5	1.7	21.3	22.4	1.1	21.8	16.4	0.8
Meknes	9.2	15.1	1.6	5.3	4.5	0.9	7.4	10.7	1.5
Kenitra+	23.7	33.3	1.4	15.8	14.1	0.9	17.7	18.0	1.0
Sidi Kacem									
Taounate	39.1	55.5	1.4	42.7	35.9	0.8	49.5	47.5	1.0
Taza	123.0	220.2	1.8	86.7	62.4	0.7	108.4	122.5	1.1
Zone II									
Ben Slimane	22.3	45.5	2.0	18.5	19.4	1.1	18.5	28.5	1.5
Casablanca	14.3	27.3	1.9	10.3	8.5	0.8	11.4	17.0	1.5
Khemisset	65.7	124.8	1.9	45.5	33.7	0.7	58.5	72.0	1.2
Rabat	12.3	17.6	1.4	12.0	5.5	0.5	5.9	6.4	1.1
Zone III									
Azilal	91.8	147.4	1.6	85.0	61.0	0.7	85.3	70.0	0.8
Beni Mellal	46.8	88.2	1.9	40.8	35.8	0.9	44.5	46.1	1.0
El Jadida	110.8	164.3	1.5	102.7	95.9	0.9	141.3	114.3	0.8
El Kalaa des des Sraghna	165.9	242.1	1.5	159.9	81.3	0.5	232.2	171.7	0.7
Essaouira	194.0	277.4	1.4	148.7	86.3	0.6	170.3	103.9	0.6
Khouribga	123.9	232.9	1.9	105.5	92.8	0.9	106.4	137.3	1.3
Marrakech	24.9	404.2	1.6	211.7	88.0	0.4	234.9	99.2	0.4
Safi	182.4	266.3	1.5	176.2	112.8	0.6	192.6	131.0	0.7
Settat	172.8	335.2	1.9	121.3	105.5	0.9	167.1	259.0	1.6
Zone IV									
Agadir	125.2	160.2	1.3	96.3	42.9	0.4	155.6	54.8	0.4
Ouarzazate	26.0	49.9	1.9	25.6	53.3	2.1	25.6	32.0	1.3
Tiznit	85.8	151.9	1.8	60.7	19.4	0.3	94.9	8.5	0.1

Note: a/: The data shows only for provinces related to the area of Zone
Source:Aannuaire Statistique du Maroc, 1999, Ministere de la Prevision Economique et du Plan

Table V2.1.5: The Cultivated Area and Production of Broad Bean

Province ^{a/}	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
Zone I									
Al Hoceima	2.1	1.1	0.5	1.6	0.2	0.2	1.9	0.7	0.4
Boulemane	1.9	4.0	2.1	3.0	1.2	0.4	3.3	2.0	0.6
Chefchaouen	3.1	2.9	0.9	2.8	0.8	0.3	2.4	0.9	0.4
El Hajeb	2.3	1.2	0.5	2.0	1.0	0.5	2.8	2.0	0.7
Fes	14.6	13.1	0.9	17.0	6.5	0.4	20.1	8.2	0.4
Ifrane	0.3	0.1	0.3	3.3	3.0	0.9	0.7	0.4	0.6
Meknes	4.4	2.6	0.6	2.9	1.3	0.5	4.6	2.0	0.4
Kenitra+	6.4	4.2	0.7	10.4	2.6	0.2	4.9	1.9	0.4
Sidi Kacem	34.4	26.8	0.8	33.1	9.9	0.3	37.5	21.4	0.6
Taounate	22.5	34.0	1.5	10.1	4.2	0.4	24.3	21.4	0.9
Taza	-	-	-	-	-	-	-	-	-
Zone II									
Ben Slimane	0.9	0.8	0.8	3.7	3.3	0.9	2.3	2.1	0.9
Casablanca	0.5	0.6	1.1	0.3	0.1	0.5	0.8	0.4	0.5
Khemisset	2.0	1.4	0.7	2.4	0.5	0.2	7.3	3.7	0.5
Rabat	0.2	0.1	0.7	0.4	0.1	0.4	0.2	0.1	0.4
Zone III									
Azilal	0.6	1.1	1.9	0.8	1.1	1.4	0.9	1.6	1.8
Beni Mellal	5.1	5.2	1.0	12.7	15.8	1.2	4.8	6.3	1.3
El Jadida	6.0	6.6	1.1	5.3	1.8	0.3	1.1	1.1	1.0
El Kalaa des Straghna	7.8	11.6	1.5	14.5	16.8	1.2	12.4	11.4	0.9
Essaouira	-	-	-	2.3	0.2	0.1	3.7	0.4	0.1
Khouribga	-	-	-	-	-	-	-	-	-
Marrakech	2.6	2.6	1.0	3.1	0.8	0.3	1.9	0.9	0.5
Safi	2.5	2.2	0.9	6.0	3.8	0.6	6.6	4.6	0.7
Settat	9.7	9.7	1.0	9.5	8.3	0.9	11.5	9.1	0.8
Zone IV									
Agadir	0.6	0.2	0.4	0.7	1.0	1.5	0.1	0.1	0.6
Ouarzazaate	2.3	8.9	3.9	2.2	5.5	2.5	0.9	1.9	2.1
Tiznit	-	-	-	-	-	-	-	-	-
Zone V									
Er Rachidia	1.2	2.0	1.6	1.6	2.1	1.3	1.9	2.5	1.3
Figuig	-	-	-	0.2	0.3	1.4	0.2	0.1	0.4
Total	135.1	143.5	1.1	153.2	93.0	0.6	160.9	107.7	0.7

Note: ^{a/}: The data shows only for provinces related to the area of Zone

Source:Aannuaire Statistique du Maroc, 1999, Ministere de la Prevision Economique et du Plan

Table V2.1.6: The Cultivated Area and Production of Green Peas

Province ^{a/}	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
Zone I									
Al Hoceima	0.5	0.4	0.9	1.2	0.1	0.1	1.3	0.3	0.2
Boulemane	-	-	-	0.1	0.0	0.3	-	-	-
Chefchaouen	1.2	0.5	0.4	0.6	0.2	0.3	0.5	0.3	0.5
El Hajeb	0.5	0.2	0.5	0.1	0.1	0.5	0.9	0.6	0.7
Fes	4.4	3.1	0.7	2.8	0.4	0.2	2.5	1.3	0.5
Ifrane	0.1	0.0	0.3	0.1	0.1	0.8	-	-	-
Meknes	0.3	0.2	0.6	4.4	1.8	0.4	1.7	0.9	0.5
Kenitra+	0.4	0.1	0.3	1.4	0.7	0.5	0.8	0.2	0.2
Sidi Kacem	2.0	2.2	1.1	2.3	0.3	0.1	2.6	1.4	0.5
Taounate	-	-	-	-	-	-	-	-	-
Taza	-	-	-	-	-	-	-	-	-
Zone II									
Ben Slimane	0.4	0.4	1.0	1.6	0.7	0.4	2.9	1.2	0.4
Casablanca	0.1	0.1	1.2	0.7	0.2	0.2	0.4	0.2	0.5
Khemisset	2.0	0.9	0.5	2.5	0.8	0.3	4.5	1.8	0.4
Rabat	-	-	-	-	-	-	-	-	-
Zone III									
Azilal	0.8	1.2	1.5	0.6	0.6	1.0	0.9	0.6	0.7
Beni Mellal	1.2	1.2	1.0	1.5	0.6	0.4	1.6	0.8	0.5
El Jadida	6.4	8.0	1.3	5.4	0.7	0.1	-	-	-
El Kalaa des Straghna	0.1	0.1	0.7	1.9	2.3	1.2	3.7	3.3	0.9
Essaouira	-	-	-	-	-	-	-	-	-
Khouribga	-	-	-	-	-	-	-	-	-
Marrakech	0.9	0.7	0.8	-	-	-	1.3	0.6	0.5
Safi	4.8	3.7	0.8	6.5	3.6	0.6	7.9	5.5	0.7
Settat	3.0	3.5	1.2	3.3	2.5	0.8	3.5	2.2	0.6
Zone IV									
Agadir	0.2	0.6	3.1	-	-	-	0.5	0.4	0.7
Ouarzazaate	-	-	-	0.1	0.1	1.4	-	-	-
Tiznit	-	-	-	-	-	-	-	-	-
Zone V									
Er Rachidia	-	-	-	-	-	-	-	-	-
Figuig	-	-	-	-	-	-	-	-	-
Total	30.0	27.6	0.9	37.5	15.8	0.4	38.3	21.8	0.6

Note: ^{a/}: The data shows only for provinces related to the area of Zone

Source:Aannuaire Statistique du Maroc, 1999, Ministere de la Prevision Economique et du Plan

Table V2.1.7: The Cultivated Area and Production of Lentil

Province ^{a/}	1995-96			1996-97			1997-98		
	Area (x1000ha)	Production (ton)	Yield (ton/ha)	Area (x1000ha)	Production (ton)	Yield (ton/ha)	Area (x1000ha)	Production (ton)	Yield (ton/ha)
Zone I									
Al Hoceima	2.0	1.7	0.9	1.5	1.7	1.2	1.8	0.4	0.2
Boulemane	1.0	0.6	0.6	0.8	0.5	0.6	1.1	0.6	0.5
Chefchaouen	0.4	0.1	0.4	0.8	0.2	0.3	1.0	0.3	0.3
El Hajeb	1.1	0.7	0.6	2.5	1.1	0.5	2.1	1.1	0.5
Fes	0.9	0.7	0.8	1.1	1.2	1.1	2.0	1.1	0.6
Ifrane	0.1	0.0	0.4	1.5	-	-	1.7	0.6	0.4
Meknes	3.5	2.5	0.7	2.0	0.7	0.4	2.7	1.6	0.6
Kenitra+	1.7	0.4	0.2	-	8.5	-	-	-	-
Sidi Kacem	3.4	2.7	0.8	2.4	1.1	0.5	3.8	2.1	0.6
Taounate	2.9	3.5	1.2	1.6	0.3	0.2	6.4	2.2	0.4
Zone II									
Ben Slimane	3.7	3.4	0.9	7.6	3.8	0.5	4.8	2.3	0.5
Casablanca	-	-	-	0.3	0.2	0.6	-	-	-
Khemisset	12.0	7.2	0.6	18.4	-	-	14.3	5.7	0.4
Rabat	-	-	-	-	-	-	-	-	-
Zone III									
Azilal	1.7	1.7	1.0	1.6	0.7	0.4	2.1	1.5	0.7
Beni Mellal	0.1	0.0	0.4	-	-	-	-	-	-
El Jadida	0.1	0.2	0.4	-	-	-	-	-	-
El Kalaa des Straghna	0.1	0.2	2.0	-	0.9	-	-	-	-
Essaouira	-	-	-	-	-	-	-	-	-
Khouribga	-	-	-	-	-	-	-	0.2	0.1
Marrakech	2.0	0.5	0.3	0.7	0.1	0.2	0.4	0.1	0.3
Safi	1.0	0.7	0.7	0.9	0.5	0.6	0.8	0.2	0.3
Settat	7.7	8.6	1.1	8.0	5.1	0.6	9.2	5.0	0.5
Zone IV									
Agadir	0.1	0.1	0.8	-	-	-	-	-	-
Ouarzazaate	-	-	-	-	-	-	-	-	-
Tiznit	-	-	-	-	-	-	-	-	-
Zone V									
Er Rachidia	-	-	-	-	-	-	-	-	-
Figuig	-	-	-	-	-	-	-	-	-
Total	16.0	12.5	0.8	13.5	7.4	0.5	15.6	6.8	0.4

Note: ^{a/}: The data shows only for provinces related to the area of Zone

Source:Aannuaire Statistique du Maroc, 1999, Ministere de la Prevision Economique et du Plan

Table V2.1.8: Vegetable Cultivation on Open Field in Morocco (1998/1999)

	Cultivated Area (ha)										Production (ton)										Yield (ton/ha)										
	Potato	Tomato	onion	Carrot	Radish	Pepper	Sweet Melon	Water Melon	Squash	Artichoke	Potato	Tomato	onion	Carrot	Radish	Pepper	Sweet Melon	Water Melon	Squash	Artichoke	Potato	Tomato	onion	Carrot	Radish	Pepper	Sweet Melon	Water Melon	Squash	Artichoke	
	ORMVA	Doukkala	4,230	1,550	1,175	1,415	620	460	1,550	1,010	76,440	124,970	7,400	47,880	23,320	4,980	3,650	36,660	11,580	18,800	22.3	29.5	4.8	40.7	16.5	8.0	7.9	23.7	11.5	12.5	
Doukkala	1,590	1,280	1,170	620	500	3,610	4,660	640	100	1,510	40,000	43,180	25,700	25,960	10,000	102,080	136,800	16,950	18,800	25.2	33.7	22.0	41.9	20.0	28.3	29.4	26.5	12.5			
Gharb	2,990	370	450	550	400	10	940	255	660	100	53,520	8,670	8,290	9,470	5,370	50	18,450	5,810	6,180	650	17.9	23.4	18.4	17.2	13.4	5.0	19.6	22.8	9.4	6.5	
Haouz	2,390						250	4,740	580		58,560					7,500	109,520	17,580			24.5						30.0	23.1	30.3		
Loukkos	3,210	400		360	125	30	350	50	235	470	74,010	10,250		8,370	2,480	480	4,820	640	4,680	8,390	23.1	25.6		23.3	19.8	16.0	13.8	12.8	19.9	17.9	
Moulouya	780	205	665	230	190	110	360		180		15,540	3,340	14,620	3,680	2,810	620	8,680		2,460		19.9	16.3	22.0	16.0	14.8	5.6	24.1		13.7		
Ouarazazate	1,620	225		290	220	60	330	1,600	285		43,740	11,250		8,700	1,290	9,940	72,180	8,550		27.0	50.0		30.0	39.6	21.5	30.1	45.1	30.0			
S. Massa	785	60	3,040	460	400	245	115	105			23,750	2,040	125,770				7,600	4,640	1,740			30.3	34.0	41.4	0.0	0.0		31.0	40.3	16.6	
Tadla	340	80	240	240	190	30	40	20	50		5,680	1,400	3,300	4,840	3,880	180	1,070	660	710		16.7	17.5	13.8	20.2	20.4	6.0	26.8	33.0	14.2		
Tafilalet																															
Sub-Total	17,140	6,850	7,115	3,925	3,440	4,720	12,125	4,810	2,525	2,080	391,240	205,100	185,080	108,900	56,580	117,180	300,530	155,120	35,900	27,840	22.8	29.9	26.0	27.7	16.4	24.8	24.8	32.2	14.2	13.4	
DPA																															
Al Hoceima	430	130	110	40	30	30	70				7,880	2,720	1,620	480	350	260	1,920				18.3	20.9	14.7	12.0	11.7	8.7	27.4				
Agadir	10		10	5	10						300		120	180							30.0		12.0	36.0	18.0						
Azilal	290	75	165	105	80	30			70		4,100	850	1,460	1,360	770	140			790		14.1	11.3	8.8	13.0	9.6	4.7		11.3			
Beni Mellal	780	60	450		190	30	30	100	110		14,820	630	7,580		3,230	260	600	3,000	1,260		19.0	10.5	16.8		17.0	8.7	20.0	30.0	11.5		
Ben Slimane	840	60	820	40	40	30			60	25	20,160	2,400	16,400	320	240	310			480	150	24.0	40.0	20.0	8.0	6.0	10.3		8.0	6.0		
Boulmane	1,590	65	50	40	60				10		19,080	850	400	360	540				120		12.0	13.1	8.0				12.0				
Casablanca	895	25	50	80					310		13,490	550	700	960					920		15.1	22.0	14.0	12.0					3.0		
Chefchaouen	2,450	660	690	110	100	20	210		60		25,520	11,520	13,340	500	930	30	710		450		10.4	17.5	19.3	4.5	9.3	1.5	3.4		7.5		
Chichaoua	170	110	40	60	50	10	400		85		2,040	1,870	600	1,200	750	40	10,000	1,020	540		12.0	17.0	15.0	20.0	4.0	25.0	12.0	18.0			
Dakhla																															
El Hajeb	3,700	120	3,350	310	250	100	110	15	70		73,500	480	79,480	8,370	5,750	900	240	270	450		19.9	4.0	23.7	27.0	23.0	9.0	2.2	18.0	6.4		
El Jadida	580	510	140	490	480	230	190	830	260		16,500	17,400	1,520	7,220	7,360	2,840	2,580	27,440	3,410		28.4	34.1	10.9	14.7	15.3	12.3	13.6	33.1	13.1		
El Kelaa	370	40	220	200	200			1,050	50	65	4,070	480	3,960	3,000	3,000		30,770	1,150	1,480		11.0	12.0	18.0	15.0	15.0		29.3	23.0	22.8		
Essaouira	460	2,000	150	100	10	25	10	50			7,270		20,000	2,100	1,200	100	450	180	800		15.8		10.0	14.0	12.0	10.0	18.0	16.0			
Fes	1,315	165	1,260	240	140	185	70	55	130		20,140	2,480	16,380	3,120	2,310	4,440	1,400	1,380	1,630		15.3	15.0	13.0	13.0	16.5	24.0	24.0	20.0	25.1	12.5	
Figuig	10	5	10		5				5		250	110	430		150				140		25.0	22.0	43.0				30.0		28.0		
Guelmim	70	60	50	50	50	10	20	70	30		1,050	1,200	700	700	150	400	400	2,100	530		15.0	20.0	14.0	14.0	14.0	15.0	20.0	30.0	17.7		
Ifra	600	50	700	50	50						6,000	300	5,600	200	200						10.0	6.0	8.0	4.0	4.0						
Khemisset	1,550	380	190	175	105	110	880	3,110	605		14,800	5,140	1,920	1,230	500	700	4,960	8,030	5,350		9.5	13.5	10.1	7.0	4.8	6.4	5.6	2.6	8.8		
Khenifra	3,560	110	140	100	100				20		38,760	1,030	1,450	1,900	1,900				240		10.9	9.4	10.4	19.0	19.0				12.0		
Khouribga	425	60	165	115	85	55					6,800	1,240	3,300	1,840	1,020	550			700		16.0	20.7	20.0	16.0	12.0				20.0		
Laayoune																															
Marrakech	270	45	105	60	75	15	10		15		4,780	1,000	970	520	580	70	420		10		17.7	22.2	9.2	8.7	7.7	4.7	42.0		0.7		
Meknes	1,020	280	2,350	300	225	145	560	135	230		23,820	5,400	38,900	5,120	1,880	1,430	4,040	1,700	2,260		23.4	19.3	16.6	17.1	8.4	9.9	7.2	12.6	9.8		
Nador	1,220	60	80	90	40	5	20		35		16,190	560	1,180	1,400	600	30	160		210		13.3	9.3	14.8	15.6	15.0	6.0	8.0		6.0		
Oujdaa	440	80	135	140	120	60	25		50		11,050	1,720	2,730	2,370	2,060	960	480		880		25.1	21.5	20.2	16.9	17.2	16.0	19.2		17.6		
Rabat-Sale	1,040	190	5	165	90	160			25	250	23,750	8,000	100	3,280	1,380	1,560		950	6,000		22.8	42.1	20.0	19.9	15.3	9.8		38.0	24.0		
Safi	200	45	2,470	340	70	15	10	140	40		5,170	1,540	59,280	18,670	1,280	350	50	1,960	1,000		25.9	34.2	24.0	54.9	18.3	23.3	5.0	14.0	25.0		
Sefrou	1,180	40	250	40	50	10	120		20		10,170	390	2,450	370	390	50	480		320		8.6	9.8	9.8	9.3	7.8	5.0	4.0		16.0		
Settat	6,080	50	2,740	1,415	790	20	15		370		133,760	650	33,140	35,940	16,980	280	300		5,700		22.0	13.0	12.1	25.4	21.5	14.0	20.0		15.4		
Sidi Kacem	50	40	200	140	60	80	300	200	20																						

Table V2.1.9: Cultivated Area and Production of Vegetables (1998/1999)

Crops	Cultivated Area (ha)			Production (ton)				
	Open Field in Spring	Greenhous e	Open Field in Winter	Total	Open Field in Spring	Greenhous e	Open Field in Winter	Total
Potato	51,715		10,500	62,215	945,780		195,000	1,140,780
Tomato	12,235	3,630	1,750	17,615	301,410	464,000	92,000	857,410
Onion	27,550			27,550	523,410			523,410
Carrot	9,695			9,695	220,850			220,850
Radish	7,745			7,745	118,220		3,500	121,720
Pepper	6,520	416	100	7,036	136,080	34,000		170,080
Sweet Melon	19,395	1,320		20,715	419,210	48,000		467,210
Water Melon	10,875			10,875	229,905			229,905
Squash	5,920	100	210	6,230	75,185	5,950	7,500	88,635
Green Bean	1,340	180	1,120	2,640	10,360	4,600	16,400	31,360
Green Peas	15,480			15,480	47,110			47,110
Garlic	1,935			1,935	9,940			9,940
Artichoke	2,165			2,165	28,330			28,330
Cauliflower	2,030			2,030	39,870			39,870
Cabbage	1,655			1,655	36,920			36,920
Cucumber	545	200		745	9,520	16,500		26,020
Sweet Potato	545			545	7,290			7,290
Mint	2,400			2,400	80,740			80,740
Board Bean	10,505		35	10,540	119,200		700	119,900
Eggplant	2,030		490	2,520	25,640		12,300	37,940
Beets	315			315	4,360			4,360
Strawberry		1,475		1,475		58,150		58,150
Hot Pepper		115	70	185		5,850	1,400	7,250
Asparagus			45	45			1,380	1,380
Others	17,305	320	410	18,035	230,150	14,850	5,320	250,320
Total	209,900	7,756	14,730	232,386	3,619,480	651,900	335,500	4,606,880

Source: Ministry of Agriculture, Rural Development and Fisheries, 2000

Table V2.1.10: Production of Fruits in Morocco

Crops		90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
Olive	Production	(1,000 ton)	369.0	550.0	380.0	418.0	450.0	350.0	800.0	550.0	650.0
	Area	(x1,000 ha)	365.0	380.0	395.0	412.0	430.0	450.0	480.0	500.0	520.0
Apple	Production	(1,000 ton)	248.8	278.0	309.0	210.0	310.0	364.0	384.0	284.8	292.2
	Area	(x1,000 ha)	22.0	23.6	25.6	26.4	26.6	26.8	27.0	28.0	27.8
Pear	Production	(1,000 ton)	30.9	31.0	30.0	29.2	26.0	30.0	39.7	31.1	50.2
	Area	(x1,000 ha)	3.0	3.2	3.4	3.4	3.4	3.5	3.6	4.0	4.0
Stone apple	Production	(1,000 ton)	24.5	24.5	24.0	28.6	20.0	25.0	24.5	29.5	30.9
	Area	(x1,000 ha)	2.4	2.4	2.7	2.8	2.7	2.8	2.8	2.9	2.9
Almond	Production	(1,000 ton)	13.4	11.0	9.4	6.1	9.4	6.7	17.4	12.0	16.0
	Area	(x1,000 ha)	110.0	117.1	119.8	124.9	127.3	132.3	134.6	139.0	139.0
Apricot	Production	(1,000 ton)	92.2	66.0	115.0	88.2	78.0	88.4	103.7	116.8	106.4
	Area	(x1,000 ha)	13.9	13.5	14.4	14.6	13.7	14.1	13.9	13.9	13.9
Peach	Production	(1,000 ton)	25.0	33.0	34.2	35.6	30.0	35.0	33.7	38.7	45.3
	Area	(x1,000 ha)	3.5	3.7	4.0	4.1	3.6	3.8	3.9	4.1	4.1
Plum	Production	(1,000 ton)	40.9	5.2	41.0	58.0	33.0	48.0	46.5	40.9	51.4
	Area	(x1,000 ha)	6.6	7.1	7.4	7.4	6.8	6.9	7.0	6.9	6.9
Cherry	Production	(1,000 ton)	2.7	4.5	2.3	2.1	1.4	3.2	7.1	7.2	7.1
	Area	(x1,000 ha)	0.6	0.6	0.7	0.7	0.8	0.9	0.9	1.3	1.3
Dates	Production	(1,000 ton)	106.7	81.9	113.0	62.0	97.6	80.0	110.6	85.1	72.6
	Area	(x1,000 ha)	43.7	44.3	44.4	44.5	44.8	45.2	45.4	46.4	46.4
Walnut	Production	(1,000 ton)	0.8	2.0	4.0	1.5	1.7	3.5	3.3	5.0	80.0
	Area	(x1,000 ha)	4.5	4.8	5.0	5.2	7.6	8.0	7.5	5.3	5.3
Fig	Production	(1,000 ton)	60.0	45.0	50.0	650.0	67.0	40.4	51.2	68.0	820.0
	Area	(x1,000 ha)	40.0	40.0	40.0	40.0	45.3	44.0	42.0	44.6	44.5
Citrus fruits	Production	(1,000 ton)	1,468.0	1,110.0	1,230.0	1,324.0	997.0	1,400.0	1,194.0	1,591.0	1,303.0
	Area	(x1,000 ha)	72.7	73.5	74.3	74.8	74.8	74.5	74.6	75.7	75.7
Grapes	Production	(1,000 ton)	259.1	294.5	230.4	281.9	173.8	193.1	242.0	261.7	334.8
	Area	(x1,000 ha)	50.1	49.5	49.8	51.0	49.0	48.4	49.4	49.2	49.5
Avocado	Production	(1,000 ton)	2.5	4.5	5.7	6.8	7.8	8.3	10.3	11.0	11.9
	Area	(x1,000 ha)	0.5	0.6	0.9	1.0	1.0	1.1	1.1	1.2	1.2
Others	Production	(1,000 ton)	28.8	31.5	30.6	32.4	32.4	31.5	33.3	34.2	33.2
	Area	(x1,000 ha)	3.6	3.5	3.4	3.6	3.6	3.7	3.7	3.9	3.9

Source: Direction de la Production Vegetale, Ministere de l'Agriculture, du Developpement Rural et des Peches Maritimes, 2001

Table V2.1.11: Number of Livestocks by Provinces in the Project Area

Province a/	Cows			Sheep	Goat
	Improved	Local	Total		
Zone I					
Al Hoceima	6.9	32.7	39.6	142.5	81.3
Boulemane	0.2	12.3	12.5	511.7	144.9
Chefchaouen	8.1	66.9	75.0	89.2	263.2
El Hajeb	16.9	12.9	29.8	180.9	21.1
Fes	10.0	34.2	44.2	327.9	88.4
Ifra	10.3	18.3	28.6	527.2	63.8
Meknes	8.0	18.7	26.7	124.1	8.4
Kenitra	105.6	139.0	244.6	937.2	20.7
Taounate	2.0	94.0	96.0	308.0	28.3
Taza	7.8	75.8	83.6	748.1	290.9
Zone II					
Ben Slimane	28.3	22.3	50.6	200.9	22.7
Casablanca	40.6	1.9	42.5	100.8	1.3
Khemisset	55.2	75.5	130.7	647.1	131.9
Rabat	21.8	9.1	30.9	103.7	9.4
Zone III					
Azilal	12.6	32.9	45.5	430.9	365.6
Beni Mellal	87.7	18.4	106.1	562.7	69.4
El Jadida	222.5	4.5	227.0	563.7	3.9
El Kalaa	116.7	37.9	154.6	887.8	49.4
Essaouira	0.8	53.6	54.4	511.9	358.3
Khouribga	6.1	32.2	38.3	670.6	50.0
Marrakech	32.4	105.2	137.6	894.8	393.2
Safi	26.4	84.7	111.1	984.0	39.0
Settat	57.7	51.1	108.8	1,020.1	20.7
Zone IV					
Agadir	68.9	70.9	139.8	660.2	521.7
Ouarzazaate	5.4	77.2	82.6	554.0	489.6
Tiznit	4.5	40.2	44.7	179.9	169.9
Zone V					
Er Rachidia	3.1	36.6	39.7	425.3	398.0
Figuig	0.3	7.9	8.2	739.4	137.2
Total	1,118.7	1,441.1	2,559.8	16,576.4	5,114.4

Note: a/ : The data shows only for provinces related to the area of Zone

Source: Elevage en Chiffres, 1999, Service du Suivi et de l'Evaluation Juillet 2000

Table V2.1.12: Meat Production at SVM, DPAs and ORMVAs in 1999

	Cows		Sheep		Goat		Camel		Horse		Big		Total		
	Slaughtered Heads	Meat Production	Meat Production												
	(Head)	(Ton)	(Ton)												
SVM	1999	163,568	33,195	558,183	6,665	4,434	59	500	98	10,122	1,092	3,515	260	41,369	
	1998	213,916	42,789	835,767	12,052	23,111	233	973	140	9,256	1,260	8,011	232	56,706	
	1997	208,601	42,466	835,575	12,498	11,645	122	770	92	9,862	1,463	8,497	557	57,198	
(AM)	DPA	1999	208,761	38,632	954,455	27,062	365,660	3,687	12,242	1,448	274	32		70,861	
	(AM)	1998	150,882	23,836	891,256	12,791	352,286	3,503	12,282	1,420	400	37		41,587	
	(AM)	1997	150,416	23,573	951,328	14,686	382,597	3,765	7,928	1,121	418	39		43,184	
(AR)	DPA	1999	154,494	21,747	703,488	12,551	455,585	4,636	1,491	193				39,127	
	(AR)	1998	133,638	18,960	887,538	12,183	555,380	5,691	1,578	204				37,038	
	(AR)	1997	159,630	22,477	851,888	12,365	420,486	4,336	1,580	213				39,391	
Total	DPA	1999	363,255	60,379	1,657,943	39,613	821,245	8,323	13,733	1,641	274	32	0	109,988	
	Total	1998	284,520	42,796	1,778,794	24,974	907,666	9,194	13,860	1,624	400	37	0	78,625	
	Total	1997	310,046	46,050	1,803,216	27,051	803,083	8,101	9,508	1,334	418	39	0	82,575	
ORMVA	ORMVA	1999	76,592	28,636	284,620	3,822	139,777	1,258	329	39				33,755	
	(AM)	1998	73,082	11,776	353,016	5,067	219,002	2,105	920	141				19,089	
	(AM)	1997	67,095	10,822	332,755	4,815	100,468	994	711	105				16,736	
ORMVA	ORMVA	1999	66,266	9,045	205,316	3,054	135,316	1,380	237	28				13,507	
	(AR)	1998	59,525	8,746	318,084	4,829	217,090	2,356	357	45				15,976	
	(AR)	1997	57,836	8,592	315,653	4,788	142,861	1,165	263	31				14,576	
Total	ORMVA	1999	142,858	37,681	489,936	6,876	275,093	2,638	566	67	0	0	0	47,262	
	Total	1998	132,607	20,522	671,100	9,896	436,092	4,461	1,277	186	0	0	0	35,065	
	Total	1997	124,931	19,414	648,408	9,603	243,329	2,159	974	136	0	0	0	31,312	
(AM)	Total	1999	448,921	100,463	1,797,258	37,549	509,871	5,004	13,071	1,585	10,396	1,124	3,515	145,985	
	(AM)	1998	437,880	78,401	2,080,248	29,910	594,399	5,841	14,175	1,701	9,656	1,297	8,011	232	117,382
	(AM)	1997	426,112	76,861	2,119,658	31,999	494,710	4,881	9,409	1,318	10,280	1,502	8,497	557	117,118
(AR)	Total	1999	220,760	30,792	908,804	15,605	591,901	6,016	1,728	221				52,634	
	(AR)	1998	193,163	27,706	1,205,622	17,012	772,470	8,047	1,935	249				53,014	
	(AR)	1997	217,466	31,069	1,167,541	17,153	563,347	5,501	1,843	244				53,967	
Grand	1999	669,681	131,255	2,706,062	53,154	1,101,772	11,020	14,799	1,806	10,396	1,124	3,515	260	198,619	
Total	1998	631,043	106,107	3,285,870	46,922	1,366,869	13,888	16,110	1,950	9,656	1,297	8,011	232	170,396	
	1997	643,578	107,930	3,287,199	49,152	1,058,057	10,382	11,252	1,562	10,280	1,502	8,497	557	171,085	

Note: SVM: Municipal Veterinary Services
 AM: Slaughtering in Municipalities
 AR: Slaughtering in Farmers

Source: Elevage en Chiffres, 1999, Service du Suivi et de L'Evaluation Juillet 2000

Table V2.1.13: Production of Sugar Processing

	1990	1991	1992	1993	1994	1995	1996	1997	(Ton/year)
Sugar Beet Factory									
SUNAB	205,034	185,429	102,872	139,243	194,060	130,400	117,400		
SUNAG-Ksiri	275,067	259,060	133,238	233,954	288,739	446,115	269,966	491,288	
SUNAG-Tazi	272,348	241,410	138,792	218,231	310,892				
SUNABEL	187,460	226,100	285,380	325,325	370,940	149,256	181,013		
SUBM	333,500	329,865	298,212	262,899	288,767	250,831	293,331		
SUTA	231,798	211,820	163,426	182,200	144,386	173,385	209,789	872,910	
SUNAT	418,854	424,886	317,697	319,723	248,239	300,888	368,547		
DOUKKALA	457,541	484,676	595,100	631,000					
ZEMAMRA	377,304	476,082	558,485	658,000					
SUCRAFOR	139,626	139,450	93,000	90,943	107,275	158,500	208,100	238,000	
Sub-total	2,898,532	2,978,778	2,686,202	3,061,518	1,953,298	1,609,384	1,648,146	1,632,198	
Sugarcane Factory									
SUNACAS	245,699	250,652	299,610	249,241	241,936	251,323	218,164		
SURAC	383,645	383,109	378,718	371,169	383,590	428,507	384,277	726,297	
SUCRAL	333,020	332,576	334,147	276,953	254,928	321,940	267,925		
SUCRAFOR	45,060	59,435	51,270	46,237	22,762	29,493	28,749	17,350	
Sub-total	1,007,424	1,025,772	1,063,745	943,600	903,216	1,031,263	899,115	743,647	
	3,905,956	4,004,550	3,749,947	4,005,118	2,856,514	2,640,647	2,547,261	2,375,845	

Source : Homepage of Ministry of Agriculture, Rural Development and Fisheries

Table V2.1.14: Oil Processing Capacity

Factory	(ton/year)	Factory	(ton/year)
LESIEUR CRYSTAL	190,000	C.M.H	12,000
OLEOR	18,000	Huileries of the Souss	20,000
SEPO	55,000	Huileries of Oujda	20,000
SICO	9,000	SUDEXPORT	6,000
SOMIO	12,000	SIKAF	6,000
Huileries of Meknnes	33,000	SOMATAZI	12,000
SIOF	12,000		
Total Capacity of Oil Processing			317,000

Source : Homepage of Ministry of Agriculture, Rural Development and Fisheries

Table V2.1.16: Production of Milk and Milk Processing

Year	Fresh Milk (10⁶ liter)	Sterilized (10⁶ liter)	Batter (ton)	Cheese (ton)	Powder (ton)
1990	370	325	3,121	7,839	478
1991	390	334	3,242	8,200	1,182
1992	440	383	3,908	8,600	1,408
1993	475	401	4,676	10,000	1,029
1994	490	390	5,600		1,400

Source : Homepage of Ministry of Agriculture, Rural Development and Fisheries

Table V2.1.15: Production and Export of the Olive Oil

Year	Production (ton)	Export (ton)
1991	55,000	2,000
1992	38,000	4,500
1993	40,000	400
1994	45,000	0
1995	35,000	6,450
1996	80,000	14,160
1997	50,000	33,700

Source : Homepage of Ministry of Agriculture, Rural Development and Fisheries

**Table V2.1.17: Processing Capacity of Milling by Economic Region
(Unit: ton)**

Economic	No. of	Processing
Centre	21	123,000
Nord Ouest	17	68,100
Centre Nord	17	65,550
Tensift	11	50,700
Cebtre Sud	9	35,700
Oriental	7	29,700
Sud	6	27,500
	88	400,250

Source : Homepage of Ministry of Agriculture, Rural Development and Fisheries

Table V2.1.18: Import and Export of Agricultural Commodities in Morocco

Items	Import Amount (Million ton)					Items	Import Value (million DH)				
	1994	1995	1996	1997	1998		1994	1995	1996	1997	1998
Milk Products	46	45	42	33	35	Milk Products	759	814	730	538	644
Seedling Potatoes	51	54	111	38	39	Seedling Potatoes	190	311	111	112	137
Coffee	22	20	23	27	28	Coffee	349	514	383	433	479
Tea	34	38	28	35	51	Tea	681	695	501	655	749
Wheat	1,191	2,549	2,240	2,055	2,581	Wheat	1,491	3,997	4,137	3,486	3,728
Sugar	455	478	513	586	562	Sugar	1,164	1,320	1,349	1,521	1,490
Tobacco	13	9	14	10	9	Tobacco	828	509	577	565	619
Other	624	1,615	944	1,109	2,029	Other	1,886	3,470	3,435	2,839	3,547
Total	2,436	4,808	3,915	3,893	5,334	Total	7,348	11,630	11,223	10,149	11,393

Items	Export Amount (Million ton)					Items	Export Value (million DH)				
	1994	1995	1996	1997	1998		1994	1995	1996	1997	1998
Fishes	32	29	30	35	30	Fishes	742	763	811	969	835
Shell Fish	112	111	98	91	108	Shell Fish	3,521	4,310	4,110	3,843	3,940
Fresh Freezeded Veg	30	25	25	39	46	Fresh Freezeded Veg	359	394	332	451	380
Fresh Tomato	151	156	153	189	207	Fresh Tomato	404	612	719	865	1,020
Potatoes	87	97	53	50	30	Potatoes	245	415	224	181	125
Dried Vegetables	7	6	5	11	21	Dried Vegetables	40	58	49	77	131
Citrus	499	414	632	516	632	Citrus	1,384	1,716	2,700	2,377	2,725
Canned Fish	59	68	61	61	64	Canned Fish	1,440	1,542	1,535	1,664	1,829
Canned Vegetables	65	83	78	91	64	Canned Vegetables	845	1,098	1,167	1,223	929
Caned Fruits / Jerry	15	18	16	14	20	Caned Fruits / Jerry	133	210	179	174	213
Other	253	215	178	162	208	Other	1,290	1,275	1,253	1,266	1,575
Total	1,310	1,222	1,329	1,259	1,430	Total	10,403	12,393	13,079	13,090	13,702

Source: Annuaire Statistique de Maroc 1999, Direction de la Statistique, Ministere de la Prevision Economique et de Plan

**Table V2.1.19: Standard of Input Requirement for Crop Production
Under the Condition of "With Project"**

	Unit	Cereals	Corn Grain	Sugar beat	Potato	Carrot	Tomato	Water Melon	Pepper	Green beans	Legumes green	Alfalfa	Bersim	Summer fodder	Apple
Seed	kg/ha	120	30	15	2000	3	0.5	3	0.5	60	100	360 DH b/	25	80	-
Manure	ton/ha	10 e/	20	-	30	10	30	-	20	20	15	-	-	-	-
Fertilizer															
N	kg/ha	120	90	80	90	105	92	210	120	33	21	46	32	100	180
P2O5	kg/ha	84	45	65	90	135	90	210	140	110	70	135	70	70	250
K2O	kg/ha	90	90	150	170	150	120	150	100	150	95	100	100	110	135
Agricultural Chemicals	DH/ha	50	50	-	200	100	600	600	400	200	100	-	-	-	600
Mechanization															
Tractor c/	hr/ha	12 / 6.5	- / 6.5	- / 9.5	- / 12.5	- / 12.5	- / 9.5	- / 9.5	- / 9.5	- / 9.5	- / 9.5	- / -	- / 7.5	- / 6.5	- / 4.5
Animal Traction c/	day/ha	2 / 5	- / 8	- / 6	- / 19	- / 19	- / 38	- / 38	- / 21	- / 21	- / 20	- / 18	- / 12	- / 8	- / 10
Baler	hr/ha	- / 4	-	-	-	-	-	-	-	-	-	-	-	-	-
Harvester	hr/ha	2 / -	-	-	-	-	-	-	-	-	-	-	-	-	-
Labor Force	day/ha	10 / 23	- / 55	- / 120	- / 120	- / 120	- / 200	- / 155	- / 117	- / 194	- / 71	- / 144	- / 66	- / 35	- / 140
Other (bags, case, etc) d/	%	10	10	10	15	15	20	15	15	15	15	10	10	10	20

Note: a/ Fodder is taken as an basis for counting

b/ Installation costs seedlings (25kg), Manure (20t); Soil preparation and sowing is 1,450DH/4years = 360DH/ha/year

c/ Mechanized / semi-mechanized; mechanized>5ha; semi-mechanized <5ha

d/ In % of production costs not including labor

e/ Recommendation from the Study Team

Source: The Development of Small and Medium Scale Irrigation Project

Collected data from Rural Engineering Administration, Ministry of Agriculture, Rural Development and Fisheries

Table V2.1.20: Labor Cost in ORMVAs (DH/day)

ORMVA	Gharb	Loukkos	Doukkala	Haouz	Souss-Massa	Talda	Moulouya	Average
Plowing	40			39	40	50	50	43.8
Cover cropping	36	30		44	49	50	47	42.7
Light hallow	39		40		39	34	50	40.4
Seeding	30	29	41	39	39	35	49	37.4
Planting	30	25	34	35	38	34	50	35.1
Soil fertilization	32	32	41	38	40	36	49	38.3
Surface fertilization	31	30	38	37	39	34	48	36.7
Treatment	35	30	41	41	39	34	49	38.4
Weeding	33	37	39	40	38	34	48	38.4
Ridging	33		31	41	40	70	47	43.7
Covering	28	33	40	38	40	35	49	37.6
Harrowing	29	28	35	40	39	33	48	36.0
Clearing out	23		37	56	35	32	50	38.8
Harvest	29			75		55		53.0
Threshing	25			69	47	51	50	48.4
Baling	30	33	47	55	41	35	51	41.7
Harvest / Threshing	31	34	49	65	43	39	52	44.7
Harvest / Threshing	42	38	58	53			58	49.8
Average	32	32	41	47	40	41	50	41.4

Source: Enquête budget de Ferme dans les Zones d'intervention des ORMVA, DPAE/AGR Bebruary 1998

Table V2.1.21: Unit Operating Cost in ORMVAs (DH/ha)

ORMVA	Gharb	Loukkos	Doukkala	Haouz	Souss-Massa	Talda	Moulouya	Average
Plowing	287	267	304	324	405	321	319	318.1
Cover cropping	135	176	166	146	123	131	148	146.4
Raking		203	200					201.5
Hallowing	140	113	145			109	151	131.6
Seeding	110	105	202	168	95		249	154.8
Ridging	111	163	219	91	147	119	171	145.9
Earthing up	178	324						251.0
Harrowing	92							92.0
Deep fertilization	67		197	60	108		135	113.4
Shallow fertilization	80		171		36		120	101.8
Weeding	59		50		110		117	84.0
Chemical treatment	86	148	131	241	117		132	142.5

Source: Enquête budget de Ferme dans les Zones d'intervention des ORMVA, DPAE/AGR Bebruary 1998

Table V2.1.22: Unit Price of Fertilizer in ORMVAs (DH/100kg)

ORMVA	Gharb	Loukkos	Doukkala	Haouz	Souss-Massa	Talda	Moulouya	Average
14-28-14	251	253	244	262	256	247	257	252.9
Urea	269	282	277	254	280	269	272	271.9
TSP	288		180	194	219	214	226	220.2
Potassium Sulphate	270		255	246	271	252	221	252.5
ASP (19-38-0)	265		250	240	288		291	266.8
Single Super Phosphate	239	260			200			233.0
12-26-13	98		138	80	122		108	109.2
Ammonium Nitrate	202	191	199	202	201	208	206	201.3
Di-ammonium sulphate	140	142	141	185	149	179	158	156.3
Manure	7	16	14	11	29	7	14	14.0

Source: Enquête budget de Ferme dans les Zones d'intervention des ORMVA, DPAE/AGR Bebruary 1998

Table V2.2.1: Condition of Farm Land and Irrigation of Commune Rurals in the 25 Candidate Project Areas

Candidate Project	Farm Land				Irrigation/Non-irrigation		
	Farmer (No.)	Farm Area (ha)	Farm Plot (No.)	Average Farm Size (ha/farmer)	Irrigation (ha)	Rainfed (ha)	Irrigation (%)
Zone I							
1 Neckor	837	5,994	16,335	7.2	590	5,404	9.8
2 Tizimellal	63	453	579	7.2	2	451	0.4
6 Tazarane	4,120	11,758	26,394	2.9	940	10,818	8.0
14 Adarouch	2,542	25,337	15,730	10.0	5,193	20,144	20.5
17 Azghar	2,393	10,602	15,291	4.4	648	9,954	6.1
19 Aoukai	1,566	4,847	11,125	3.1	14	4,833	0.3
20 Sidi Abbou	2,120	16,680	20,115	7.9	491	16,189	2.9
21 Sidi El Mokhfi	4,332	13,355	23,030	3.1	105	13,250	0.8
Zone II							
4 Ain Kwachiya	1,287	15,926	4,045	12.4	883	15,043	5.5
5(1) N'Fiiikh (Downstream)	358	3,979	758	11.1	216	3,763	5.4
5(2) N'Fiiikh (Upstream)	2,648	22,534	10,203	8.5	582	21,952	2.6
15 Sidi Omar	795	6,459	2,512	8.1	358	6,101	5.5
18 Boukatkaour	3,222	26,663	13,367	8.3	175	26,488	0.7
Zone III							
3 Ait Baddou	2,868	10,890	19,556	3.8	427	10,463	3.9
7 Amez Miz	1,989	11,213	10,672	5.6	5,178	6,035	46.2
8 Boulaouane	1,429	6,975	8,136	4.9	4,064	2,911	58.3
9 Taskourt	5,536	54,984	27,274	9.9	17,436	37,548	31.7
22 N'Ountz	1,698	14,042	9,135	8.3	1,551	12,491	11.0
Zone IV							
16 Tiwine	1,518	2,048	15,415	1.3	1,813	235	88.5
23 Iguin' Quaqa	2,943	15,161	12,860	5.2	7,561	7,600	49.9
24 Amont Abdel Moumen	1,133	1,360	4,947	1.2	339	1,021	24.9
25 Sidi Abdellah	2,366	9,897	8,107	4.2	5,953	3,944	60.1
Zone V							
10 Timkit	4,786	4,997	38,897	1.0	3,984	1,013	79.7
11 Tadighoust	3,629	2,471	24,377	0.7	2,232	239	90.3
12 Tiouzaguirne	1,390	2,359	7,493	1.7	1,283	1,076	54.4
13 Kheng Grou	925	4,756	7,338	5.1	1,265	3,491	26.6

Source: Recensement General de l'Agriculture, Resultsts par Commune,
Ministere de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

Table V2.2.2: Land Tenure of Operating Farm Lands of Commune Rurals in the 25 Candidate Project Areas

Candidate Project	Operating Farm Area (ha)						
	Owner (No.)	Owner (%)	Tenant (No.)	Tenant (%)	Loan & work (No.)	Loan & work (%)	Total
Zone I							
1 Neckor	4,506	75.2	27	0.5	1,461	24.4	5,994
2 Tizimellal	405	89.4	0	0.0	48	10.6	453
6 Tazarane	11,371	96.7	297	2.5	90	0.8	11,758
14 Adarouch	27,665	91.9	764	2.5	1,664	5.5	30,093
17 Azghar	9,942	93.8	30	0.3	630	5.9	10,602
19 Aoukai	4,576	94.4	68	1.4	203	4.2	4,847
20 Sidi Abbou	13,799	82.7	872	5.2	2,009	12.0	16,680
21 Sidi El Mokhfi	12,925	96.8	64	0.5	366	2.7	13,355
Zone II							
4 Ain Kwachiya	14,537	91.3	1,247	7.8	142	0.9	15,926
5(1) N'Fiiikh (Downstream)	3,264	82.0	203	5.1	152	3.8	3,979
5(2) N'Fiiikh (Upstream)	20,006	88.8	1,079	4.8	1,449	6.4	22,534
15 Sidi Omar	5,658	87.6	44	0.7	757	11.7	6,459
18 Boukatkaour	23,465	88.0	994	3.7	2,204	8.3	26,663
Zone III							
3 Ait Baddou	10,069	92.5	178	1.6	643	5.9	10,890
7 Amez Miz	9,580	85.4	195	1.7	1,438	12.8	11,213
8 Boulaouane	5,471	78.4	67	1.0	1,437	20.6	6,975
9 Taskourt	48,805	88.8	204	0.4	5,975	10.9	54,984
22 N'Ountz	13,646	97.1	2	0.0	394	2.8	14,052
Zone IV							
16 Tiwine	1,839	89.8	106	5.2	103	5.0	2,048
23 Iguin' Quaqa	14,489	95.6	303	2.0	369	2.4	15,161
24 Amont Abdel Moumen	1,359	99.9	0	0.0	1	0.1	1,360
25 Sidi Abdellah	9,385	94.8	496	5.0	16	0.2	9,897
Zone V							
10 Timkit	4,801	96.1	46	0.9	150	3.0	4,997
11 Tadighoust	2,244	90.8	112	4.5	115	4.7	2,471
12 Tiouzaguirne	2,212	93.8	34	1.4	111	4.7	2,359
13 Kheng Grou	4,735	99.6	19	0.4	2	0.0	4,756

Source: Recensement General de l'Agriculture, Resultsts par Commune,
Ministere de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

Table V2.2.3: Land Ownership of Commune Rurals in the 25 Candidate Project Areas

Candidate Project	Farm land (ha)					
	Private	Group	Habous	Guich	Estate farm	Total
Zone I						
1 Neckor	5,966	1	27	0	0	5,994
2 Tizimellal	453	0	0	0	0	453
6 Tazarane	11,734	0	20	4	0	11,758
14 Adarouch	27,336	2,493	6	27	231	30,093
17 Azghar	10,517	0	68	0	17	10,602
19 Aoukai	4,758	14	75	0	0	4,847
20 Sidi Abbou	16,007	73	51	4	545	16,680
21 Sidi El Mokhfi	13,053	285	17	0	0	13,355
Zone II						
4 Ain Kwachiya	14,663	42	0	0	1,221	15,926
5(1) N'Fiiikh (Downstream)	3,626	0	0	0	353	3,979
5(2) N'Fiiikh (Upstream)	20,971	331	25	0	1,207	22,534
15 Sidi Omar	6,389	68	0	0	2	6,459
18 Boukatkaour	26,535	32	0	0	96	26,663
Zone III						
3 Ait Baddou	10,541	1	9	1	338	10,890
7 Amezmirz	5,892	5,280	32	0	9	11,213
8 Boulaouane	6,617	168	0	0	190	6,975
9 Taskourt	15,890	25,704	895	12,487	8	54,984
22 N'Ountz	14,042	0	0	0	0	14,042
Zone IV						
16 Tiwine	1,943	0	63	1	41	2,048
23 Iguin' Quaqa	11,381	537	45	0	3,198	15,161
24 Amont Abdel Moumen	542	2	0	0	816	1,360
25 Sidi Abdellah	7,042	1,024	21	0	1,810	9,897
Zone V						
10 Timkit	3,106	75	14	0	0	4,997
11 Tadighoust	2,374	13	84	0	0	2,471
12 Tiouzaguiine	2,320	0	39	0	0	2,359
13 Kheng Grou	3,988	768	0	0	0	4,756

Source: Recensement General de l'Agriculture, Resultsts par Commune,
Ministere de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

Table V2.2.4: Utilization of Agricultural Machineries of Commune Rurals in the 25 Candidate Project Areas

Candidate Project	Number of machineries		
	Tractor	Harvester	Pump
Zone I			
1 Neckor	0	0	2
2 Tizimellal	15	1	105
6 Tazarane	114	2	72
14 Adarouch	35	4	75
17 Azghar	2	1	3
19 Aoukai	47	11	163
20 Sidi Abbou	9	2	14
21 Sidi El Mokhfi			
Zone II			
4 Ain Kwachiya	248	17	425
5(1) N'Fiiikh (Downstream)	35	2	130
5(2) N'Fiiikh (Upstream)	161	14	366
15 Sidi Omar	30	5	90
18 Boukatkaour	181	44	137
Zone III			
3 Ait Baddou	12	5	55
7 Amezmirz	25	2	43
8 Boulaouane	2	0	3
9 Taskourt	82	1	282
22 N'Ountz	17	0	96
Zone IV			
16 Tiwine	6	0	103
23 Iguin' Quaqa	213	6	413
24 Amont Abdel Moumen	0	0	13
25 Sidi Abdellah	119	8	270
Zone V			
10 Timkit	44	0	1,534
11 Tadighoust	10	0	169
12 Tiouzaguiine	2	0	8
13 Kheng Grou	10	1	117

Source: Recensement General de l'Agriculture, Resultsts par Commune,
Ministere de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

Table V2.2.5: Cultivated Area of Commune Rurals in the 25 Candidate Project Areas

Candidate Project	Cultivated Area								
	Cereals	Legume s	Vegetable	Oil Plant	Industrial cultivation	Fodder	Fruits	Fallow	Total
Zone I									
1 Neckor									
2 Tizimellal	309	13	2	0	0	0	64	113	501
6 Tazarane	3,387	355	104	2	5,101	375	1,723	1,305	12,352
14 Adarouch	13,709	228	469	0	0	1,438	1,309	8,214	25,367
17 Azghar	7,009	666	92	0	0	48	1,807	2,007	11,629
19 Aoukai	2,268	151	18	2	409	67	1,898	600	5,413
20 Sidi Abbou	12,623	1,614	285	0	8	186	2,067	1,176	17,959
21 Sidi El Mokhfi	6,192	1,060	200	2	0	19	6,714	1,571	15,758
Zone II									
4 Ain Kwachiya	9,100	59	263	7	2	2,798	1,188	2,573	15,990
5(1) N'Fiiikh (Downstream)	2,771	24	181	0	1	117	210	935	4,239
5(2) N'Fiiikh (Upstream)	19,031	1,034	436	0	1	881	878	2,036	24,297
15 Sidi Omar	4,882	182	204	0	0	27	286	903	6,484
18 Boukatkaour	21,518	3,198	923	0	0	76	101	2,107	27,923
Zone III									
3 Ait Baddou	9,666	137	76	7	0	101	2,060	768	12,815
7 Amezmirz	9,719	74	195	1	1	214	1,488	524	12,216
8 Boulaouane	6,726	16	57	0	0	51	1,545	48	8,443
9 Taskourt	50,015	186	619	0	33	328	3,893	2,186	57,260
22 N'Ountz	8,222	7	195	0	0	132	336	5,217	14,109
Zone IV									
16 Tiwine	1,569	41	116	0	0	394	342	176	2,638
23 Iguin' Quaqa	10,629	41	1,039	0	1	571	3,103	635	16,019
24 Amont Abdel Moumen	1,362	0	7	0	0	1	211	29	1,610
25 Sidi Abdellah	6,031	0	757	0	1	607	2,346	574	10,316
Zone V									
10 Timkit	3,402	74	205	0	88	594	1,330	797	6,490
11 Tadighoust	1,765	46	19	0	0	621	1,102	183	3,736
12 Tiouzaguiine	2,070	35	26	0	0	153	172	231	2,687
13 Kheng Grou	2,061	41	44	0	0	88	516	2,122	4,872

Source: Recensement General de l'Agriculture, Resultsts par Commune,
Ministere de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

Table V2.2.6: Number of Livestock of Commune Rurals in the 25 Candidate Project Areas

Candidate Project	Table Animal (Meat Production)				Draft Animal		
	Cattle	Sheep	Goat	Camel	Horse	Mule	Donkey
Zone I							
1 Neckor	739	3,886	253	0	0	644	438
2 Tizimellal	44	202	11	0	0	26	38
6 Tazarane	5,341	5,301	13,705	0	1	4,982	205
14 Adarouch	3,754	120,058	9,894	61	1,153	2,215	1,763
17 Azghar	3,077	27,832	18,340	7	77	2,213	1,128
19 Aoukai	3,274	5,444	7,082	0	7	1,703	517
20 Sidi Abbou	3,922	19,861	499	6	375	1,561	1,873
21 Sidi El Mokhfi	6,493	14,111	3,966	0	32	2,233	2,075
Zone II							
4 Ain Kwachiya	4,793	30,652	4,944	9	310	124	805
5(1) N'Fiiikh (Downstream)	1,016	8,228	172	21	26	19	145
5(2) N'Fiiikh (Upstream)	6,763	22,523	1,486	50	503	812	2,109
15 Sidi Omar	972	4,980	1,704	0	139	225	338
18 Boukatkaour	6,218	31,783	8,400	5	584	865	2,913
Zone III							
3 Ait Baddou	2,181	22,446	15,125	85	170	1,106	2,498
7 Amezmirz	3,314	25,012	4,065	0	36	238	2,051
8 Boulaouane	2,730	21,567	9,819	0	53	463	1,413
9 Taskourt	8,608	93,717	15,213	14	109	650	5,408
22 N'Ountz	1,346	22,940	16,022	57	182	1,790	879
Zone IV							
16 Tiwine	2,337	11,645	11,377	5	1	367	829
23 Iguin' Quaqa	6,702	29,368	22,616	0	36	413	2,786
24 Amont Abdel Moumen	1,036	2,405	14,682	0	0	319	657
25 Sidi Abdellah	5,070	19,975	10,627	0	28	323	1,518
Zone V							
10 Timkit	4,293	35,551	38,361	480	2	703	1,641
11 Tadighoust	3,397	23,907	16,760	531	2	220	2,025
12 Tiouzaguiine	686	38,979	52,419	52	7	794	2,313
13 Kheng Grou	561	14,411	12,226	31	35	235	805

Source: Recensement General de l'Agriculture, Resultsts par Commune,
Ministere de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

Table V2.2.7: Non-agricultural businesses of farmers of Commune Rurals in the 25 Candidate Project Areas

Candidate Project	Farmin g only	Non-agricultural activities of farmers								
		Fishing	Energy / Industry	Const- ruction	Handy craft	Services	Officer	Private business	Others	(Sub- total)
Zone I										
1 Neckor	764	0	0	7	2	23	13	1	26	72
2 Tizimellal	31	0	0	11	0	7	2	2	8	30
6 Tazarane	3,778	2	0	0	28	87	50	38	134	339
14 Adarouch	2,174	5	3	0	3	68	104	16	169	368
17 Azghar	2,115	3	3	2	0	30	147	11	78	274
19 Aoukai	1,273	1	1	1	2	50	80	0	157	292
20 Sidi Abbou	1,801	0	0	3	5	99	39	0	156	302
21 Sidi El Mokhfi	3,729	2	3	2	54	98	124	79	236	598
Zone II										
4 Ain Kwachiya	953	1	6	0	3	65	161	27	65	328
5(1) N'Fiikh (Downstream)	236	6	9	1	0	14	16	5	65	116
5(2) N'Fiikh (Upstream)	2,128	5	20	6	7	138	97	40	177	490
15 Sidi Omar	519	0	0	0	0	17	147	55	46	265
18 Boukatkaour	2,664	1	16	0	5	122	106	34	274	558
Zone III										
3 Ait Baddou	2,308	2	2	6	10	68	63	8	400	559
7 Amez Miz	1,663	1	5	14	6	36	53	101	107	323
8 Boulaouane	1,293	2	1	1	2	14	9	26	80	135
9 Taskourt	4,760	3	9	53	59	205	75	83	288	775
22 N'Ountz	1,572	2	13	0	3	49	12	8	39	126
Zone IV										
16 Twine	1,112	1	14	67	1	49	59	1	213	405
23 Iguin' Quaqa	2,539	1	11	15	13	132	43	5	183	403
24 Amont Abdel Moumen	871	2	11	3	11	62	18	2	151	260
25 Sidi Abdellah	1,991	0	8	17	7	60	53	1	215	361
Zone V										
10 Timkit	3,505	1	17	510	11	127	123	189	289	1,267
11 Tadighoust	2,498	0	4	366	18	101	241	151	247	1,128
12 Tiouzaguiine	1,260	0	0	0	0	1	17	1	111	130
13 Kheng Grou	708	0	1	4	15	28	44	38	86	216

Source: Recensement General de l'Agriculture, Resultsts par Commune,
Ministere de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

Table V2.2.8: Educational background of farmers of Commune Rurals in the 25 Candidate Project Areas

Candidate Project	Illiteracy	Religious school	Primary school	Secondary school	High school	University	Total
			(5-7age)	(7-12age)	(12-15age)	(15-18age)	
Zone I							
1 Neckor	687	77	53	16	0	3	836
2 Tizimellal	37	6	14	2	2	0	61
6 Tazarane	2,824	1,105	118	35	24	8	4,117
14 Adarouch	2,168	58	148	64	56	48	2,542
17 Azghar	2,006	201	105	42	16	19	2,389
19 Aoukai	1,124	285	103	30	16	7	1,556
20 Sidi Abbou	1,757	150	132	37	21	6	2,103
21 Sidi El Mokhfi	3,558	346	287	69	39	28	4,327
Zone II							
4 Ain Kwachiya	853	71	116	45	72	124	1,281
5(1) N'Fiikh (Downstream)	266	14	28	18	10	16	352
5(2) N'Fiikh (Upstream)	2,073	131	187	71	56	100	2,618
15 Sidi Omar	619	64	38	23	28	12	784
18 Boukatkaour	2,648	188	173	94	76	43	3,222
Zone III							
3 Ait Baddou	2,237	397	169	36	20	8	2,867
7 Amez Miz	1,529	241	149	37	15	15	1,986
8 Boulaouane	1,263	98	50	9	5	3	1,428
9 Taskourt	4,682	509	261	40	21	22	5,535
22 N'Ountz	1,563	59	42	21	9	4	1,698
Zone IV							
16 Twine	1,126	158	188	22	17	6	1,517
23 Iguin' Quaqa	2,421	210	226	44	16	25	2,942
24 Amont Abdel Moumen	1,007	35	65	5	9	10	1,131
25 Sidi Abdellah	1,936	163	181	33	22	17	2,269
Zone V							
10 Timkit	3,225	552	786	115	60	44	4,782
11 Tadighoust	2,207	488	660	138	86	50	3,629
12 Tiouzaguiine	1,258	22	89	7	8	6	1,390
13 Kheng Grou	681	66	118	25	20	14	924

Source: Recensement General de l'Agriculture, Resultsts par Commune,
Ministere de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

Table V3.2.1: Chronology of Extension Related Reforms and Developments

Year	Reforms and Developments
First Period 1957-1969	
1957	Starting of 1st plough operation from 150,000 ha to 1,000,000ha
1957	Transformation of "Peasantry" to "Agricultural Centers" and "Work Centers"
1960	Operation of the "National Office for Irrigation (ONI)"
1960	The Plan 1960-1964: Extension had the responsibility of introducing new technique to farmers. The state had to make sure that the farmer "knows, can and wants"
1961	Reorganization of agricultural credit system, creation of CNCA
1962	Creation of ONMR to improve nonirrigated areas
1962	Opening of the 1st sugar beets campaign under the supervision of ONI
1965	The Plan 1965-67: Extension was assigned to train farmers with modern production technique
1965	Starting of fertilizers operation
1966	OMVA becomes ORMVA
1966	Creation of the directorate of development regrouping the services of ONI
1967	Establishment of 75 local officers of CNCA
1968	The Plan 1968-72: the extension sector was assigned to organize the profession by creating cooperatives and encourage farmers to intensify agricultural activities and to make the state investments profitable and to insure a permanent dialogue between the state and the farmers
1968	Establishment of Hassan Institute of Agronomy and Veterinary Studies
1969	provisions of agricultural code of investments in nonirrigated areas
1969	Establishment of farms for young farmers (FEJA)
Second Period (1972-1985)	
1972	Establishment of national council for agricultural reform
1972	Establishment of national council for extension
1973	1973-1977: Use of accounting
1973	Reorganization of cereal markets and control of mills
1975	Increment of agricultural machineries (2,206 tractors compared to 1,700 in 1973)
1975	Creation of DPA
1978	Creation of the National Center for Studies and Research of Extension (CNERV)
1978	Plan 1978-80: Training to the farmers to make the intervention of the state more efficient
1980	Introduction of Feminine extension
1980	Establishment of Directorate of Extension and Agricultural Reform
1981	Plan 1981-85: Objectives of extension: Improving agricultural productivity and develop within the peasantry a qualitative change making the farmer willing to technical and economic progress
1981	Establishment of the National Institute for Agronomical Research (INRA)
1983	Introduction of T&V method in extension
Third Period 1986-1995	
1986	Reinforcement of T&V and creation of Pilot Work Centers
1986	Creation of multidisciplinary teams at the level of DPA
1986	Instruction No. 14/DVRA presenting the general framework of Work Centers
1986	Creation of DSVP within the national school of agriculture
1987	International Conference of Extension in National School of Agriculture, Meknes
1989	Starting the Project: Research/Extension financed by IBRD over 5 years. Its objective is technology transfer and development of specifications in favour of the rural women
1989	Note No. 1670/89 in relation with the orientation and functioning of Regional Centers for Agricultural Development
1991	Note No. 5195/91: Attributions of the Central Animation Team
1991	Program research/Agricultural Development between INRA and DVRA
1993	Creation of DERD. Its' mission is Education, Research and Development
1994	Creation of the national committee for the transfer of technology
1995	Instruction No. 6: Organisation of DPAS

Source: Ministere de l'Agriculture et de la Mise en valeur Agricole, Direction de la Recherche et du Developpement, Division de la Vulgarisation Agricole; Propositions d'Orientations Pour Une Nouvelle Strategie de la Vulgarisation au Maroc; Comite de Pilotage de la Strategie de la Vulgarisation; 1995

Table V3.3.1: Rural/Agricultural Development Projects Comprising Extension Services (1979-2001)

Name of the Project	Duration
- Integrated Agriculture Development Project Fes-Karia-Tissa	1979-90
- Arid Area Agricultural Development Project	1982-94
- Peace Corps Assisted Small Scale Projects	1983-93
- Central Haouz Irrigation Development Project	1984-93
- Integrated Agriculture Development Project Oulmes-Rommani	1984-92
- D'Abda Plain Integrated Agriculture Development Project	1987-94
- Project Assistance to Set-up a Program of Initial Training and Follow-up Extension Pedagogy	1987-95
- Sheep and Cattle Improvement Project in Timhadit and Oulmes	1988-94
- Cattle Raising and Animal Health Project	1988-99
- Establishment of Experimental Center for Agricultural Materials	1989-97
- Second Phase of Small and Medium Hydraulique Project (PMH II)	1989-94
- Project for Practical Training in Agriculture	1989-95
- Intensification Project of Soft Wheat in Meknes	1987-90
- Olive Sector Development Project	1989-95
- Agricultural Extension Project (PRVA)	1989-95
- Technology Transfer Project	1989-94
- Forestry Development Project Second Phase	1990-96
- Pastoral and Cattle Development Project in the East Areas	1990-99
- Agricultural Development Project in Wilaya of Meknes (PIDAM)	1990-99
- Agricultural Employment Oriented Training Project	1991-94
- High Atlas Mountain Area Development Project	1991-97
- Rural Development Project of the Rif	1991-94
- Had-Kourt Quezzane Integrated Agriculture Development Project	1991-94
- Mountain Area Goat Milk Production Improvement Project	1991-93
- Bean Production Improvement Project	1992-94
- Goat Improvement Project in Chefchaouen	1992-95
- FAO Assisted Rural Area Agriculture Development Project	1992-94
- Introduction of Nutrition in Agricultural Extension Project	1992-95
- Local Development Project for Lower and Mid Mountains	1992-94
- Rural Area Basic Services Project	1992-96
- Second Phase of Grand Irrigation Project (PAGI II)	1993-98
- Integration of Population-Education in Agricultural Extension Project	1993-96
- Tafilalet and Dades Valley Rural Development Project	1993-99
- Agricultural Development Backup Project (PSDA)	1994-98
- Occidental Rif Mountain Area Development Project	1995-001

Table V3.7.1 Quantity of Soft Wheat Collected by Different Sources(1986-1998)

Year	Cooperatives	%	Traders	%	Mills	%	(In QX)
							Total
1986	4,647,000	50.4	4,576,000	49.6			9,223,000
1987	2,221,000	41.1	3,183,000	58.9			5,404,000
1988	4,284,000	46.0	5,029,000	54.0			9,313,000
1989	3,926,000	38.7	6,222,000	61.3			10,148,000
1991	4,151,000	38.0	6,785,000	62.0			10,936,000
1994	6,269,000	37.3	8,571,000	51.0	1,980,000	11.8	16,820,000
1996	3,694,000	21.4	8,276,000	48.0	5,278,000	30.6	17,248,000
1998	1,769,000	20.2	5,182,000	59.3	1,794,000	20.5	8,745,000

(until July 31st)

Source: Ministry of Agriculture, Rural Development and Fisheries

Table V3.7.2: Production, Import and Consumption of Fertilisers (1995/96-1998/99)

Type of Fertiliser	1995/96	%	1996/97	%	1997/98	%	1998/99	%
Imports								
Sul. Amm (21%)	79,007	11.8	64,583	10.1	70,147	9.1	78,701	10.2
Ammo. (33.5%)	122,348	18.2	107,595	16.8	144,621	18.8	163,485	21.2
Urea (46%)	114,592	17.1	73,132	11.4	151,170	19.7	143,900	18.7
KCL (60%)	2,037	0.3	1,750	0.3	2,550	0.3	1,728	0.2
Sul. Pot (50%)	29,563	4.4	27,859	4.4	29,548	3.8	30,336	3.9
Total Imports	347,547	51.8	274,919	43.0	398,036	51.8	418,150	54.3
Local Production								
TSP 46%	12,106	1.8	13,657	2.1	11,792	1.5	13,471	1.8
ASP (19-38-0)	24,692	3.7	26,250	4.1	32,632	4.2	27,315	3.5
14-28-14	160,967	24.0	201,725	31.5	214,024	27.9	169,186	22.0
MAP (11-55-0)	2,164	0.3	2,786	0.4	3,312	0.4	8,273	1.1
DAP (18-46-0)	2,729	0.4	3,963	0.6	4,015	0.5	14,323	1.9
SSP (18%)	58,279	8.7	55,528	8.7	62,426	8.1	51,334	6.7
Others	63,035	9.4	60,668	9.5	42,034	5.5	67,554	8.8
Total Local Proudction	323,972	48.2	364,577	57.0	370,235	48.2	351,456	45.7
Local Production +Irrigation	671,519	100.0	639,496	100.0	768,271	100.0	769,606	100.0
N	144,451	51.6	123,544	45.0	173,868	53.0	176,466	54.3
P	78,586	28.1	97,548	35.6	100,946	30.8	97,704	30.1
KCL (60%)	57,111	20.4	53,225	19.4	52,992	16.2	50,700	15.6
Total UF	280,148	100.0	274,137	100.0	327,806	100.0	324,870	100.0

Source: FERTIMA

Table V3.7.3: Sales of Major Cereal Seeds (1990/91-1998/99)

Agricultural Year	Hard Quality Wheat (Ble Dur)	Change (%)	Soft Quality What (Ble Tendre)	Change (%)	Barley (Orge)	Change (%)	Total	Change (%)
1990/91	263,688	-	521,240	-	59,133	-	844,061	-
1991/92	196,460	-25	370079	-29	10926	-82	577465	-32
1992/93	170,355	-13	343796	-7	9800	-10	523951	-9
1993/94	218,100	28	448500	30	52600	437	719200	37
1994/95	161,825	-26	325224	-27	4899	-91	491948	-32
1995/96	270,265	67	425037	31	18685	281	713987	45
1996/97	127,000	-53	294100	-31	6225	-67	427325	-40
1997/98	180,413	42	388961	32	11652	87	581026	36
1998/99	135,763	-25	373000	-4	13674	17	522437	-10

Source: Ministry of Agriculture, Rural Development and Fisheries, 2000

Table V3.7.4: Farmgate Prices of Agricultural Commodities (1995/96-97/98) (1/5)

Provinces	(In DH/KG)											
	Hard Wheat			Soft Wheat			Barley			Maize		
	1995/96	96/97	97/98	1995/96	96/97	97/98	1995/96	96/97	97/98	1995/96	96/97	97/98
Agadir	2.62	-	2.75	2.88	3.00	2.57	1.82	-	2.06	2.77	-	2.45
Al Hoceima	3.17	2.96	3.26	2.96	2.47	3.12	1.66	1.66	2.09	-	1.95	3.08
Azilal	2.60	2.67	3.05	2.25	2.30	2.62	1.26	1.57	1.84	2.45	2.41	2.38
Ben Slimane	2.45	2.68	2.50	2.28	2.36	2.32	1.21	1.80	1.62	2.63	1.90	2.11
Beni Mellal	2.51	2.64	2.93	2.31	2.44	2.50	1.47	1.56	2.03	2.25	1.78	1.86
Boulemane	2.87	3.73	3.07	2.28	3.60	2.85	1.41	2.21	2.15	2.37	2.57	2.45
Casablanca	2.64	2.61	2.64	2.27	2.37	2.36	1.47	1.71	1.70	2.28	1.74	1.74
Chefchaouen	2.70	3.31	3.35	2.57	2.85	2.69	1.56	2.00	2.33	-	2.50	2.50
El Hajeb	2.89	2.98	2.82	2.39	2.46	2.42	1.25	1.68	1.97	2.59	1.77	2.50
El Jadida	2.65	2.43	2.48	2.50	2.21	2.31	1.37	1.59	1.66	2.13	1.75	1.87
El Kelaa des Sraghna	2.39	2.60	2.70	2.26	2.31	2.44	1.33	1.49	1.64	2.65	2.10	3.25
Errachidia	3.20	3.40	3.40	2.97	3.00	3.05	1.65	2.04	2.24	2.55	2.30	2.72
Essaouira	2.20	-	2.27	2.08	-	2.23	1.19	1.40	1.54	1.99	1.52	1.80
Fes	2.94	3.55	3.06	2.27	3.05	2.71	1.52	2.38	2.15	2.70	-	2.52
Figuig	3.18	3.33	3.76	2.48	2.56	3.20	1.74	1.82	2.57	2.05	2.81	3.34
Guelmim	2.50	-	-	2.30	2.23	2.67	1.20	1.34	1.84	3.23	-	-
Ifra	3.10	3.13	3.45	2.68	2.59	2.54	1.85	2.04	2.12	2.20	1.95	2.23
Kenitra	2.31	2.76	2.75	2.14	2.24	2.31	1.40	1.71	1.65	2.19	1.88	2.16
Khemisset	2.79	3.63	3.16	2.20	2.98	2.61	1.49	2.23	1.97	2.10	2.03	2.16
Khenifra	2.82	2.75	2.89	2.46	2.45	2.65	1.36	1.88	2.15	2.15	1.89	2.09
Khouribga	2.31	2.40	2.50	2.28	2.17	2.31	1.49	1.70	1.93	-	-	-
Larache	2.64	2.26	3.17	2.46	2.70	2.65	1.87	-	2.20	-	2.00	2.50
Marrakech	2.69	3.07	2.91	2.65	2.59	2.58	1.34	1.54	1.68	3.27	2.04	2.46
Meknes	2.89	2.40	2.73	2.39	2.59	2.37	1.25	1.90	1.72	2.59	1.93	1.90
Nador	3.20	3.45	-	2.74	2.99	2.80	1.95	2.13	1.95	-	-	-
Ourzazate	-	-	3.60	2.95	3.25	3.28	1.80	1.96	2.26	2.37	2.61	2.94
Oujda	2.97	2.75	3.40	2.58	2.50	3.08	1.53	1.86	-	-	-	-
Rabat	2.56	3.02	2.74	2.18	2.34	2.31	1.50	1.47	1.52	2.44	1.95	2.11
Safi	2.32	2.46	2.53	2.20	2.21	2.20	1.28	1.44	1.67	2.13	1.74	1.87
Settat	3.38	2.36	2.37	2.28	2.19	2.23	1.34	1.29	1.57	2.24	1.73	1.94
Sidikcem	1.96	2.64	3.21	1.75	2.40	2.89	1.20	1.76	1.52	1.45	2.00	-
Tanger	2.86	2.99	2.88	2.64	-	2.75	1.88	1.93	2.41	2.00	2.50	2.50
Taounate	2.64	2.71	2.43	2.22	2.47	2.03	1.57	1.77	1.82	2.70	-	-
Tata	2.53	-	-	2.33	2.44	2.83	1.43	1.41	1.85	-	-	-
Taza	2.65	2.94	2.98	2.16	2.54	2.52	1.53	1.96	1.93	-	-	2.60
Tetouan	3.35	3.07	3.00	2.88	2.60	-	1.75	-	2.50	2.75	2.00	-
Average	2.58	2.72	2.70	2.32	2.51	2.45	1.44	1.68	1.81	2.18	1.77	1.97

Table V3.7.4: Farmgate Prices of Agricultural Commodities (1995/96-97/98) (2/5)

Provinces	Oats			Sorghum			Broad Beans			Green Peas		
	1995/96	96/97	97/98	1995/96	96/97	97/98	1995/96	96/97	97/98	1995/96	96/97	97/98
Agadir							4.20					
Al Hoceima		2.75					4.89	3.38	4.11	5.38	3.00	3.83
Azilal							3.81	3.30	4.45	4.10	3.64	
Ben Slimane	2.49	2.89	2.83				4.40	3.63	3.75	6.71	3.39	4.21
Beni Mellal							3.92	3.45	3.84		3.57	12.37
Boulemane			3.00				4.50		4.04			
Casablanca	3.42						4.00	3.53	3.50	9.33	4.00	3.30
Chefchaouen				1.43	1.90	2.60	3.10	4.00		7.50		
El Hajeb		1.80						3.55	3.79			3.75
El Jadida	1.28	1.54	1.74				3.54	3.37	3.91	3.06	6.70	
El Kelaa des Sraghna							4.56	3.18	3.61			
Errachidia							3.80	3.72	3.47	9.10		
Essaouira							3.32	3.50	3.33			
Fes							3.44	4.50	4.45	5.73		10.96
Figuig								3.73				
Guelmim												
Ifrane	2.50						2.95		4.50	8.00		
Kenitra	2.00			2.54	2.52	2.28	4.10	4.35	5.39	3.87	4.00	4.75
Khemisset	1.38	3.31	2.31				3.78	4.21	3.79	3.00	4.27	3.58
Khenifra							3.90	3.40	3.30			4.10
Khouribga												
Larache				1.69	1.60	2.50						
Marrakech							4.22	3.53	3.85	9.21		
Meknes	2.38	2.52	3.00				2.15	3.57	3.27	3.61	7.37	8.49
Nador												
Ourzazate							4.84	3.09	3.85			
Oujda	2.10											
Rabat	1.84	3.00	3.09						4.15			
Safi							2.94	3.17	3.37	3.51	3.13	
Settat							3.04	3.17	4.27	4.18	3.49	3.75
Sidikcem		2.40	2.60	1.55	3.04	2.71	8.36	4.20	4.83	8.38	8.00	4.04
Tanger	3.00			2.49	2.38	2.41	3.94			4.00		
Taounate	2.43	3.50	3.00	2.90		3.50	3.26	3.75	4.68	4.18	9.25	6.00
Tata												
Taza			3.44				3.49	3.45	3.71	4.00		3.80
Tetouan				2.00	1.80	2.50						
Average	1.92	2.77	2.66	1.99	2.03	2.50	3.68	3.49	4.05	4.80	4.63	5.70

Table V3.7.4: Farmgate Prices of Agricultural Commodities (1995/96-97/98) (3/5)

Provinces	Lentil			Chick Peas			Orope			Green Beans		
	1995/96	96/97	97/98	1995/96	96/97	97/98	1995/96	96/97	97/98	1995/96	96/97	97/98
Agadir												
Al Hoceima	4.33	3.98	3.43	4.00	4.88				3.00		6.00	
Azilal	4.45	3.74	4.72	5.50	3.60					6.25	5.33	5.33
Ben Slimane	5.04	3.16	4.09	9.00	3.41	3.34				7.25		6.13
Beni Mellal										6.50	4.81	5.03
Boulemane			4.97	9.52		4.68			3.90	7.63		7.50
Casablanca	5.00	3.50			4.00							
Chefchaouen	8.50	6.00		9.40	6.50		3.45	4.10		13.75	9.00	7.50
El Hajeb		3.23	5.00		3.70	3.50					4.17	
El Jadida					3.50							3.50
El Kelaa des Sraghna												
Errachidia	7.87		7.50									7.25
Essaouira												
Fes	4.54	5.13	5.76	10.83	4.21	4.82	3.00	3.00	3.49			8.92
Figuig												
Guelmim												
Ifrane	5.90	6.98	8.00	9.95	6.50	6.25				7.85	10.00	
Kenitra	5.50	3.83		5.91	3.98	3.88	2.85	2.73		6.98	5.97	5.76
Khemisset	6.25	4.82	5.59	9.60	5.30	4.01					8.11	
Khenifra	4.00	5.03	4.00	15.00	5.58	5.22				5.00	8.95	7.00
Khouribga	4.50											
Larache	5.50			7.80	7.00					6.00	6.50	7.75
Marrakech	6.00	2.92	4.65									
Meknes	6.18	4.31	6.22	9.06	4.59	3.51	2.90	2.72			5.22	4.07
Nador										8.00	8.00	8.00
Ourzazate												
Oujda												
Rabat					3.25							
Safi	4.65	3.25	3.54	9.00	3.54	3.71				6.00	5.00	
Settat	4.00	3.18	4.23		3.19	3.57						
Sidikcem		4.92	6.00	9.34	4.74	4.50	3.05	2.72			5.67	7.00
Tanger		5.00		10.60	5.35	5.50						
Taounate	6.27	4.14	5.17	9.81	4.12	4.18	3.23	3.83	2.60			
Tata												
Taza	4.33	2.90	3.60	7.00	3.39	4.18	2.91	2.50	3.24			
Tetouan												
Average	5.10	4.11	4.88	8.75	4.41	4.08	3.02	3.04	3.03	8.02	6.64	6.56

Table V3.7.4: Farmgate Prices of Agricultural Commodities (1995/96-97/98) (4/5)

Provinces	Sun Flower			Ground Nuts			Tomato			Potatoes			(In DH/KG)
	1995/96	96/97	97/98	1995/96	96/97	97/98	1995/96	96/97	97/98	1995/96	96/97	97/98	
Agadir							1.81	1.27	2.19	2.13	1.82	3.07	
Al Hoceima							2.00	1.81	1.97	1.75	1.74	2.83	
Azilal									0.68	2.05	1.74	2.44	
Ben Slimane			3.50				1.49	1.13	1.70	1.95	1.56	2.66	
Beni Mellal										2.11	1.25	2.50	
Boulemane							1.90		1.50	1.96	2.00	2.65	
Casablanca							1.64	1.23	1.27	1.32	1.01	1.55	
Chefchaouen							1.83	2.00	1.87	2.33	2.50	2.87	
El Hajeb		3.50	4.00					0.70	1.00		1.20	2.06	
El Jadida							1.50	1.33	1.06	1.79	1.46	1.71	
El Kelaa des Sraghna							1.25	1.00	0.80	2.19	1.25	2.73	
Errachidia							1.25	3.13	2.50	1.90	1.74	3.37	
Essaouira													
Fes													
Figuig													
Guelmim													
Ifrane										2.99			
Kenitra	3.62	3.80	3.88	5.52	5.43	6.36	1.78	1.27	1.92	1.98	1.66	2.03	
Khemisset							2.25	2.20	1.50				
Khenifra										1.39	1.72	2.77	
Khouribga										2.50	2.00	2.00	
Larache	3.45	3.00	4.83	6.04	6.42	7.56	1.20		0.55	1.67	1.38	2.62	
Marrakech							1.67		2.40	1.98	2.05	2.10	
Meknes	4.00	3.56	4.33						1.10		1.41	2.63	
Nador	3.70	3.75	3.80				1.83	2.25	2.50	1.95	2.33	3.00	
Ourzazate										1.50	2.50	3.00	
Oujda							1.48		2.00	1.40	2.54	3.33	
Rabat							1.20	1.58	2.23	1.72	1.70	1.96	
Safi							1.43			1.77	2.00		
Settat							1.67			2.09	1.50	2.50	
Sidikcem	4.00	3.95	3.75										
Tanger	3.50			5.93	6.40	8.50	1.20		1.62	1.90		2.44	
Taounate		3.70	8.00					1.00	1.75	2.00		3.50	
Tata													
Taza													
Tetouan										2.00		2.60	
Average	3.62	3.67	4.05	5.71	6.19	7.27	1.61	1.56	1.63	1.90	1.77	2.53	

Table V3.7.4: Farmgate Prices of Agricultural Commodities (1995/96-97/98) (5/5)

(In DH/KG)

Provinces	Onion			Olives			Peeled Almonds			Grapes		
	1995/96	96/97	97/98	1995/96	96/97	97/98	1995/96	96/97	97/98	1995/96	96/97	97/98
Agadir	3.00	2.00			3.25	2.25		32.05	35.33			
Al Hoceima	2.00	1.59	1.78		2.92	2.00	79.76	39.78	36.24			
Azilal			2.00	2.83	2.68	2.85	75.00	35.38	33.79			
Ben Slimane	1.78	1.75	1.92						40.00	2.85	2.84	3.08
Beni Mellal	1.72	0.73	0.63	2.95	2.85	2.98						
Boulemane				3.15	4.75	2.67	77.43	50.00	43.75			
Casablanca	1.93											
Chefchaouen	2.20	1.35	1.75	2.60	1.87	1.68	75.00	42.00		6.02	7.25	
El Hajeb		0.87	0.60	3.04	2.03	2.50				3.25	2.95	4.12
El Jadida	1.00	0.98	1.20							3.04	2.18	2.18
El Kelaa des Sraghna	2.38	1.28	0.91	2.33	2.00	3.15				4.41	1.72	3.09
Errachidia	2.25	1.38	1.75		3.13	2.25	99.00	50.00				
Essaouira	3.00	1.33	1.50	2.37	2.00	2.13	70.00	37.25	35.00	2.51	2.92	2.12
Fes				2.97	3.70	2.59						
Figuig				2.50	3.50	3.06						
Ifrane	1.25	2.50	1.20	3.04								
Kenitra				2.50	2.87	3.55				3.97	4.02	4.22
Khemisset										3.35	4.26	3.29
Khenifra	3.25	2.17	1.00	1.50	3.25	3.40						
Khouribga	2.00	1.25	1.00	3.15		2.00						
Larache				3.00	2.89	3.13						
Marrakech	2.53	1.30	1.23	2.68	2.18	2.97	72.00	37.54	35.18	3.04	3.20	3.79
Meknes		0.85	0.87	2.50	2.74	2.23		45.00		3.47	3.47	2.97
Nador		1.75	1.50	2.31	3.06	2.30		42.50	42.50	4.31	3.13	4.48
Ourzazate		1.35		3.38	4.10	2.04	84.67	33.97	35.00			
Oujda				4.00	3.67	3.37		35.00	38.33	3.94	4.03	4.32
Rabat	2.00									1.95	3.07	3.57
Safi	2.12	1.50	1.00	2.90	2.66	2.59			40.00	3.37	2.80	2.54
Settat	1.77	0.92	1.05			2.50						
Sidikcem				2.31	3.38			40.00		4.45	4.71	4.20
Tanger	1.95		1.66									
Taounate	1.70			3.62	2.01	1.67	50.00	35.00	35.00			
Taza	2.50			2.50		1.92						
Tinzit	2.42	1.00	1.50		2.25			40.00	31.50			
Average	1.90	1.33	1.34	2.88	2.91	2.35	79.54	39.70	36.11	3.25	2.94	2.92

Source: Prix Payes aux Producteurs des Produits Agricoles

Ministere de la Agriculture du Development Rural et des Peches Maritimes, Direction de la Programmation et des Affaires Economiques, March, 1999

Table V3.7.5: Monthly Average Market Prices of Agricultural Commodities (1999)

(DH/Kg)

Month/ Commodity	Retail Price					Wholesale Price				
	Hard Wheat	Soft Wheat	Barley	Maize	Apple	Oranges	Bananas	PDT	Tomatoes	Onions
January	3.2	2.8	2.3	2.3	5.86	1.31	6.77	1.59	1.3	1.43
February	3.2	2.7	2.4	2.4	6.27	1.53	6.8	1.38	1.07	1.66
March	3.2	2.8	2.5	2.5	6.28	1.65	6.8	1.64	0.95	1.77
April	3.3	2.8	2.4	2.4	6.21	1.68	6.75	1.58	0.77	1.56
May	3.3	2.6	2.4	2.4	6.52	1.56	6.72	1.41	1.09	1.08
June	3.1	2.6	2.3	2.3	5.07	1.65	6.86	1.76	1.25	1.02
July	3.1	2.5	2.2	2.2	4.01	1.83	6.86	1.89	1.4	0.83
August	3.1	2.6	2.1	2.1	3.68	1.92	6.98	2.06	1.37	0.68
September	3.1	2.6	2.1	2.1	3.89	1.92	5.67	2.09	1.39	0.75
October	3.1	2.6	2.1	2.1	4.1	1.95	6.68	1.97	1.48	0.94
November	3.2	2.7	2.1	2.1	4.73	2.13	6.49	2.02	1.4	1.17
December	3.2	2.7	2.1	2.1	5.63	1.61	6.17	1.89	1.85	1.29
Average	3.18	2.67	2.25	2.25	5.19	1.73	6.63	1.77	1.28	1.18

Source: Ministere de l'Agriculture du Development Rural et des Peches Maritimes, Direction de la Programmation et des Affaires Economiques, March, 2000

Table V3.7.6: Retail Prices of Fertilisers In Casablanca (1999-2000)

Type of Fertiliser	2 Jul '99	13 Jul '99	1st Oct. '99	12 Nov. '99	2nd Feb. '00	(DH/QI) Change (%)
	(a)	(b)	(c)	(d)	(e)	(e)/(a)
Urea 46%	146.95	108.42	108.42	125.26	134.00	-8.81
Ammonitrade 33.5%	123.56	101.03	101.03	96.89	133.00	7.64
Sul. D'Amm 21%	93.50	93.50	93.50	93.50	98.00	4.81
Sul.De K(P) 50%	309.38	266.69	266.69	255.79	255.79	-17.32
Sul. De (G) 50%	325.15	325.15	325.15	319.77	319.77	-1.65
Chi. De K (P) 60%	140.96	140.96	140.96	140.96	140.96	0.00
Chi. De K (G) 60%	200.38	200.38	200.38	200.38	200.38	0.00
TSP 45%	207.87	207.87	189.31	189.31	189.31	-8.93
ASP (19-38-0)	277.58	277.58	277.58	277.58	277.58	0.00
NPK (14-28-14)	247.14	247.14	247.14	247.14	247.14	0.00
MAP (11-55-0)	268.56	268.56	243.96	243.96	243.96	-9.16
DAP (18-46-0)	256.24	256.24	232.60	232.60	232.60	-9.23
SSP 18% (P)	86.00	86.00	86.00	86.00	86.00	0.00
SSP 18% (G)	93.00	93.00	93.00	93.00	93.00	0.00

Source: FERTIMA

Table V3.7.7: Prices and Subsidies of Major Cereal Seeds (1990/91-1999/00)

Agricultural Year	Hard Quality Wheat (Ble Dur)				Soft Quality Wheat (Ble Tendre)				Barley (Orge)			
	P.P	SUBV	P.U	Change (%)	P.P	SUBV	P.U	Change (%)	P.P	SUBV	P.U	Change (%)
1990/91	305	0	330	-	300	20	305	-	225	40	210	-
1991/92	350	0	380	15.15	345	20	355	16.39	259	40	249	18.57
1992/93	350	0	386	1.58	345	0	381	7.32	259	0	295	18.47
1993/94	420	75	386	0.00	415	75	381	0.00	329	75	295	0.00
1994/95	350	0	391	1.30	345	0	386	1.31	259	0	300	1.69
1995/96	420	70	391	0.00	395	50	386	0.00	309	50	300	0.00
1996/97	360	0	407	4.09	345	0	391	1.30	240	0	285	-5.00
1997/98	405	25	427	4.91	390	25	411	5.12	285	25	305	7.02
1998/99	380	20	407	-4.68	365	25	386	-6.08	280	0	310	1.64
1999/00**	397	45	400	-1.72	367	50	370	-4.15	285	30	295	-4.84

Note: 1) P.P: Production Price

2) P.U: Application Price

3) SUBV: Unitary Subsidy

**: Revised Price

Source: Ministry of Agriculture, Rural Development and Fisheries