

# **IRAQ**

## **COUNTRY REPORT ANIMAL GENETIC RESOURCES**

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# Chapter 1

## Background

### - Geography:

The Republic of Iraq with a total area of 435,052 sq. km is situated in the South – West Asia, and lies between latitude 29°5′ and 37°22′ North and longitude 38°45′ and 48°45′ East, and therefore displays a great diversity of climate (continental and subtropical) and soil types. The two rivers Tigris and Euphrates and their tributaries add further variation to the environment and create different zones and habitats.

Iraq is bordered by Iran from the East, Syria and Jordan from the West, Turkey from the North and Saudi Arabia, Kuwait and Arabian Gulf from the South. The longest axis of Iraq which runs in a N. W. to S. E. direction from the Turkish frontier above Zakho to the Shore of the Gulf at Fao, is about 1000 km. Its greatest width, which runs in the direction N. E. to S. W., is about 750 km long (Figure 1).

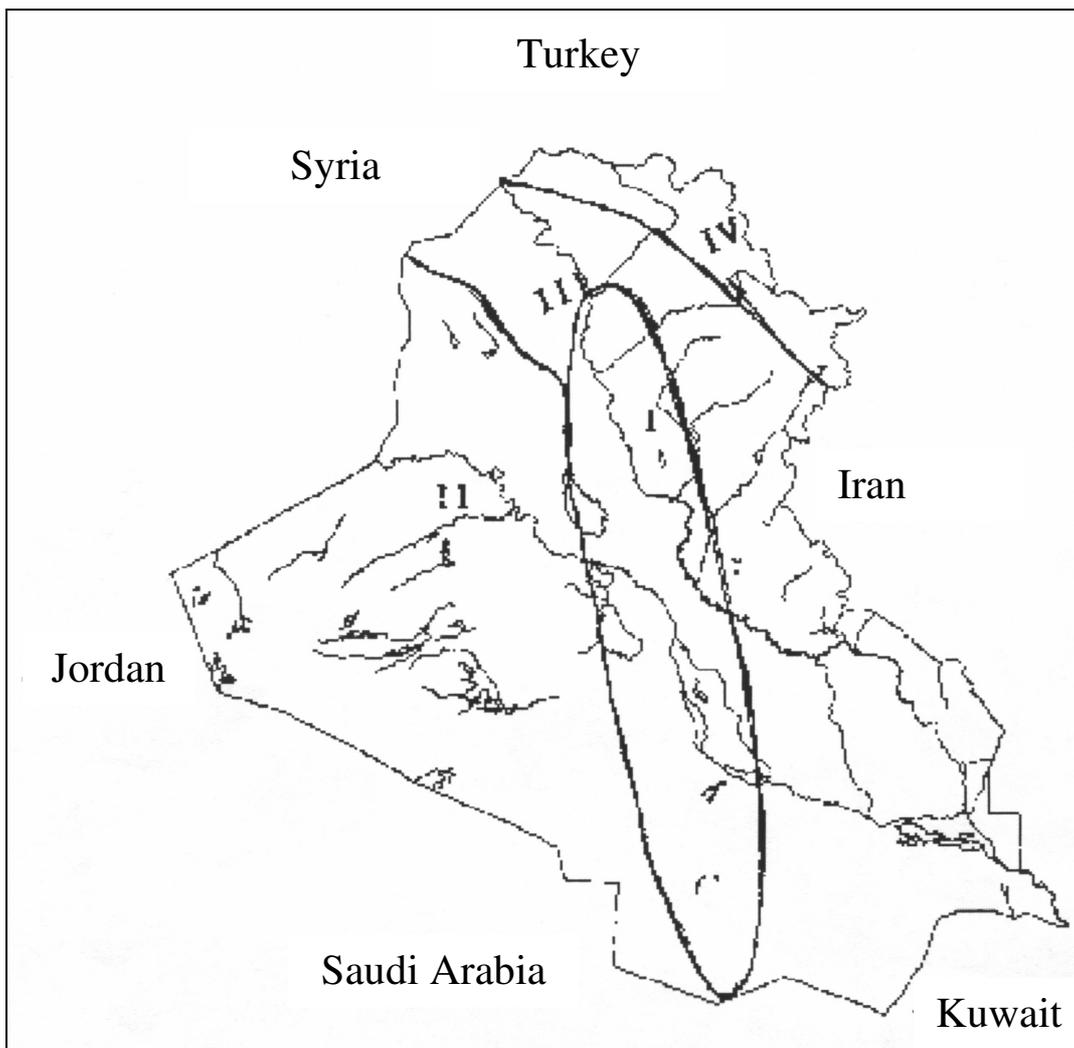


Fig.1: Agro ecological region of Iraq.

### **- The climate:**

The climate of Iraq is of the semi-arid type, designated as “continental, sub-tropical”, chiefly characterized by wide diurnal and annual ranges of temperature.

The following four main variants of the climate of Iraq are:

1. The climate of the Southern desert, with low rainfall (50-150 mm) and a mean January temperature not below 10° c. The season of the rain generally falls between November and March. There are two pronounced seasons, winter and summer starting at the end of April.
2. The climate of Western desert, lower Jazira and parts of the lower alluvial plains, with annual rainfall between 100-200 mm; Mean January temperature is below 10°c., and the main growing season is in the period March to April.
3. The climate of the steppe zone of the upper plains and foothills, with an annual rainfall of 300-600 mm. Though January temperature here is 7°c, with absolute minima below -15°c., there is a rapid rise of temperature in March accompanied by sufficient rain during the late spring (March-May) that helps in the development of a rich perennial herbaceous flora.
4. The climate of the mountain region, with a higher rainfall (700-1200 mm or more) distributed over a longer period of months and even more severe winter. The mountains, above approximately the 1800-m. level, are snow-bounded for several months and snow often falls in the valleys. The vegetation here does not begin to develop much until the end of April and the main growing period is from May to June onwards.

### **- The Topography:**

The following geographic sub-division of Iraq based on well-defined physiographic features are:

#### **1- Mountain region:**

This region which forms about quarter of Iraq’s area (92000 sq. km) is bounded by the N and N. E. frontiers of Iraq with Turkey and Iran respectively. The mountains varying from some 500-800 m in altitude in the lowest valleys to from 2000 to over 3500 m, at the summits of the highest ranges. This mountain region is extremely crumpled and contorted; it is traversed by many deep gorges where streams have cut down sharply into the limestone rock.

Extensively oak forests occupy the mountain slopes in the 500-1800 m. belt. Above the tree line the mountains are generally rather barren and rocky, and the passes are blocked with snow during winter months.

Many well-watered valleys are to be found in the mountains, some- times opening out into high rolling plains. The people cultivate and grow fruit in these valleys but the greater part of this mountain region is forest and high summer pastures.

## **2. Alluvial plain region:**

This low range of hills, mostly some 200-m in height, more or less, separates the lower alluvial plain from the rolling upper plains of the sub- mountain belt and foothills. The general elevation of the land in this region which forms an area of about 132500 sq. km varies from about 200 to 500 m. above sea level, and the rainfall increases as the mountains are approached. Within this region, where the soil is exceptionally fertile, there is a large settled agriculture population; rain-cultivated winter wheat being the principle crop.

## **3. Desert plateau region:**

This region is the widest and forms about half of the country's area (168552 sq. km), it is bounded to the North and North-West by the lower boundary of the upper plains and foot hills region and the East and South- East by the right bank of the Euphrates. Here lies the vast rather featurless desert region rising a height of 1000 m in its western most parts. To the North-West of Baghdad, in the area between the two rivers, lies a smaller but none the less substantial tract of desearth; the Jazira.

## **4. The Terrain region:**

The great alluvial plain comprising the remainder of the territory of Iraq. It is bounded by the desert plateau region to the North-West, West and South, and by the lower region of the upper plains and foothills region and the Persian frontier to the north-east and east. Historically, for many hundred years, it has formed an immense tract of the irrigated lands or lands were irrigated in former times. Thus, though climatically and phytogeographically desert, its character has been completely changed. Little of its natural vegetation now remains. Crops and other cultivated plants, patches of secondary vegetation and barren saline patches where hardly a plant can grow, constitute most of the area.

## **- Land Resources and use:**

The total area of Iraq is 435,052 sq. km. in which about 924 sq. km covered by water forming 0.2% of the total.

Topographically, there are four distinct regions namely; the arid or desert (39.7%), the plains (30.5%), the terrain land (9.7%) and the mountains (21.1%) (Table 1-1).

Total land suitable for agriculture production amounts to approximately 11.1 million Ha, in which 50.2% falls under the irrigated region and 49.8% under the rainfed. Out of the irrigated area about 50%

is not available for agriculture production, therefore, only 2.805 million Ha is used (Table 1-2).

Cropping system concentrates mainly on cereal production (85.2%), followed by vegetables (8.5%), oil crops (1.9%), feed stuff (1.7%), tubers (1.2%), industrial (0.8%) and pulses (0.7%). (Table 1-3).

**Table 1-1: Land resources in Iraq**

Type	area (km <sup>2</sup> )	%
Deserts	168552	39.7
Alluvial plains (including marshes and lakes)	132500	30.5
Mountains	92000	21.1
Terrain lands	42000	9.7
<b>Total</b>	<b>435052</b>	<b>100.0</b>

Source: Statical FAO year book (1995-1996).

In 1990, FAO estimated total agriculture area by 9.590 thousand Ha, 4000 of which forms the perminant pasture, and the remaining area (5.590) is used for crop production. In 1999, the estimated agriculture area was 5.540 thousand Ha, and that for perminant pastures 4.000 thousand Ha too. Taking these figures into account, perminant pastures constitute about 9.1% of the total area.

**Table 1-2: Land usable for agriculture production according to method of irrigation**

Cultivable land	Area (m.Hac)	% importance	% total importance
Suitable for Agriculture	11.1	-	100.0
<b>1. Irrigated</b>	<b>5.575</b>	<b>100.0</b>	<b>50.2</b>
Natural passive irrigation	1.668	29.9	
Machine irrigation	1.137	20.4	
Not available for use	2.770	49.7	
<b>2. Rainfed</b>	<b>5.540</b>	<b>100.0</b>	<b>49.8</b>
guaranteed	0.831	15.0	
semi-guaranteed	1.274	23.0	
Not – guaranteed	3.435	62.0	

Source: Arab Agric. Policies during the ninties (Iraq Country Report). AOAD, November 2001.

**Table 1-3: Crop distribution (%) for cultivated land in Iraq (for 1971-1999)**

Crop	year		
	70-80	81-90	90-99
Cereals	86.3	86.4	85.2
Oil crops	0.8	1.2	1.9
Industrial	1.5	0.8	0.8
Pulses	1.9	0.9	0.7
Feed stuff	1.2	1.8	1.7
Vegetables	7.6	8.1	8.5
Tubers	0.7	0.8	1.2
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100</b>

Source: Arab Agric. Policies during the ninties (Iraqi country Report). AOAD, November 2001.

**Table 1-4: Land use in Iraq (1000 Ha)**

Category	1990	1999
Total area	43832	43832
Permanent crop	290	340
Permanent pasture	4000	4000
Forests and woodlands	192	NA
Non arable and Non permanent	38147	39197
Arable and permanent	5590	5540
Irrigated	3525	3525

Source: FAO FAOSTAT Database 1990-2001. NA: Not available

### - Land Tenure:

Land tenure statistics in 1988, according to sector and seasonal cropping was shown in table (1-5).

The public sector which includes the state farms, collective farms and cooperatives forms the major activity of agriculture production compared to the private sector; it represent more than 4 folds in winter cropping area and more than 9 times during summer cropping. Generally summer cropping area is only 5.8% of the winter area.

**Table 1-5: Land tenure by sectors (1000 ha) and area cultivated in winter and summer**

Sector	Winter cropping	Summer cropping
State farms	35.8	9.5
Collective farms	22.5	24.7
Cooperatives	2022.2	102.6
Total public	2080.5	136.8
Total private	19.6	9.3

Land tenure in 1979 indicated that about 75% of agriculture holdings are small and not exceeding 12.5 ha; the total area covered by such holdings amounts to about 27% of the total arable land (table 1-6).

**Table 1-6: land tenure in 1979**

Land size (ha)	% owners of such	% area of such
Up to 2.5	25.9	2.2
2.5-7.5	27.6	9.5
7.5-12.5	23.1	15.4
12.5-20.0	11.3	12.1
20.0-30.0	5.4	9.5
30.0-50.0	4.1	10.3
50.0-100	1.2	6.2
100-150	0.4	3.5
150-250	0.3	4.9
250-400	0.2	4.5
400-500	0.1	2.5
< 500	0.2	19.4
	100%	100%

Source: AOAD yearbook of statistics 1986, Vol 6.

Total number of land owners were about 470400 and total area covered was 62792 (thousand ha).

## Constraints for Agriculture production

The constraints in Agriculture production are many, top of the list is the insufficient water for irrigation, insecure and deficient rainfall, soil salinity, restricted land reclamation, insufficient agriculture inputs and supplies. The economic sanction for the last 12 years added more constraints reflected on shortage of certified seeds, machinery, power supply, fertilizers, pesticides .... etc.

### - Population:

Population census is usually done every 10 years started from 1927; the last was in 1997.

Figures showed that Iraqi population was 4.8 million in 1947, increased to 13.3 m in 1980 and to 22.5 m. in 1997 (Table 1-7). Average population growth was about 3% which is one of the highest in the world.

Rural Population is in continuous decline from 64% in 1947, to 36.3% in 1977 and to 29.8% in 1987. The result of 1997 showed an increase in rural Population to about 31.9%.

The relative distribution of those over 15 years of age representing the working power, showed a continuous rise of % agriculture power from 12.5% in 1990 to 18.0% in 1999. This of course reflects the importance of agriculture in Iraqi economy (Table 1-8). Such power is in need of training and experience in adapting new technologies. Percent of women in agriculture working power is higher than that of males during 1977/1987.

**Table 1-7: Iraqi population and growth of urban and rural for the period 1977-1987 and 1997 (in thousands)**

Year	Total population	Urban	%	Rural	
1977	12000	7646	63.7	4351	36.3
1987	16335	11459	70.2	4866	29.8
Growth rate	3.1%	4.1	-	1.1%	-
1997	22018	14994	68.1	7024	31.9
Growth rate		2.7%	-	3.7%	-
1987-1997	3.0%				
1998	22679				
1999	23359				

Source: Agric Policies in Arab world (Iraqi Report) during the nineties. AOAD, 2001.

**Table 1-8: Iraqi population and % total working and agriculture power for the years 1990-1999**

Year	Total Population (Thouwords)	% total working power	% Agric working power
1990	17890	24.0	12.5
1992	18949	24.0	15.0
1994	20007	24.0	16.0
1996	21102	26.8	18.0
1997	22018	26.7	18.0
1999	23353	27.3	18.0

Source: Agric Policies in Arab world (Iraqi Report) during the nineties. AOAD, 2001.

### - Livestock population and production:

Iraq have a lage number of farm animals (Table 1-9). From 1990 to 1999, all animal species showed a sharp decline. The highest decline occured in camels, chicken and buffalo with percent decline of 87.28 , 72.50 and 57.33 respectively. Goat population is the only one that conserved its number.

Such decline was accompanied by a drastic decline in production (Table 1-10). This, coupled with the decrease in importation (Table 1-12), was reflected on per capita availability of all animal products, protein and calories.

For the purpose of comparison, per capita consumption of total protein in Iraq is only 71 gm /day, 20% of which is animal protein. The international average is about 67.7 gm /day, 33% of which is animal pretein, while in developed countries, the per capita is 91 gm /day, 60% of which is animal protein.

#### The amount of protein was contributed as below:

Type of product	% contribution daily / capita protein
Red meat	23.4
Chicken meat	14.5
Fish	16.7
Eggs	6.2
Milk	39.2
Total	100%

Before the economic sanction, the sufficiency % from meat is about 70% and of milk 50%. This situation is further deteriorated during the last 10 years of the sanctions.

**Table 1-9: Animal population 1990-1999 (1000 heads)**

Animal	1990	1999	Decline %
Cattle	1,520	1,325	12,83
Sheep	9,600	6,750	29,68
Goats	1,550	1,550	Nil
Buffalo	150	64	57,33
Chicken	80,000	22,000	72,50
Camels	59	7,500	87,28
Horses	60	46	23,33
Asses	443	375	15,35
Mules	26	11	57.70

Source: FAOSTAT Database Results (1990-2001)

Animals usually raised extensively, specially sheep, goats and camels. Cattle and buffaloes usually raised semi-intensively. The intensive / extensive ratio is about 47:53 %.

Average animal population growth, before the 1990 was about 2-3%, while human population growth is about 3% Such ratios were completely different, with the animal population growth to the negative side after the 1990.

**Table 1-10: Major animal products (1000 ton / number).**

Species	Meat (ton)		Milk (ton)		Eggs (ton)		Fiber (ton)		Skin and Hides (No.)	
	990	999	990	999	990	999	990	999	990	999
Cattle	50,773	47,472	296,700							
Buffalo	2,858	-	25,000						324	239
Sheep	28,000	-	175,000				33,772	19,050	5,250	3,780
Goat	7,827	8,280	49,000						1,631	1,723
Camel	2,275	289	1,005							
Lama										
Horses										
Donkey										
Pigs										
Poultry	192,285	49,000			81,550	9,450				
Turkey										
Goose										
Ducks										
Rabbit										

Source: Ministry of Planning , Animal census 1986/1987

Farm animals are distributed on the three major geographical regions in Iraq, as in table (1-11). Such distribution is in line with the availability of pasture, feed stuff, rainfall, intensity of human population and market demand.

**Table 1-11: Geographical distribution of animal numbers (%)**

Type	North	Middle	South
Sheep	40.3	37.9	21.8
Cattle	22.1	47.4	30.5
Goats	50.4	37.0	12.3
Buffaloes	6.8	41.0	52.2

Source: Ministry of Planning , Animal census 1986/1987

#### - Use of Animals in Agriculture work:

Recently, most of the agriculture activities are mechanical; this trend is expanding even with more than 10 years of economic sanction. In the fifties, 95% of agriculture work activities was done manually using animals. In the second half of the seventy, mechanical power substituted more than 68% of the power needed leaving only 32% to be done by the use of animals. During the eighties 80% of the work is mechanically conducted; this was much higher during late nineties up till now.

#### - Imports and Exports:

Insufficiency in most agricultural products is a trend accompanied the production in this sector. Demand which is always higher than production caused a high level of importation. Table (1-12), reflects that the highest imports were during 1980, diminished by about 8.8% in 1990 and by more than 25% in 1999.

Export value of agriculture products was always very low. In 1999 the value of imports was more than 221 times that of export. Generally imports of agriculture commodities, including products as percent of the

total value, increased from 28% in 1986 to 36% in 1990 and to 65% in 1997 (Table 1-13).

Exports of animal products is very low and limited to skin and hides which amounted to about 6.5 thousand in 1999. Wool export was about 9,000 ton greasy weight in 1990.

**Table 1-12: Agriculture products imports and exports for the year 1980, 1990, 1999 in (1000 US \$)**

Year	Imports	Exports	Imports / Exports
1980	2.030.008	69.670	29.13
1990	1.851.528	59.876	30.92
1999	1.512.935	6.831	221.48

Reconstructed: FAOSTA Database Results 1990-2001

**Table 1-13: Import and export of agriculture commodities as % of the total for the year 1980-1998**

Year	Import%	Exports% of
1986	28	1.2
1987	36	1.1
1988	40	0.7
1989	34	0.8
1990	36	0.6
1991	39	2.1
1992	46	2.2
1993	41	0.9
1994	40	2.1
1995	46	1.9
1996	49	5
1997	65	4

Source: Food security in Iraq (1998). AOAD.

Analysis and Evaluation of Agriculture Policies in Iraq. Baghdad (2000) (p: 65)

Note: The balance of Agriculture trade is always negative.

The imports of animal products, according to the type of products was given in the table (1-14). Importation after 1990 decreased sharply for most products.

**Table 1-14: Animal products imports (1000 ton / No.)**

Species	Meat (ton)		Milk (ton)		Egg (ton)		Fiber (ton)		Skin and hide (No.)		Animal (No.)	
	990	999	990	999	990	999	990	999	990	999	990	999
Cattle	48,350	52,0	34,000	1,900								
Buffalo												
Sheep	35,827	24,440					300,000					
Goat												
Camel												
Lama												
Horse												
Donkey												
Pigs												
Poultry	6,000	2,100			6,000	2,700						
Turkey												
Gease												
Duck												
Rabbit												

Source: Food security in Iraq (1998). AOAD.

# Chapter 2

## Livestock Production Systems

Livestock production systems generally lag behind crop production ones in terms of development, standards of management and husbandry and mechanization.

Traditionally, crop farming and livestock production are carried out as separate activities, proper mixed farming is rare.

Livestock feeding generally depends on natural pastures (rangeland) and crop residues. Forage is produced in only very limited scale.

**Four types of livestock production systems can be identified:**

### **1- Traditional system:**

The operation of this system takes place under sedentary, transhumant and nomadic system. In the nomadic and transhumant, flocks of sheep and goats, sometimes even few cows, are grazed extensively on natural vegetation. Some transhumant make use of crop residues available in the nearby cropping area.

The movement of the majority of flocks in the transhumant system is restricted to closed zones compared to the wide range movement of the nomadic flocks where they cover long distances following the availability of pasture and water according to seasons.

In the sedentary system, livestock and crop production is combined but not integrated. The main sources of animal feeds are stubble and crop residues supplemented with roughages of cultivated land where some flocks have an access for forage crops, included in the rotation program. In this system the practice of keeping cattle for milk production is noticeable.

The traditional system covers 90% of sheep and goat production in Iraq. Steppe and grazing areas utilized by this system are very arid or semi-arid where rainfall is unpredictable and scarce and only during winter. Such areas is not suitable for other agricultural purposes.

### **2- The household system:**

Under this system sheep and goats are kept around the house to produce milk for family use. Cattle are also kept for the same purpose, but in a very limited numbers (2-5) per family.

This system is usually practiced in the villages; it also exists in towns and cities, but on a limited scale.

Animals are usually kept in enclosures round the family living area; feed is purchased sometimes supplemented by occasional browsing and grazing where available.

Productivity of animals under this system is extremely low and the overall standards and measures of management, hygiene, disease and pest control are far below satisfactory.

### **3- Modern and semi-intensive system:**

This system is characterized by some modern methodologies that allow intensification. It is usually practiced in most of the large scale projects, specially dairy cattle state built projects and some other smaller private enterprises. The introduction and usage of new technologies is usually expanding continuously.

Fodder is mostly locally produced and supplemented with bought concentrate and barley according to nutritional requirements. The standards of hygiene, management, pest and disease control are of a quality that allowed better productivity in comparison with other production systems. Moreover, under this system, mixed farming or an integrated crop / livestock production is also practiced on a limited scale.

### **4- Fattening system:**

This covers fattening of lambs and calves for meat production. Lambs of 4-5 months (after weaning), weighing 15-20 kg, that are produced on the farm or bought from outside are fattened for few months to reach a slaughter weight of about 35-40 kg.

In case of local calves, they are usually bought at weaning age of about 6 months. Calves, bought from large scale farms are usually at their first week of age. Local breed calves are usually fattened to about 120-150 kg, while pure Friesians and their cross with local cattle finish at about 250-300 kg at the age of one year.

Fattening diets are usually of high energy concentrate based on barley.

Fattening usually takes place in feed lots. Most people, practicing this production system, do not possess their own lambs or calves but they rely on getting those from the local market.

### **- Constraints on Improvement:**

Improvement faces many constraints, top of such are:

- 1- Shortage of feed: Available information indicates that animals rarely get more than 70% of their nutritional requirements specially with the nomadic, sedentary and transhumant systems.
- 2- Harsh environment: The harsh arid and semi-arid climate with its extreme temperatures, humidity and sandstorms, adversely affect

animals. The limited and irregular rainfall limits the availability of fodder as part of the cropping program. The recurrent or persistent draught is a common feature of the area.

- 3- Health: The instability of flocks and continuous movement made veterinary services difficult. Endemic diseases are the cause of high mortality, morbidity and reduced productivity. This situation was aggravated by the economic sanctions imposed on Iraq since 1991. This was reflected, negatively, relatively on availability and quality of drugs, vaccines and other services.
- 4- Marketing: Marketing practices are improper and do not offer the producer any protection or incentives. They are not sufficiently flexible to encourage introduction of new technologies and management practices. Such practices, on light of the high inflation rate that appeared for the last 10 years, became very expensive and unaffordable by many producers. Credit facilities, specially those offered by the government, are inadequate and not always available specially for small producers and transhumants.
- 5- Prices: The current pricing policies for livestock products, though follow the general law of availability of supply and demand, are not geared towards meeting the requirements of producers. The feed / product price ratio should favour the producer, a case which is not existing. Some of the by-products, such as wool, is sold for a minimal price that even does not cause any concern to the producer.
- 6- Instability of agriculture policies: This situation impede the implementation of long-term breeding plans and the introduction and use of new technologies that add to the cost and need stability to be fruitful.
- 7- lack of recording: Proper recording, in the field of animal production, specially on the national level is nearly absent. The bureaucracy in handling or keeping records and their availability hinder timely action and endanger the efficiency of the production process that depends on analyzing related records.
- 8- Lack of coordination between research activities and production level prevents the implementation of research results by the targeted producers and impede orientation of research toward solving field problems.
- 9- Extension services and articulation is very weak and improper.

#### **- Inputs in animal production:**

It was noted before that the traditional system of animal production is still governing the sector. This was reflected on inputs introduced to the sector, (Table 2-1).

**Table 2-1: Distribution of animals according to the input of production systems (%)**

Species	Production System			
	low input	Average input	High input	Total
Cattle	60	30	10	100
Buffalo	98	2	-	=
Sheep	85	10	5	=
goat	95	5	-	=
Camel	98	2	-	=
Lama	-	-	-	=
Horse	10	20	70	=
Donkey	100	-	-	=
Pig	-	-	-	=
Poultry	10	10	80	=
Turkey	95	5	-	=
Gease	100	-	-	=
Duck	100	-	-	=
Rabbit	100	-	-	=

Source: Food security in Iraq (1998). AOAD.

It could be easily seen that system of low input constitute the majority, while high input is only dominant in the poultry production, followed by horses and then cattle on a limited scale.

There is no noticeable change toward an increase in application of high input systems in animal production, only in poultry production. Average and low input system characterized the change during the last 20 years in cattle, sheep and goat production system, (Table 2-2).

**- Types of animal farms according to the system of production:**

All farms of restricted sufficiency of cattle, buffalo, sheep , goats and camels are characterized by the low input while more than 80% of the small holdings farms are of such input. Average and high input system of production is practiced in about 15% of cattle , while high input is prevalent in 100% of the large scale dairy farms (Table 2-3).

Average input system is noticed in about 95% of the small commercial buffalo production (Table 2-4). There is no high input farms in sheep and goat production, where the low input characterizes the system of production of the latter (Tables: 2-5 ; 2-6).Camel production system are all of low input (Table 2-8).

In poultry low input farms characterizes the restricted and small holdings ones while 85% of the small commercial farms are of average input and 100% of the large scale ones, (Table 2-11), are of high input.

Turkey, duck, goose and rabbits have no registered projects and usually raised in private small holdings (Tables 2-12 to 2-15) with no specialized production system on measures of conservation.

**Table 2-2: Changes in the distribution of production systems during the last 20 years**

Species	Production System			
	low input	Average input	High input	Total
Cattle	++	+	0	
Buffalo			0	
Sheep	+	++	0	
Goat	+	0	0	
Camel	0	0	0	
Lama	N. A	N. A	N. A	
Horse	+	0	0	
Donkey	0	0	0	
Pigs	0	0	0	
Poultry	0	+	++	
Turkey	0	0	0	
Gease	0	0	0	
Duck	0	0	0	
Rabbit	0	0	0	

0 = stable

+ = increased

++ = sharp increase

N. A = Not available/Not applicable

**Table 2-3: Types of Animal Production farms according to the system of production for cattle (%)**

Type	Production system			
	Low input	Average input	High input	Total
Restricted sufficiency	100	0	0	100
Small holdings	85	15	0	100
Small commercial farms	70	15	15	100
Large scale farms	0	0	100	100

**Table 2-4: Types of animal production farms according to the system of production for buffalo (%)**

Type	Production system			
	Low input	Average input	High input	Total
Restricted sufficiency	100	0	0	100
Small holdings	80	20	0	100
Small commercial farms	5	95	0	100
Large scale farms	0	0	0	100

**Table 2-5: Types of animal production farms according to the system of production for sheep (%)**

Type	Production system			
	Low input	Average input	High input	Total
Restricted sufficiency	100	0	0	100
Small holdings	80	20	0	100
Small commercial farms	5	95	0	100
Large scale farms	0	0	0	100

**Table 2-6: Types of animal production farms according to the system of production for goat (%)**

Type	Production system			
	Low input	Average inp	High input	Total
Restricted sufficiency	95	5	0	100
Small holdings	95	5	0	100
Small commercial farms	0	0	0	100
Large scale farms	-	-	-	-

**Table 2-7: Types of animal production farms according to the system of production for Camels (%)**

Type	Production system			
	Low input	Average input	High input	Total %
Restricted sufficiency	98	2	0	100
Small holdings	95	5	0	100
Small commercial farms	0	0	0	
Large scale farms	-	0	0	

**Table 2-8: Types of animal production farms according to the system of production for Lama (%)**

Type	Production system			
	Low input	Average input	High input	Total %
Restricted sufficiency				
Small holdings				
Small commercial farms				
Large scale farms				

NA: Not applicable / Not available.

**Table 2-9: Types of animal production farms according to input for Horses**

Type	Production system			
	Low input	Average input	High input	Total %
Restricted sufficiency	0	0	0	0
Small holdings	95	5	0	100
Small commercial farms	0	0	0	
Large scale farms	0	0	0	

**Table 2-10: Types of animal production farms according to system for pigs (%)**

Type	Production system			
	Low input	Average input	High input	Total %
Restricted sufficiency				
Small holdings				
Small commercial farms				
Large scale farms				

NA: Not applicable / not available.

**Table 2-11: Types of animal production farms according system for Poultry (%)**

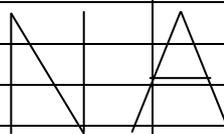
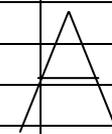
Type	Production system			
	Low input	Average input	High input	Total %
Restricted sufficiency	80	20	0	100
Small holdings	90	10	0	100
Small commercial farms	10	85	5	100
Large scale farms	0	0	100	100

**Table 2-12: Types of animal production according to system for Turkeys (%)**

Type	Production system			
	Low input	Average input	High input	Total %
Restricted sufficiency				
Small holdings				
Small commercial farms				
Large scale farms				

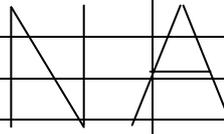
NA: Not available / Not applicable.

**Table 2-13: Types of animal production farms according to the system of production for ducks (%)**

Type	Production system			
	Low input	Average input	High input	Total %
Restricted sufficiency				
Small holdings				
Small commercial farms				
Large scale farms				

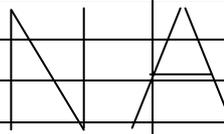
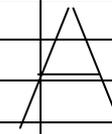
NA: Not applicable.

**Table 2-14: Types of animal production according to the system for goose (%)**

Type	Production system			
	Low input	Average input	High input	Total %
Restricted sufficiency				
Small holdings				
Small commercial farms				
Large scale farms				

NA: Not applicable.

**Table 2-15: Types of animal production farm according to the system of production for rabbit (%)**

Type	Production system			
	Low input	Average input	High input	Total %
Restricted sufficiency				
Small holdings				
Small commercial farms				
Large scale farms				

NA: Not applicable.

# Chapter 3

## State of genetic diversity

### Genetic Diversity of Farm Animals and Chicken

Local breeds of cattle, sheep, goats, buffalos and camels predominate the breeding and production sector of farm animals in Iraq. Chickens are always adapted from imported strains and raised either as pure lines or mixed with local Iraqi chickens. The latter still existing in reasonable numbers in villages and rural areas. Tables (3-1) (3-2) reflects the state of genetic diversity and the number of breeds that were characterized. Genetic characterization is needed using the new scientific technologies.

**Table (3-1): Genetic Diversity (number of breeds).**

Species	Total Number		Endangered		Breeds largely used		Other breeds		Vanished breeds	
	Local	Exotie	Local	Exotie	Local	Exotie	Local	Exotie	Local	Exotie
Cattle	4	2	-	1	4	1	-	-	-	5
Buffalo	1	-	-	-	1	-	-	-	-	-
Sheep	4	3	-	2	4	-	-	-	-	6
Goats	2	2	-	1	1	-	-	-	-	1
Camel	1	-	-	-	1	-	-	-	-	-
Lama	-	1	-	1	-	-	-	-	-	-
Horses	1	-	-	-	1	-	-	-	-	-
onkeys	1	-	-	-	1	-	-	-	-	-
Pigs	-	-	-	-	-	-	-	-	-	-
Poultry	4	-	-	-	2	2	-	-	-	-
Turkey	1	-	1	-	1	-	-	-	-	-
Goese	1	-	-	-	-	-	-	-	-	-
Ducks	1	-	1	-	-	-	-	-	-	-
Rabbits	1	-	-	-	-	-	-	-	-	-

**Table (3-2): Number of breeds characterized (no. of breeds)**

Species	On a population basic				On an individual basis			
	Basic Survey	Genetic relation	Breeding Values for Breeds	Market value	Perfor- mance records	Genetic diversity	Genetic relation	Molecular diversity
Cattle	5	None	1					
Buffalo	1	=						
Sheep	8	=						
Goats	4	=						
Camel								
Lama								
Horses	1							
Donkeys								
Pigs								
Poultry	4							
Turkey								
Goese								
Ducks								
Rabbits								

## **- Cattle: (chart 1-4)**

### **1- Local breeds:**

The main local breeds are the Jenubi, Karadi, Sharabi and Rustagi. Dishti is also another local breed in very limited numbers. Total population is estimated to be about 1.5 million head.

The charts contains some of the general characteristics of such breeds. Milk production is very low and estimated to be 600 – 1000 Kg/305 days of production for a lactation period of 220 – 250 days. Proper breed characterization was not conducted for any and studies are very rare and sporadic.

It was reported that local cattle are genetically resistant to endemic diseases and harsh environment.

### **2- Introduced Cattle:**

Though many breeds were imported from exotic regions and tried in Iraq, such as Jersey, Gurrency, Ayrshire, Hereford, Charoles, Brown Swiss, the most successful breed is the Friesian and sometimes the Holstein. This breed have been effectively imported to constitute the breed of choice for the supply of 16 Large Scale State dairy projects in Iraq. Those projects were planned to contain more than 40 thousand head at the time of their establishment during mid eighties. The State decided to privatize these projects and they were sold to the private sector when the total number was about 23 thousand distributed over the 16 projects during 1998. This represents the highest large scale cattle importation to Iraq.

Friesians are occasionally crossed with local cattle specially with the Jenubi to produce 50% cross which is sometimes upgraded to higher level through A.I. using Friesian semen.

Very recently, the Ministry of Agriculture imported frozen semen from France representing a new breed for experimental study.

## **- Buffaloes: (chart 5)**

Buffaloes can be divided into two distinct varieties according to habitat:

### **1. Marsh Buffaloes:**

Characterized by long deep body and limbs. It constitute more than 50% of the population of buffaloes in Iraq, chart (5).

### **2. City Buffaloes:**

Characterized by its large size and high milk yield. Usually raised round main cities specially Baghdad. It constitutes more than 30% of the population according to the 1978 census. They are more tamed and easy to handle than Marsh buffalo.

Differences in size and production of those two varieties could be attributed mainly to differences in ecological conditions.

Buffaloes in Iraq are well adapted and have high resistance to different endemic diseases and can tolerate adverse environmental effects. It utilizes plantation of marshy areas, where other animals do not take.

#### **- Sheep: (chart 6-7-8-9)**

Sheep are and will always be the most important farm animals in Iraq. The sheep population of the country in 1999 was estimated at about 6,750 million (FAO, 2001), and is distributed all over the country. The native breeds are the Awassi, Arabi, Karadi and Hamdani and are all of the fat-tail and carpet wool types. Some of their general characteristics are summarized in charts (6-9) It is worthy to note that Arabi, Karadi and Hamdani sheep were be characterized for most production and reproduction traits under experimental conditions but none, and all breeds are not characterized under farm conditions.

#### **Introduced breeds of sheep:**

To improve Awassi sheep in Iraq by crossing it with European breeds, limited numbers of Finnish landrace and Chios sheep were introduced and kept on state farms. Unfortunately, very limited data were published, In 1990 a well planned crossbreeding program was initiated with 200 Turkish Awassi, 50 Assaf, and 80 D'man sheep. The main objective was to obtain different genotypes to be evaluated under different production systems considering: a) adaptation to the prevailing environment b) prolificacy and c) improvement according to market demand.

#### **- Goat: (chart 10)**

The Native goat with its population of about 1.550 million in 1999 (FAO, 2001) is an another important genetic resource, and it is raised primarily for meat and milk production.

Meriz is the other native breed of goat which is not characterized. It is raised primarily for its fine hair. The general characteristics of both breeds are given in chart (10).

To improve local goat by crossing, limited numbers of Sannen and Shami goat were introduced and kept at IPA Agriculture Research Center to obtain different genotypes to be evaluated under different production systems.

### **- Camel:**

Two breeds or varieties of camels are available in Iraq. The Khawar and the Judi.

The Khawar is well known in its tolerance to thirst and shortage of feed. The Judi is well known for its strength.

Usually camels are animals of arid and semi arid zones and used to move freely in search of water and fodder.

Natural pastures, availability and richness, is the limiting factor for camel production in addition to the nature of land and environment.

A concentrated presence of camels in western terrain lands is noticeable; it harbours about (75%) of the population, followed by the peninsula terrian (19%) and the southern plains with about (8%).

Their number declined from (300) thousand in 1952 to only (55) thousand in 1988 and even less in 1999.

This decline is mainly due to lack of feed and very poor pastures that accompanied the very low rainfall for several years. Most of camel breeders, as a result of that, reverted to other professions around the cities and to sheep production.

**Chart 1**  
**Domestic Animal Diversity**  
**Information System**  


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**Jenubi (Iraq)**

<b>General information:</b>	
<b>Species:</b>	Cattle
<b>Most common name (language abbreviation in brackets):</b>	Jenubi (Eng.)
<b>Other local names (language abbreviation in brackets):</b>	Fao, Ma'amir, Zubairi, Genbi, Janoubi (Arabic)
<b>Taxonomic classifications:</b>	Variety
<b>Current domestication status:</b>	domestic
<b>Country:</b>	Iraq
<b>Main location of breed within country:</b>	South eastern and central Iraq
<b>Main use:</b>	milk
<b>Risk status:</b>	-
<b>Population:</b>	
<b>Year of data collection:</b>	1986
<b>The number of females is:</b>	decreasing
<b>Number of males in AI service:</b>	0
<b>Morphology:</b>	
<b>Adult live weight males (average, Kg):</b>	325
<b>Adult live weight females (average, Kg):</b>	309
<b>Adult wither height males (average, cm):</b>	125
<b>Adult wither height females (average, cm):</b>	123
<b>Colour:</b> uni coloured: usually red (golden to bright bay) multicoloured: sometimes pied	
<b>Specific visible traits:</b> Zebu, resemble Sahiwal	
<b>Number of horns (male):</b>	2
<b>Number of horns (female):</b>	2
<b>Horn shape:</b>	Moderate sized or quite small horns
<b>Origin of breed:</b>	
Variety of Iraqi	
<b>Special qualities of breed:</b>	
No data available	
<b>Performance:</b>	

<b>Birth weight male (kg):</b>	<b>21.8</b>
<b>Birth weight female (kg):</b>	<b>20.7</b>
<b>Milk yield per lactation (kg):</b>	<b>1400</b>
<b>Lactation length (day):</b>	<b>240</b>
<b>Milk fat (%):</b>	<b>4.1</b>
<b>Daily gain (g):</b>	<b>557</b>
<b>Additional information:</b> - feed conversion ratio 7.6 kg/kg; - mortality rate until weaning 6%;	
<b>In-situ conservation and ex-situ preservation:</b>	
<b>Cryo-preservation semen (number of sires represented):</b>	<b>0</b>
<b>Cryo- preservation embryos:</b>	<b>no</b>
<b>Source of information:</b>	

## Chart 2 Kurdi (Iraq)

<b>General information:</b>	
<b>Species:</b>	Cattle
<b>Most common name (language abbreviation in brackets):</b>	Kurdi (Eng.)
<b>Other local names (language abbreviation in brackets):</b>	Karadi (Arabic)
<b>Taxonomic classifications:</b>	Breed
<b>Current domestication status:</b>	domestic
<b>Country:</b>	Iraq
<b>Main use:</b>	meat
<b>Population:</b>	
No data available	
<b>Morphology:</b>	
<b>Adult live weight males (average, Kg):</b>	300
<b>Adult live weight females (average, Kg):</b>	220
<b>Adult wither height females (average, cm):</b>	106
<b>Colour: coloured: black often with light markings</b>	
<b>Number of horns (male):</b>	2
<b>Number of horns (female):</b>	2
<b>Origin of breed:</b>	
Brachyceros type	
<b>Special qualities of breed:</b>	
No data available	
<b>Performance:</b>	
<b>Birth weight male (Kg):</b>	14.5
<b>Birth weight female (Kg):</b>	14.5
<b>Milk yield per lactation (Kg):</b>	161
<b>Lactation length (day):</b>	74
<b>Milk fat (%):</b>	4.8
<b>Daily gain (g):</b>	379
<b>Additional information:</b>	
The lactation period is quite short and was measured from cattle milked by hand (removing all milk from the udder each time). -feed conversion ratio 12.68 kg/kg; - weaning weight 82.8 kg;	
<b>In-situ conservation and ex-situ preservation:</b>	
<b>Cryo-preservation semen (number of sires represented):</b>	0
<b>Cryo-preservation embryos:</b>	no
<b>Source of information:</b> Domestic Animal Diversity System, FAO.	

**Chart 3**  
**Domestic Animal Diversity**  
**Information System**  


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**Sharabi (Iraq)**

<b>General information:</b>	
<b>Species:</b>	Cattle
<b>Most common name (language abbreviation in brackets):</b>	Sharabi (Eng.)
<b>Taxonomic classifications:</b>	Variety
<b>Current domestication status:</b>	domestic
<b>Country:</b>	Iraq
<b>Main location of breed within country:</b>	Tigris Valley, North of Mosul
<b>Risk status:</b>	-
<b>Population:</b>	
<b>Year of data collection:</b>	1986
<b>The number of females is:</b>	stable
<b>Number of males in AI service:</b>	0
<b>Morphology:</b>	
<b>Adult live weight males (average, kg):</b>	400
<b>Adult live weight females (average, kg):</b>	295
<b>Adult wither height females (average, cm):</b>	119
<b>Colour:</b>	
uni coloured: black colour sided	
<b>Specific visible traits:</b>	
small hump in males	
<b>Number of horns (male):</b>	2
<b>Number of horns (female):</b>	2
<b>Origin of breed:</b>	
Variety of Iraqi	
<b>Special qualities of breed:</b>	
No data available	
<b>Performance:</b>	
<b>Birth weight male (kg):</b>	19.98
<b>Birth weight female (kg):</b>	18.5
<b>Milk yield per lactation (kg):</b>	1140
<b>Lactation length (day):</b>	197
<b>Milk fat (%):</b>	4

<b>Daily gain (g):</b>	<b>633</b>
<b>Additional information:</b>	
<p>- service period 82.3 - 130 days; - number of services per conception 1.74 - 1.83 - feed conversion ratio 8.28 kg/kg; - mortality rate until weaning 5.3%;</p>	
<b>In-situ conservation and ex-situ preservation:</b>	
<b>Cryo-preservation semen (number of sires represented):</b>	<b>0</b>
<b>Cryo- preservation embryos:</b>	<b>no</b>
<b>Source of information:</b>	

## Chart 4 Rustaqi (Iraq)

<b>General information:</b>	
<b>Species:</b>	Cattle
<b>Most common name (language abbreviation in brackets):</b>	Rustaqi (Eng.)
<b>Other local names (language abbreviation in brackets):</b>	Restaqi (Arabic)
<b>Taxonomic classifications:</b>	Variety
<b>Current domestication status:</b>	domestic
<b>Country:</b>	Iraq
<b>Main location of breed within country:</b>	Around Hillah and Bagdad Regions
<b>Risk status:</b>	Not at risk
<b>Population:</b>	
<b>Year of data collection:</b>	1986
<b>The number of females is:</b>	stable
<b>Number of males in AI service:</b>	0
<b>Morphology:</b>	
<b>Adult live weight males (average, Kg):</b>	450
<b>Adult live weight females (average, Kg):</b>	400
<b>Colour: uni coloured: brown, light tan</b>	
<b>Number of horns (male):</b>	2
<b>Number of horns (female):</b>	2
<b>Origin of breed:</b>	
Improved variety of Iraq, descended from Jenubi with some influence from Red Sindhi.	
<b>Special qualities of breed:</b>	
No data available	
<b>Performance:</b>	
<b>Milk yield per lactation (Kg):</b>	1200
<b>Lactation length (day):</b>	210
<b>Daily gain (g):</b>	688
<b>Additional information:</b>	
- feed conversion ratio 7.39 - 8.45 kg/kg;	
<b>In-situ conservation and ex-situ preservation:</b>	
<b>Cryo-preservation semen (number of sires represented):</b>	0
<b>Cryo-preservation embryos:</b>	no
<b>Source of information:</b> Domestic Animal Diversity System / FAO.	

**Chart 5**  
**Domestic Animal Diversity**  
**Information System**  


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**Iraqi (eng.) (Iraq)**

<b>General information:</b>			
<b>Species:</b>	Buffalo		
<b>Most common name (language abbreviation in brackets):</b>	Iraqi (Eng.)		
<b>Other local names (language abbreviation in brackets):</b>	Dwab (Arabic)		
<b>:Taxonomic classifications</b>	Breed		
<b>:Current domestication status</b>	Domestic		
<b>:Country</b>	Iraq		
<b>:Main location of breed within country</b>	South eastern and northern Iraq		
<b>:Main use</b>	milk		
<b>:Risk status</b>	Not at risk		
<b>:Population</b>			
<b>:Year of data collection</b>	1986	1987	1990
<b>:Total population size</b>	141483		
<b>:Total number of breeding females</b>	116000		
<b>:Total number of males used for breeding</b>	25000		
<b>:The number of females is</b>	stable		
<b>Percentage of females being bred pure (mated to males of own breed)</b>	100		
<b>:Number of in AI service</b>	0		
<b>:Morphology</b>			
<b>:Adult live weight males (average, Kg)</b>	950		
<b>:Adult live weight females (average, Kg)</b>	900		
<b>:Adult wither height males (average, cm)</b>	152		
<b>:Adult wither height females (average, cm)</b>	148		
<b>:Colour</b>			
<p style="text-align: center;">uni coloured: black or dark grey, often with white on head, feet and tail  multicoloured  occasionally pied. comment: black (larger) variety and grey (smaller) variety</p>			
<b>:Number of horns (male)</b>	2		
<b>Number of horns (male):</b>	2		
<b>:Number of horns (female)</b>	Sickle shaped horns		
<b>:Horn shape</b>			
<b>:Origin of breed</b>			

<b>Iraqi buffalo may be divided into two groups Marsh or Al-Ahwar and river buffaloes.</b>	
<b>:Special qualities of breed</b>	
No data available	
<b>:Management conditions</b>	
<b>:Mobility</b>	Stationary
<b>:Feeding of adults</b>	Fodder grazing
The animals were housed from 6 to 12 months per year	
<b>Performance:</b>	
<b>Birth weight male (kg):</b>	<b>40</b>
<b>:Birth weight female (kg)</b>	<b>39</b>
<b>Milk yield per lactation (Kg):</b>	<b>1550</b>
<b>:Lactation length (day)</b>	<b>240</b>
<b>:Milk fat (%)</b>	6.75
<b>:Additional information</b>	
River buffalo are larger and produce more milk than the Al-Ahwar buffalo.	
<b>:In-situ conservation and ex-situ preservation</b>	
<b>Cryo-preservation semen (number of sires represented)</b>	<b>0</b>
<b>Cryo-preservation embryos:</b>	<b>no</b>

**Chart 6**  
**Domestic Animal Diversity**  
**Information System**

<b>General Information:</b>		
<b>Species:</b>	<b>Ovine / sheep</b>	
<b>Most common name( language abbreviation in brackets):</b>	<b>Awassi (Eng.)</b>	
<b>Other local names ( language abbreviation in brackets):</b>	<b>Aussi (Arabic)</b>	
<b>Taxonomic classifications:</b>	<b>Breed</b>	
<b>Current domestication status:</b>	<b>Domestic</b>	
<b>Country:</b>	<b>IRAQ</b>	
<b>Main location of breed within country:</b>	<b>Central-West central and Jazira</b>	
<b>Main use:</b>	<b>Meat and milk</b>	
<b>Risk status:</b>	<b>No risk</b>	
<b>Population:</b>		
<b>Year of data collection:</b>	<b>1999*</b>	
<b>Total population size:</b>	<b>3,492</b>	
<b>Total number of breeding females:</b>	<b>2,444</b>	
<b>Total number of males used for breeding:</b>	<b>0,1222</b>	
<b>The number of females is:</b>	<b>3,370</b>	
<b>Percentage of females being bred pure (mated to males of own breed):</b>	<b>95%</b>	<b>95%</b>
<b>Number of males in AI service:</b>	<b>NIL</b>	<b>NIL</b>
<b>Morphology:</b>		
<b>Adult live weight males (average, kg):</b>	<b>63 Kg</b>	
<b>Adult live weight females (average, kg):</b>	<b>46 Kg</b>	
<b>Adult wither height males (average, cm):</b>	<b>74 cm</b>	
<b>Adult wither height females (average, cm):</b>	<b>69 cm</b>	
<b>Colour: Predominantly white with brown or black faces</b>		
<b>Number of horns(male):</b>	<b>2</b>	
<b>Number of horns(female):</b>	<b>Non</b>	
<b>Horn shape:</b>	<b>Long spiral horns</b>	
<b>Origin of breed:</b>		
<b>Native Iraqi</b>		
<b>Special qualities of breed:</b>		
<b>Fat tailed-Palatable meat:</b>		
<b>Management conditions:</b>		
<b>Mobility:</b>	<b>Ability to move long distance</b>	

<b>Feeding of adults:</b>	<b>Mainly grazing</b>
<b>Performance:</b>	
<b>Birth weight male (kg):</b>	<b>4,5 Kg</b>
<b>Birth weight female (kg):</b>	<b>4,1 Kg</b>
<b>Milk yield per lactation (kg):</b>	<b>134</b>
<b>Lactation length (day):</b>	<b>131</b>
<b>Milk fat (%):</b>	<b>5-5,5 %</b>
<b>Additional information:</b> Highest daily gain in weight was 285 g.	<b>Hardy ; resistant to most of endemic disease; withstand harsh environment</b>
<b>In-situ conservation and ex-situ preservation:</b>	
<b>Cryo-preservation semen (number of sires represented):</b>	<b>No</b>
<b>Cryo-preservation embryos:</b>	<b>No</b>
<b>Source of information:</b>	
<b>Alkass, J.E. and K.H. Juma. 2002 . Small ruminant breeds of Iraq. ICARDA, Syria.</b>	

\* FAO estimates

**Chart 7**  
**Domestic Animal Diversity**  
**Information System**

<b>General Information:</b>		
<b>Species:</b>	<b>Sheep</b>	
<b>Most common name( language abbreviation in brackets):</b>	<b>Arabi (Eng.)</b>	
<b>Other local names ( language abbreviation in brackets):</b>	<b>(Arabic)</b>	
<b>Taxonomic classifications:</b>	<b>Breed</b>	
<b>Current domestication status:</b>	<b>Domestic</b>	
<b>Country:</b>	<b>IRAQ</b>	
<b>Main location of breed within country:</b>	<b>Southern desert</b>	
<b>Main use:</b>	<b>Meat and milk</b>	
<b>Risk status:</b>	<b>No risk</b>	
<b>Population:</b>		
<b>Year of data collection:</b>	<b>1999*</b>	
<b>Total population size:</b>	<b>1,308</b>	
<b>Total number of breeding females:</b>	<b>0,915</b>	
<b>Total number of males used for breeding:</b>	<b>0,045</b>	
<b>The number of females is:</b>	<b>1,263</b>	
<b>Percentage of females being bred pure (mated to males of own breed):</b>	<b>95 %</b>	<b>95 %</b>
<b>Number of males in AI service:</b>	<b>NIL</b>	<b>NIL</b>
<b>Morphology:</b>		
<b>Adult live weight males (average, kg):</b>	<b>53</b>	
<b>Adult live weight females (average, kg):</b>	<b>38</b>	
<b>Adult wither height males (average, cm):</b>	<b>81</b>	
<b>Adult wither height females (average, cm):</b>	<b>72</b>	
<b>Colour: Predominantly white with brown or black faces</b>		
<b>Number of horns(male): Some have 2 horns and the majority polled</b>		
<b>Number of horns(female):</b>	<b>Polled</b>	
<b>Horn shape:</b>	<b>Long spiral horns</b>	
<b>Origin of breed:</b>		
<b>Native Iraqi</b>		
<b>Special qualities of breed: Adapted well to harsh environment</b>		
<b>Management conditions:</b>		
<b>Mobility:</b>	<b>Ability to move long distance</b>	
<b>Feeding of adults:</b>	<b>Mainly grazing</b>	

<b>Performance:</b>	
<b>Birth weight male (kg):</b>	<b>4,4</b>
<b>Birth weight female (kg):</b>	<b>4,0</b>
<b>Milk yield per lactation (kg):</b>	<b>55</b>
<b>Lactation length (day):</b>	<b>87 (weaning)</b>
<b>Milk fat (%):</b>	<b>5,8</b>
<b>Additional information:</b> Hardy , resistant to most of endemic diseases , with stand harsh environment	<b>Adapted well to desert conditions</b>
<b>In-situ conservation and ex-situ preservation:</b>	
<b>Cryo-preservation semen (number of sires represented):</b>	<b>No</b>
<b>Cryo-preservation embryos:</b>	<b>No</b>
<b>Source of information:</b>	
<b>Alkass, J.E. and K.H. Juma. 2002 . Small ruminant breeds of Iraq. ICARDA , Syria.</b>	

\* FAO estimates

**Chart 8**  
**Domestic Animal Diversity**  
**Information System**

<b>General Information:</b>		
<b>Species:</b>	<b>Sheep</b>	
<b>Most common name( language abbreviation in brackets):</b>	<b>Karadi (Eng.)</b>	
<b>Other local names ( language abbreviation in brackets):</b>	<b>(Arabic)</b>	
<b>Taxonomic classifications:</b>	<b>Breed</b>	
<b>Current domestication status:</b>	<b>Domestic</b>	
<b>Country:</b>	<b>IRAQ</b>	
<b>Main location of breed within country:</b>	<b>North</b>	
<b>Main use:</b>	<b>Meat and milk</b>	
<b>Risk status:</b>	<b>No risk</b>	
<b>Population:</b>		
<b>Year of data collection:</b>	<b>1999*</b>	
<b>Total population size:</b>	<b>1,200,000</b>	<b>(including Hamdani)</b>
<b>Total number of breeding females:</b>	<b>0,840</b>	
<b>Total number of males used for breeding:</b>	<b>0,042</b>	
<b>The number of females is:</b>	<b>1,158</b>	
<b>Percentage of females being bred pure (mated to males of own breed):</b>	<b>95%</b>	<b>95%</b>
<b>Number of males in AI service:</b>	<b>NIL</b>	<b>NIL</b>
<b>Morphology:</b>		
<b>Adult live weight males (average, kg):</b>	<b>50</b>	
<b>Adult live weight females (average, kg):</b>	<b>42</b>	
<b>Adult wither height males (average, cm):</b>	<b>69</b>	
<b>Adult wither height females (average, cm):</b>	<b>65</b>	
<b>Colour: Karadi sheep are white with black convex open face. The black colour often extends to the shoulders and some other parts of the body.</b>		
<b>Number of horns(male):</b>	<b>Polled</b>	
<b>Number of horns(female):</b>	<b>Polled</b>	
<b>Horn shape:</b>		
<b>Origin of breed:</b>		
<b>Native Iraqi</b>		
<b>Special qualities of breed:</b>		
<b>Hardy to mountains region</b>		

<b>Management conditions:</b>	
<b>Mobility:</b>	
<b>Feeding of adults:</b>	<b>Maninly grazing</b>
<b>Performance:</b>	
<b>Birth weight male (kg):</b>	<b>4,3</b>
<b>Birth weight female (kg):</b>	<b>4,0</b>
<b>Milk yield per lactation (kg):</b>	<b>77,0</b>
<b>Lactation length (day):</b>	<b>142,0</b>
<b>Milk fat (%):</b>	<b>7,25</b>
<b>Additional information:</b> Hardy , resistant to most of endemic diseases , with stand harsh conditions	
<b>In-situ conservation and ex-situ preservation:</b>	
<b>Cryo-preservation semen (number of sires represented):</b>	<b>No</b>
<b>Cryo-preservation embryos:</b>	<b>No</b>
<b>Source of information:</b>	
<b>Alkass, J.E. and K.H. Juma. 2002 . Small ruminant breeds of Iraq. ICARDA, Syria.</b>	

**Chart 9**  
**Domestic Animal Diversity**  
**Information System**

<b>General Information:</b>		
<b>Species:</b>	<b>Sheep</b>	
<b>Most common name( language abbreviation in brackets):</b>	<b>Hamdani (Eng.)</b>	
<b>Other local names ( language abbreviation in brackets):</b>	<b>(Arabic)</b>	
<b>Taxonomic classifications:</b>	<b>Variety of Karadi</b>	
<b>Current domestication status:</b>	<b>Domestic</b>	
<b>Country:</b>	<b>IRAQ</b>	
<b>Main location of breed within country:</b>	<b>North , Erbil Plain</b>	
<b>Main use:</b>	<b>Meat and milk</b>	
<b>Risk status:</b>	<b>No risk</b>	
<b>Population:</b>		
<b>Year of data collection:</b>	<b>1999</b>	
<b>Total population size:</b>	<b>Estimated within karadi</b>	
<b>Total number of breeding females:</b>		
<b>Total number of males used for breeding:</b>		
<b>The number of females is:</b>		
<b>Percentage of females being bred pure (mated to males of own breed):</b>	<b>95%</b>	<b>95%</b>
<b>Number of males in AI service:</b>	<b>NIL</b>	<b>NIL</b>
<b>Morphology:</b>		
<b>Adult live weight males (average, kg):</b>	<b>80,0</b>	
<b>Adult live weight females (average, kg):</b>	<b>65,0</b>	
<b>Adult wither height males (average, cm):</b>	<b>80,0</b>	
<b>Adult wither height females (average, cm):</b>	<b>67,0</b>	
<b>Colour: The body is usually white with long black fine boned head</b>		
<b>Number of horns(male):</b>	<b>Polled</b>	
<b>Number of horns(female):</b>	<b>Polled</b>	
<b>Horn shape:</b>	<b>Polled</b>	
<b>Origin of breed:</b>		
<b>Sub-breed or strain of native Iraqi Karadi</b>		
<b>Special qualities of breed: The largest of Iraqi breed</b>		
<b>Management conditions:</b>		
<b>Mobility:</b>		

<b>Performance:</b>	
<b>Birth weight male (kg):</b>	<b>4,95</b>
<b>Birth weight female (kg):</b>	<b>4,64</b>
<b>Milk yield per lactation (kg):</b>	<b>96</b>
<b>Lactation length (day):</b>	<b>144</b>
<b>Milk fat (%):</b>	<b>7,0</b>
<b>Additional information:</b> Hardy , resistant to most of endemic diseases It is the largest breed in the country.	
<b>In-situ conservation and ex-situ preservation:</b>	
<b>Cryo-preservation semen (number of sires represented):</b>	<b>No</b>
<b>Cryo-preservation embryos:</b>	<b>No</b>
<b>Source of information:</b>	
<b>Alkass, J-E. and K.H. Juma. 2002 . Small ruminant breeds of Iraq. ICARDA, Syria.</b>	

**Chart 10**  
**Domestic Animal Diversity**  
**Information System**

<b>General Information:</b>			
<b>Species:</b>	Goat		
<b>Most common name( language abbreviation in brackets):</b>	Native goat (Eng.)		
<b>Other local names ( language abbreviation in brackets):</b>	(Arabic)		
<b>Taxonomic classifications:</b>			
<b>Current domestication status:</b>	Breed		
<b>Country:</b>	IRAQ		
<b>Main location of breed within country:</b>	All over the country		
<b>Main use:</b>	Milk and meat		
<b>Risk status:</b>	No risk		
<b>Population:</b>			
<b>Year of data collection:</b>	1999		
<b>Total population size:</b>	1,300,000		
<b>Total number of breeding females:</b>	0,910		
<b>Total number of males used for breeding:</b>	0,045		
<b>The number of females is:</b>	1,255		
<b>Percentage of females being bred pure (mated to males of own breed):</b>			
<b>Number of males in AI service:</b>	NIL		
<b>Morphology:</b>			
<b>Adult live weight males (average, kg):</b>	50,0		
<b>Adult live weight females (average, kg):</b>	39,0		
<b>Adult wither height males (average, cm):</b>	74,0		
<b>Adult wither height females (average, cm):</b>	67,0		
<b>Colour: Usually has white marks on the ears and often also on head or legs. Very occasionally pied or all white , brown , grey or black individuals occur.</b>			
<b>Number of horns(male): Some have 2 horns and the majority polled</b>	2		
<b>Number of horns(female):</b>	Polled		
<b>Horn shape:</b>	Long		
<b>Origin of breed:</b>			
Native Iraqi			
<b>Special qualities of breed: Adapted well to harsh environment</b>			

<b>Management conditions:</b>	
<b>Mobility:</b>	<b>Ability to move long distance</b>
<b>Feeding of adults:</b>	<b>Mainly grazing</b>
<b>Performance:</b>	
<b>Birth weight male (kg):</b>	<b>3,0</b>
<b>Birth weight female (kg):</b>	<b>2,8</b>
<b>Milk yield per lactation (kg):</b>	<b>98,0</b>
<b>Lactation length (day):</b>	<b>173</b>
<b>Milk fat (%):</b>	<b>3,30</b>
<b>Additional information:</b> Hardy , resistant to most of endemic diseases , with stand harsh environment	
<b>In-situ conservation and ex-situ preservation:</b>	
<b>Cryo-preservation semen (number of sires represented):</b>	<b>NIL</b>
<b>Cryo-preservation embryos:</b>	<b>NIL</b>
<b>Source of information:</b>	
<b>Alkass, J-E. and K.H. Juma. 2002 . Small ruminant breeds of Iraq. ICARDA, Syria.</b>	

## **- Chicken:**

### **Local breed:**

Iraqi local breed of chickens is of the wild type, “gallus domesticus banciva”.

Out of this breed, six sub-strains were selected to run as pure lines by IPA Agriculture Research Center. Those were characterized and reported by the “World Watch List-for domestic animal diversity (3<sup>rd</sup> edition) and as below: **They were derived according to plumage colour.**

#### **1. Abaeth**

Local names or synonyms: White Native Iraqi

Population data: 575-500 F. M75 – 1994

Population trend: stable

Range of uses: research

#### **2. Bunni**

: Brown Native Iraqi

: F575-500. M75 - 1994

: stable

: research

#### **3. Mukhatat**

: Barred Native Iraqi

: F575 – 500. M75 - 1994

: stable

: Research

#### **4. Arree EL-Rakaba Abaeth**

: Abaeth Neched Neck Iraqi

: F230 – 200. M30 - 1994

: Increasing

: Research

#### **5. Arree EL-Rakaba Bunni**

: Brown Naked Neck Iraqi

: F230 – 200. M30 - 1994

: stable

: Research

#### **6. Asswad**

: Black Native Iraqi

: F575 – 500. M75 - 1994

: stable

: Research

Though all characterized as (endangered), one should know that the population is purposely restricted to this size. Table (a) contain some of the morphological traits of indigenous Iraqi chickens and table (b) some selected traits of production and reproduction. This table also

included Leghorn and Newhampshire which were well adapted to Iraqi environment and could be categorized as indigenous.

**Table a: Morphological characteristics of indigenous Iraqi chicken (Prevalence)**

	<b>Bunni BR</b>	<b>Barred BA</b>	<b>Black BL</b>	<b>White Necked neck WN</b>	<b>White WT</b>	<b>Brown Necked neck</b>
<b>Plumage Pattern</b>	98% self- red	Barred 100%	98% self black	90% self- white	98% self- white	90% self- white
<b>Skin cataur</b>	100%	white	100%	100% white	100%	100%
<b>Skank andfoat colour</b>	white 90%	90% yellow	yellow 70%	80% yellow 90% single	white 90%	white 20% white
<b>Comb type</b>	yellow	100%	black	100% white	yellow	90% single
<b>Egg shell colour</b>	100 single 100 tinted	single 100% tinted	100% single 100% tinted		100% single 90% white	100% brown

\* Source: characteristics of indigenous chicken in Iraq  
A. A. AL-Rawi  
A. K. AL-Athari

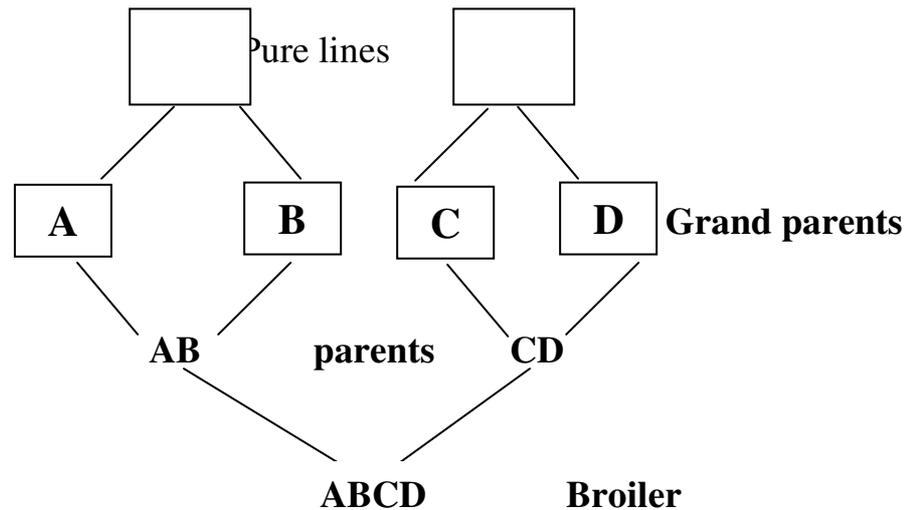
**Table b: Selected traits of indigenous Iraqi chicken**

<b>Trait</b>	<b>BR</b>	<b>BA</b>	<b>BL</b>	<b>WN</b>	<b>WT</b>	<b>LG</b>	<b>NH</b>
Age at sexual maturity (day)	161.7	165.4	162.3	165.4	163.4	162.2	165.9
Body weight at sexual maturity (gm)	1342.8	1385.4	1457.6	1333.4	1439.4	1400.9	1685.3
Egg production	175.1	162.2	156.5	147.0	156.5	181.5	165.4
Average egg weight (gm)	54.1	53.3	52.5	54.9	52.9	55.9	54.3
Egg weight (37 weeks)	51.1	51.3	49.0	51.1	52.4	57.5	55.9
Feed efficiency (gm feed/egg)	196.2	221.0	209.3	232.2	211.7	183.6	212.6
Fertility (%)	75.8	85.7	85.0	90.0	94.0	77.3	90.0
Hatchability of fertilized egg (%)	95.5	75.3	96.0	86.1	88.0	89.8	92.5
Hatchability of egg set (%)	75.1	87.9	82.0	70.2	83.0	69.4	82.6
Egg mass (gm/hen)	6088.4	6185.0	5954.1	5533.0	565.2	7414.9	7384.9

Source: characteristics of indigenous chicken in Iraq  
A. A. AL-Rawi, A. K. AL-Athani  
IPA sqrie Res. Center-Iraqi  
LG: Lenghorn  
NH: Newhampshire

### **IPA (Fao-bro) developed breed:**

IPA Agriculture Research Center developed Fao-bro in 4 distinct pure lines that put to service for the last 10 years or more. It is the only pure line that is used to produce different crosses as grand parent and parent stock according to purpose. The 4 pure lines were designated A, B, C and D. The comercial hybrid is produced according to the following scheme. Table (c) contain some of the characterization of Fao bro.



The CD now is crossed with indigenous stock and with Leghorn and New Hampshire to produce a dual purpose stock for household production.

**Table c: Some characterization of Faobro (IPA):**

<b>Production Index (8 wk)</b>	<b>149.20</b>
<b>Viability % (8 wks)</b>	<b>94.62</b>
<b>Feed conversion ratio (8 wk)</b>	<b>2.29</b>
<b>(Adjusted for mortality)</b>	
<b>Dressing %</b>	
<b>males</b>	<b>78.90</b>
<b>females</b>	<b>79.65</b>
<b>Fertility %</b>	<b>94.04</b>
<b>Hatchability %</b>	<b>84.73</b>
<b>Embryo mortality (1<sup>st</sup> wk)</b>	<b>25 %</b>
<b>(3rd wk)</b>	<b>23 %</b>
<b>Average body weight (8 wks)</b>	
<b>males</b>	<b>2211.33</b>
<b>females</b>	<b>1843.67</b>

**Source: Abstracted from**

**Random Sample Test for imported and Fao-Bro 1 Broiler hybrids.**

**A. H. Mohammed, N. M. A. Sulieman, I. K. Ibrahim**

### **The Harati Local breed:**

It is a local heavy breed stock, usually raised for games (cock fight), mainly in rural area. Its number is diminishing and could be described as (endangered). It was not studied and its attributes are not reported.

## **Chapter 4**

### **State of benefits from Animal Genetic Resources**

It is clear from table (4-1) that cattle and buffaloes are mainly raised for milk production then meat; while sheep and goats are mainly for meat production followed by milk. Camels are for transportation in deserts, with a noticeable importance as meat producers specially in the western region of Iraq. Poultry has nearly equal importance in egg and meat production. Goose, ducks and turkeys are mainly kept for meat.

Table (4-2) shows the relative importance of species according to animal products. Chicken produces nearly half of the meat and nearly 100% of eggs consumed. Cattle are the main milk producers. Skins are mainly of sheep and goats; they are largely exported. Cattle hides usually tanned and locally consumed by leather industry.

The animal breeds used in breeding and production are mainly local; selection and crossing are the main two strategies, though selection is very mild and is not followed as a long term policy (Table 4-3).

AI is mainly used in cattle to produce crossbred of local x Friesian, to improve milk production. Crossbreeding of sheep is for improving meat production, and only on experimental scale.

Adoption of technologies and advanced methodologies in breeding strategies is only practiced in research centers and only on limited scale (Table 4-5).

The role of responsible offices in the adoption and use of animal improvement methodologies is limited and restricted to governmental and research and university centers. Private sector and animal societies contribute nothing to this aim, (Table 4-6). The same picture can be seen when considering the contribution of related bodies in animal improvement activities. Though of low contribution, the government and research centers and universities, are the only major contributors, (Table 4-7).

The preference of related bodies to animal improvement, centers round the breeds that are adapted to local environment and those imported from outside the country, table (4-8).

The situation of animal resources and level of production needs a set of actions starting from recording, genetic evaluation, use of A.I. and E.T. to the molecular methods of improvement and genetic engineering. To bring these methodologies into action, Iraq needs intensive training programs and knowledge in addition to finance and active farmer's organizations for proper implementation, (Table 4-9).

Availability of feed is a limiting factor to all improvement programs and activities.

**Table (4 – 1): Relative importance of Animal Products and services by species (100%)**

Species	Dairy	meat	Eggs	Fiber	Skin casing	Risk management	Fertilizer	Working power	Educational Research	recreating	Fuel	Feather	Environment management	Total
<b>Cattle</b>	70	28			1		1							100
<b>Buffalo</b>	50	40			8		2							100
<b>Sheep</b>	20	65		8	5		2							100
<b>Goat</b>	35	55		2	6		2							100
<b>Camel</b>	10	70		2	5			13						100
<b>Lama</b>	-													
<b>Horses</b>	-							15	85					100
<b>Donkys</b>	-							100						100
<b>Pigs</b>	-													
<b>Poultry</b>	-	48	50				1.5					0.5		100
<b>Turkey</b>	-	100												
<b>Goose</b>	-	90	8									2		100
<b>Ducks</b>	-	90	9									1		100
<b>Rabbit</b>	-	10							90					100

**Table (4 – 2): Relative importance of species according to Animal Product and service(100%)**

Species	meat	milk	eggs	Skin casing	Wool hair	Fertilizer	Working power	Feather	Educational Research	management				
<b>Cattle</b>	19.8	52.8		15.0		15.0			5.0					
<b>Buffalo</b>	2.3	11.9		1.0		5.0								
<b>Sheep</b>	13.4	20.4		44.0	90.0	45.0			25.0					
<b>Goat</b>	5.7	13.6		40.0	10.0	30.0			5.0					
<b>Camel</b>	1.2	1.3		1.0			10.0							
<b>Lama</b>														
<b>Horses</b>							5.0							
<b>Donkys</b>							85.0							
<b>Pigs</b>														
<b>Poultry</b>	57.6		98.0			5.0		100	50.0					
<b>Turkey</b>														
<b>Goose</b>			1.0											
<b>Ducks</b>			1.0											
<b>Rabbit</b>														

**Table (4 – 3): Number of breeds widely used in breeding strategies (No. of breeds)**

Species	Totale No. breed	Breeding strategies		
		Slection	Crossing	Selection and Crossi
Cattle	5	1	1	
Buffalo	1			
Sheep	4	1	1	
Goat	2		1	
Camel	1			
Lama				
Horses	1			
Donkys				
Pigs				
Poultry	11	11	1	1
Turkey				
Goose				
Ducks				
Rabbit				

**Table (4 – 4): Number of breeds used in current breeding strategies on a large scale**

Species	Breeding Strategies			Stools ysed				
	Breedin objectiv	design	Design and		recording	A.I.	Embryo Transfer	Genetic evaluation
Cattle	3					3		1
Buffalo								
Sheep	3							
Goat	2							
Camel								
Lama								
Horses								
Donkys								
Pigs								
Poultry	4							2
Turkey								
Goose								
Ducks								
Rabbit								

**Table (4 – 5): Technologies and advanced methodologies used in breeding strategies**

Technologies and Methodologies	Used by	
	Research centers	Farmers
Construction of slection index for multiple characters	%5	0
Methods of finding Proper method of breeding	%25	0
Data base for recording	0	0
Computer program for gentic evaluation	%1	0
Reproduction technologies (AI, ET, etc)	%15	%5
Genetic Linkage maps for gene identification by ma	0	0
Other technologies	%1	0

**Table (4 – 6): Role of responsible offices in use of methodologies used in animal improvement**

Office	Breeding strategies	Individual identification	Recording	A.I.	Gevetic evaluation
Central government	3	1	1	3	1
State government	N.A	N.A	N.A	N.A	N.A
Local government	=	=	=	=	=
Animal societies	0	1	1	1	1
Private companies	0	1	1	1	1
Research centers universities	3	1	1	2	3

**Table (4 – 7): Contribution of related bodies in animal improvement activities**

Related bodies	Legalization	Breeding	Structure	human	farmer
Central government	3	2	1	2	2
State government					
Local government					
Breeding societies	1	1	1	1	1
Private companies	1	2	2	2	1
Research centers universities	1	3	1	2	1

**Table (4 – 8): Preference of related bodies to animal resources**

Related bodies	Breeds adapted To local envionment	Imported Breeds from within	Forighn Imported breeds
Central government	3	-	3
State government			
Local government			
Breeding societies	1	1	1
Private companies	1	1	4
Research centers universities	3	1	3

**Table (4 – 9): Priority of inputs necessary for use of technologies in animal improvemnt**

Technology	Requirements			
	knowledge	Training	Finicial Resources	Farmers Organization
Recording	4	5	5	4
Genetic evaluation	5	5	5	3
A.I. / E.T.	5	5	5	4
Molecular methods	5	5	5	1
Breed organizing method	5	5	5	2

# Chapter 5

## State of Genetic Animal Resources

### - Conservation and Incentives:

Table (5-1) shows the number of breeds under conservation. Services presented to protect animals and help in conservation are practiced in the animals natural habitats. such services mainly include veterinary vaccination programs and A. I.

No conservation management is purposely offered to animals outside the natural habitat, (Table 5-1 ; 5-2).

Incentives are not presented for the purpose of conservation but as a temporary measure in draughty seasons and to protect health and production. Such incentives are mainly presented by the government represented by the Ministry of Agriculture, (Table 5-3). The level of such measures when offered by the government, is acceptable , but it is of low standard when offered by other concerned bodies. Research centers and universities help in studying the state of animal welfare and suggest methods and routes for protection and improvement, but implementation of such suggestions is very rare. Weak extension services is one of the reasons of such lag between research and implementation. (Table 5-4).

**Table (5-1): The current number of breeds under onservation**

Species	Total	No. breeds endangered		
		*Management in nataral habitat	Management outside natural habitat	Managanent inside and out side natural habitat
Cattle	4	4	-	-
Buffalo	1	1	-	-
Sheep	4	4	-	-
Goat	2	2	-	-
Camel	1	1	-	-
Lama	1	1	-	-
Horses	1	1	-	-
Donkeys	1	1	-	-
Pigs			-	-
Poultry	1	1	-	-
Turkey			-	-
Goose			-	-
Ducks			-	-
Rabbit			-	-

\* Veterinary services , AI (when applicable) and feed supplementation during dry seasons (sometimes).

**Table (5 - 2): Number of breeds that get incentives to be used for preservation outside their natural habitat**

Species	Incentives			Tools used				
	Government	Non-Governmental	market	Semen storage	Embryo storage	DNA storage	In vivo	Surveillance
Cattle								
Buffalo								
Sheep								
Goat								
Camel								
Lama								
Horses								
Donkeys								
Pigs								
Polly								
Turkey								
Gooses								
Ducks								
Rabbit								

**None**

**Table (5-3): Number of breeds characterized**

Species	Incentives			Technical methods used				
	government	NGO	Marker	Private compose*	Recording	AI	ET	Other Vet. services
Cattle	3	-	-	-	-	3	-	5
Buffalo	2							2
Sheep	4							4
Goat	2							2
Camel	1							1
Lama								
Horses	1							1
Donkeys	1							1
Pigs								
Poultry	1							1
Turkey	1							1
Gooses	1							1
Ducks	1							1
Rabbit	1							

**Table (5-4): Contribution of concerned bodies in management of conservation programs.**

Concerned bodies	Consternation in natural habitat	Consternation outside natural habitats
Government	3	1
Farmer societies	1	1
Private companies	2	1
Researchcenters universities	4	1
NGO	1	1

**- Priority of needs to use technologies in preserving genetic resources in natural habitats:**

All required technologies that include and cover recording, genetic evaluation, molecular manipulation and breeding practices used by farmers need to be intensified. Knowledge and training of such methodologies are corner stones in implementation. Financial resources should be secured on stable bases. Selection for improvement and conservation technologies and practices should be done by specialists and with clear term of references (Table 5-5).

**Table (5-5): Priority of needs to use technologies in preserving genetic resources in natural habitats**

Technology	Requirements			
	Knowledge	Training	Financial Resources	Technology
<b>Recording</b>	4	5	5	5
<b>Genetic evaluation</b>	5	5	5	5
<b>Molecular methods</b>	5	5	5	5
<b>Breeding method applied by the farmers</b>	3	4	5	5

It should be noted that the government should establish a specialized office that can plan, and implement with the aim of conserving the genetic resources specially of local breeds and to use advanced methods in conserving the germ plasm.

# **Chapter 6**

## **State of policy and arrangements for management of genetic resources**

### **- Special Policies and Plans to develop animal Production:**

#### **a- Natural Pastures and production of Animal Feed:**

Range land, which accounts for a high percentage of the total land area, have been grazed continuously for millennia. However, the delicate agro-ecological balance that exists on ranges and natural pastures came under threat due to mis-management and heavy demand for land usage for cropping due to increased urbanization. The introduction of mechanized transport and agriculture machinery has resulted in destruction of natural land surfaces and loss of plantations.

The government introduced and implemented many measures, according to the available facilities for conservation, among these:

1. Protect and improve natural pastures through practical steps and instructions.
2. Increased the area of protected natural grazing.
3. Apply the system of rotational grazing  
The government implement Low number (2) for the 1983 year, after relaxing its application between 1992 – 1996.
4. Production of Animal feed even in the rain-fed and irrigated areas whenever possible.
5. Rid the natural pastures from poisonous and toxic plants.
6. Establishing Feed Reserves stores in all areas of natural pastures to meet some of the need.
7. Intensify veterinary services in areas of natural pastures.

#### **b- Cattle Production:**

1. National Program for dairy cattle improvement:

This is a 10 years program that aims at:

- Increase the activity of A. I. to achieve more than “1” million insemination in year 2005, and import 15 progeny tested Friesian bulls to help in the program.
- Importation of 10 thousand pure Friesian heifers to increase the available number for wider use.
- Introduce a kind of recording program for cattle to assist in applying improvement programs.

2. Control of endemic dangerous diseases such as:

Brucellosis, T. B., Theileriasis, FMD, mastitis... etc. in addition to the importation of different veterinary drugs and hormones.

**c- Sheep and goat production improvement programs:**

1. To continue applying crossbreeding between local Awassi and Turkush Awassi, Dmman and Assaf in research stations and the distribution of improved rams on small herd holders to improve their own. One of such projects is that which ran by the Ministry of Agriculture since the 80's to produce rams of genetic potentials to improve milk and meat production. IPA project of crossbreeding is one of the leading in the country if not the only one.
2. Complementing sheep production with the production of crops, specially in irrigated areas.
3. Supplementing sheep and goats with some barley during extreme shortage of natural pastures.
4. Increase the capacity of producing supplementary feed blocks from different agriculture and industrial byproducts that are fit for animal consumption in addition to urea.
5. Improve the quality of "tibben", which is the crushed stalks of barley and wheat, by urea treatment to increase protein content. Such technology, which is widely used in many countries, is still conducted on a narrow scale in Iraq.
6. Improve local goat postulation through crossing with selected "shami" breed to improve milk and meat production. Such program is still very limited to experimental purposes.

**d- Chicken production:**

Poultry industry collapsed completely after the 1991 war. The Ministry of Agriculture started a rehabilitation program for the whole poultry sector, both for egg and broiler production. In 1998, the clear results of this program, which was conducted in collaboration with the FAO-Iraq, reflected positively in the available egg and broiler meat in the market which is sold for consumers for a governmentally supported price.

Though most of the feed ingredients, specially concentrate, vitamins and minerals are imported, about 70% of corn and barley and other cereals are now locally produced.

The rehabilitation program which started with only 20 broiler production farms, 2 hatcheries and 2 slaughter houses reached a peak of 2100 farm, 1200 hatchery and 36 working slaughter houses at the end of 1999.

Meat production increased from 600-700 tons/month at the start to 9000 tons/month in 1999. Table egg production reached more than 600 million/year.

**- Governmental policies in developing and conserving animal resources:**

The government, represented by the Ministry of Agriculture, offers the essential services to protect and conserve animal resources and improve production.

**a- Artificial Insemination (A. I):**

A. I. Use is restricted to the Directorate of Animal Resources in collaboration with veterinary services and mainly conducted by private veterinary clinics.

Frozen and cooled semen usually produced centrally and distributed to users. The semen is produced from locally born Friesian bulls which are nearly performance tested but not progeny tested. No frozen semen is imported. This practice is used mainly to inseminate local cattle with Friesian semen to produce half cross or higher grades. Pure Friesian in the large scale dairy projects are also A. I.; (Table 6-1) shows A. I. activities.

**Table (6-1): A. I. activities from 1994 – 99**

Year	A. I. produced (1000 insemination)		
	Frozen	cooled	
1994	130	48	90
95	147	42	73
96	107	29	75
97	131	32	107
98	137	20	107
1999	157	11	88

Source: Reports of the Directorate of Animal Resources 1993 – 1999 Reports of the Directorate of veterinary services.

**b- Veterinary services:**

Veterinary services, specially in the control of diseases, offered through routine vaccination programs, for large animals (cattle and small ruminants) and chickens. Such services are offered freely or for nominal cost. Table (6-2) shows different veterinary activities for the years (1994 – 1999).

**Table (6-2): Veterinary services for the years (994 – 99), (in million)**

Activity	1994	1995	1996	1997	1998	1999
Large animal vaccination	1,4	13,4	11,4	14,0	16,3	2,7
Poultry vaccine	76,0	86,0	86,0	144,0	153,0	456,0
Treatments	20,0	32,0	26,3	22,0	40,1	36,8
Laboratory diagnosis	-	4,9	2,5	27,0	43,9	51,7

Source: Veterinary services – Annual reports 1994/1999

**- Effect of Policies and Legalization:**

Table (6-3) reflects the effect of legalization to use and develop animal resources.

In urban and semi-urban systems, legalization has an acceptable and ordinary effect in organizing the production sector, specially in

poultry production and horse management. Those are implemented to an average level in cattle, sheep and goat production specially on industrial scale. The policies and legalization have very little positive effect on use and improvement of animal resources in rural production specially on small holders scale.

The emphasis of the current policies and activities related to the use of animal resources is shown in table (6-4).

Use of imported breeds was of noticeable effect in dairy cattle, specially Friesians; their number is approaching 30-35 thousands distributed on about 16 working large scale dairy farms.

Importation, and acclimatization of some highly producing breeds of poultry such as Leghorn and Newhampshire was practiced long ago and now these breeds are considered as local breeds that contribute to different crosses for broiler production.

Local breeds of sheep, cattle and goats are extensively used in current improvement programs both in the state and private sectors of production.

Training and extension is very weak and needs intensification. Breeder's and farmer's organization are not existing or active.

**- Identification of priority needs for putting policies related to animal resources:**

Table (6-5) shows priorities categorized as an emergency, needed on intermediate and on long scale. Finance and technology are under the emergency category, management and planning under the intermediate scale and legalization is needed on the long time scale; specially implementation of such is the problem.

Priority of need to be met in the future in putting special policies for genetic resources conservation, and for use and development, were presented in tables (6-6) and (6-7).

Both needs: technology, infra structure, development of human resources, finance and organization structures, in all producing species, specially farm animals of major contribution such as cattle, sheep, goats and poultry.

Such measures needs a thorough planning and strict follow-up and evaluation.

**Table (6-3): The effect of the policies and legalization that is based on use of animal resources (usage and development)**

Species	Urban and semi-urban		Rural Production	
	Industrial	Small holders	Industrial	Small holders
Cattle	3	3	2	1
Buffalo	-	2	2	1
Sheep	3	2	2	1
Goat	3	2	2	1
Camel	-	-	-	-
Lama	-	-	-	-
Horses	4	3	2	1
Donkeys	-	-	-	-
Pigs	-	-	-	-
Poultry	5	4	3	3
Turkey	-	-	-	-
Gooses	-	-	-	-
Ducks	-	-	-	-
Rabbit	-	-	-	-

**Table (6-4): The emphasis of the current policies on activities related to use of animal resources**

Species	Activity			
	Use of Imported breeds	Use of local breeds	Training and extension	Breeder's / farmer's organization
Cattle	4	3	3	2
Buffalo	1	3	2	1
Sheep	2	4	3	2
Goat	2	3	2	1
Camel	1	1	1	1
Lama	1	1	1	1
Horses	1	2	2	2
Donkeys	1	1	1	1
Pigs				
Poultry	3	3	2	2
Turkey	1	1	1	1
Gooses	1	1	1	1
Ducks	1	1	1	1
Rabbit	1	1	1	1

**Table (6-5): Identification of need priorities for putting policies related to animal resources**

Needed as:	Needs		
	Emergency	Intermediate scale	Long scale
	Finance	Management	Legalization
	Technology	Planning	

**Table (6-6): Priority of need to be met in the future in putting special policies for genetic resources conservation**

Species	Developing policies related to				
	Technology	Infra structure	Human resources	finance	Organization structure
Cattle	4	3	3	3	5
Buffalo	2	3	3	3	4
Sheep	4	4	3	3	3
Goat	3	3	3	3	3
Camel	3	3	2	3	3
Lama	3	3	2	2	2
Horses	3	3	3	3	3
Donkeys	1	1	1	1	1
Pigs	1	1	1	1	1
Poultry	4	4	4	4	4
Turkey	2	2	2	2	2
Gooses	2	2	2	2	2
Ducks	2	2	2	2	2
Rabbit	1	1	1	1	1

**Table (6-7): Priority of needs to be met in the future in putting policies for use of genetic resources (use and development)**

Species	Developing policies related to.				
	Techorlogy	Infra structure	Human resources	Finance	Organization structure
Cattle	4	4	4	4	4
Buffalo	3	3	3	3	4
Sheep	4	4	3	3	4
Goat	3	4	3	3	3
Camel	3	3	3	2	2
Lama	3	3	2	2	2
Horses	3	3	4	3	2
Donkeys	2	2	1	2	1
Pigs	1	1	1	1	1
Poultry	5	4	5	4	4
Turkey	3	3	2	2	2
Gooses	3	3	2	2	2
Ducks	3	3	2	2	2
Rubbit	3	2	2	2	2