Camels and dromedaries: General perspectives

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Summary

Camels continue to be the preferred livestock species for utilizing extreme dry land areas. They are part of the culture of pastoralists and make up over 30% of the livestock biomass in such areas.
Pastoralists are seeking new systems of using their animals and increasing sales of surplus rather the keeping them to accumulate wealth.
The Camel Applied Research and Development Network succeeded in highlighting the case of the marginalized camel production sector, encouraged the establishment of the camel producers association, supported 17 national research systems and developed may technical packages for improving camel productivity.
Further activities would be focused on strategies and policies, technology transfer, marketing of camels and camel products and capacity building.

Key words: importance of camels, CARDN, Camelus dromedarius, Camelus bactrianus.

Background

The family camelidae is divided into two genera. The genus *Camelus* includes two species: *Camelus dromedarius*, the dromedary, the one humped or the Arabian camel; and the *Camelus bactrianus*, the bactrian or the two humped camel. The second genus is the *Lama* comprising four species: *Lama glama*, the *Llama* and *Lama pacos*, the *Alpaca* which are domesticated; and *Lama guanacoe*, the *guanaco* and *Lama vicugna*, the *vicuna* which are wild.
The habitat of the dromedary is the dry hot zones of Asia and Africa. The Bactrian camel lives in the cold deserts of southern areas of the former Soviet Union, Mongolia, East Central Asia and China. The lamoids are found in the cold heights of Latin America.
Scientists believe that the dromedary was first domesticated in Southern Arabia (Zeuner, 1963) or in Northern steppes of Arabia (Bulliet, 1977; Mikesell, 1955). However, Khanna (1990) reported that the dromedary might have been separately domesticated in India.

The camel plays vital socio economic roles and supports the survival of millions of people in the semi-dry and arid zones of Asia and Africa. Camel milk is the sole nourishment for the pastoralists for prolonged periods each year. The camel proved it is the most fit domestic animal during severe drought periods. The camel not only survived such droughts, but continued producing and reproducing while other animals ceased production or died out.

The camel possesses unique qualities which make it superior to other domesticated animals in the hot and arid desert ecosystems. These attributes of the camel are reinforced by its ability to traverse considerable distances with much less effort than other species, moving from one patch of short lived vegetation to another.

The role of camel as a domestic animal is undergoing fundamental changes as subsistence nomadism shifts towards semi-sedentary cash demanding systems. Problems associated with the lack of knowledge, due to insufficient research in the past, are further compounded to day by the challenge of change. The camels of poor families in arid and semi arid areas should become more productive and competitive if the communities concerned are to survive.

The relative importance of camels

Camel numbers increased from 17.671 to 18.783 million in the world during the period 1993-2002 (FAO, 2003). The African cotenant possesses about 13 million, while Asia and Australia have about 4.5 and 0.3 million, respectively. South America possesses about 6.2 million lamoids. There are 12.4 million camels in the Arab countries and 12.5 million in CARDN countries (Figure 1).

In spite of the fact that camel numbers have increased during the last decade, the relative importance as biomass has slightly decreased due increased numbers (and biomass) of cattle in general during the same period. Camels comprised about 6.5, 0.84, 19.2 and 14.8% of the total animal biomass in Africa, Asia, the Arab countries and CARDN countries in 1993, respectively. These ratios decreased to 6.2, 0.7, (Figure 2) 15.1 and 10.1% (Figure 3) in the related areas in 2002, respectively.

The decline of the role of the camel as a mean for transport and agricultural work due to the rapid socio economics changes during the last few decades, and the exclusion of camels from support (crediting and research) have led to the increase in cattle (dairy and beef) projects and numbers, and hence, the slight decrease in the relative importance of the camel.

Total world milk production from camels increased from 4.8 to 5.1 million tons during the period 1993-2002. Meat, hide and fiber production also increased from 353, 28 and 21 thousand tons, respectively in 1993 to 376, 30, and 23 thousand tons, respectively in 2002 (FAO, 2003).

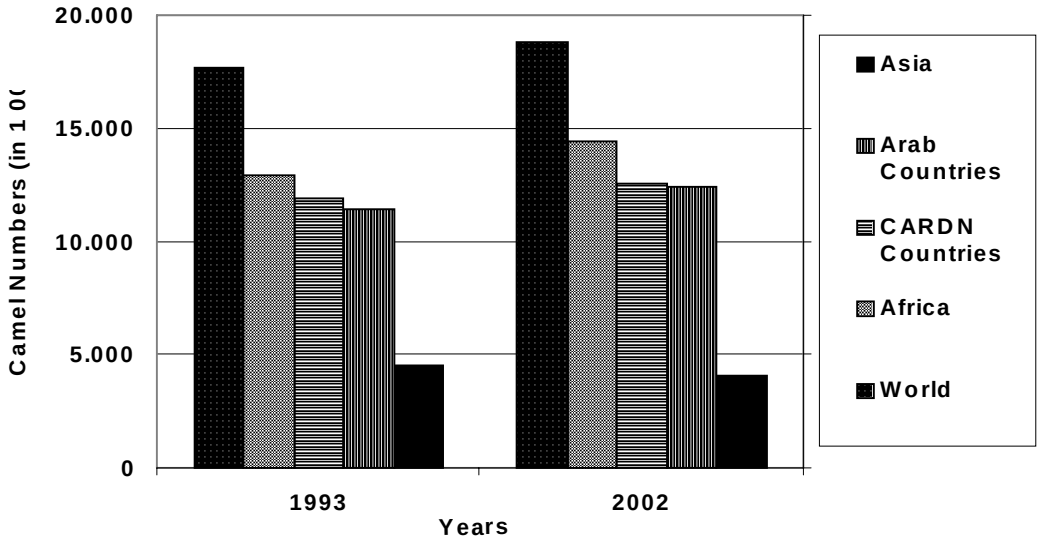

Figure 1. Development of camel heads, in the years 1993 and 2002 in some African and Asian countries.

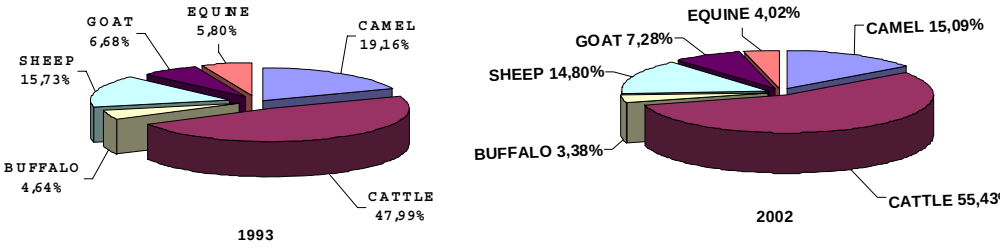

Figure 2. Relative Importance of camels (TLU) in the Arab Countries, in the years 1993 and 2002.

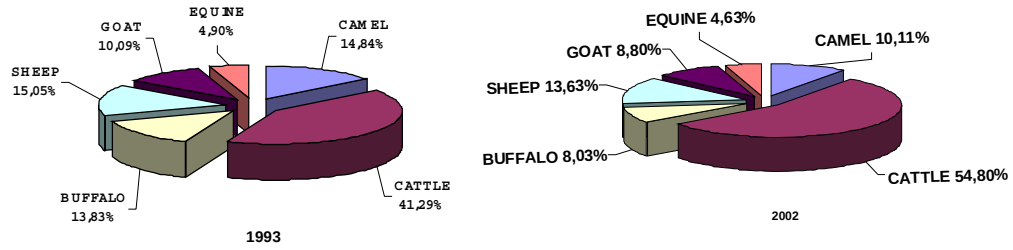

Figure 3. Relative Importance of Camels (TLU) in CARDN Countries, in the years 1993 and 2002.

The Camel Applied Research and Development Network (CARDN)

The virtues of camel include their ability to tolerate several days without access to drinking water without decreasing feed intake and milk yield, which makes it possible to use pasture in areas and at times where there is no water available; and selection of feed which is unpalatable, indigestible or out of reach for other livestock. As there is little overlap with feed selected by other species, increasing the proportion of camels under mixed species stocking allows for higher stocking rate without the risk of long-term damage to the vegetation. Camels have the capacity to travel and to carry loads under these conditions over long distance. Relatively, camels have low susceptibility to certain contagious diseases; and they ensure a decent life of pastoralists on extreme dry lands under non-sedentary livestock systems.

Keeping camels enables people to live in areas which otherwise would not be usable by man. They benefit in particular important pastoral groups, the poor pastoralists in that they:

- provide through their milk daily subsistence needs of food;
- generate income through sales of excess animals;
- ensure security through capital accumulation;
- ensure social links; and
- provide transport, which is a necessary element of the mobility in pastoralist systems as water and feed are not available at one site during all periods of the year.

The unique qualities which make the camel superior to other domestic animals in hot and arid desert ecosystem have attracted the attention of many regional and international organizations. The Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD) and the International Fund for Agricultural Development (IFAD) with the support of the Islamic Development Bank and the French Government have established the Camel Applied Research and Development Network (CARDN) in 1991.

The scope of CARDN includes countries in Asia and Africa where the camel is of economical or of special importance. The main objectives of CARDN are to:

- assist national research systems to improve and generate (and assist in the adoption of) appropriate technologies in order to ensure sustainable resource use and enable long-term of camel-based production systems;
- assist with the identification of problem areas;
- promote networking where appropriate and seek financial support for its successful operations;
- ensure that results from research are applied where applicable; and
- document and disseminate research results.

The programme is co-ordinated by ACSAD.

Each member country assigned a national Technical/Planning Committee, which is headed by the National Co-ordinator, who oversees the network activities in the country.

A Steering Committee (SC) is the set up for overall governance of the network. The SC is composed of:

- a Senior ACSAD staff (chair);
- one IFAD representative;
- one or two representatives from each of the country groups;
- representatives from donors and potential donors of the network; and
- the network co-ordinator.

The distribution of research work among member countries took into consideration:

1. research priorities for each country;
2. the advancement of research in certain topics;
3. the availability of scientists and facilities; and
4. the tight budget. In certain cases, the same research work was repeated in two countries which have different ecosystems.

CARDN and the case of camel production

CARDN has succeeded in highlighting the case of camel production and the long ignored camel pastoralists. Such a case was brought to the attention of the highest authorities in member countries and elsewhere. Presidents; Prime Ministers; Ministers of Agriculture, Economics, Environments, foreign affairs, and finance; and organizations and NGOS in member countries and elsewhere have considered the camel as one of the key factors for food security in the arid and semi arid zones.

As a result of such activities of CARDN, the concerned parties in member countries have included the camel and camel producers in their plans and started initiating and establishing development projects in the camel producing areas.

Moreover, CARDN has been able to play a very important role in strengthening and help establishing research centers, units and courses in many countries. The intervention of CARDN with authorities has lead to the increase of Camel Research Centers and Units from 5 in the early 1990s to over 35 in member countries, and 10 elsewhere by 2004.

The National Committees for Camel Research and Development

A National Committee for Camel Research and Development was established in each member country of CARDN. The main objectives of the committee are to:

1. coordinate among national research centers;
2. outline the priorities of camel research;
3. form a team of work for each research topic, and
4. conduct the research work within the framework of the programme of CARDN.

The national committee for camel research consistes of well-known scientists in the field and is headed by national coordinator and was officially announced by an order from the Minister of Agriculture in each member country of CARDN.

The initial socio-economic studies of the camel production sector have releavled very important results. Traditional management systems and practices have been studied and experts are exploring means to help improving such systems and practices.

CARDN played an important role in the establishment of the International Camel Pastoral Association in 2001. The main objective of this association is to follow up the development of the camel production in member countries. The Sudan offered to host the association.

CARDN supported NARS in conducting 42 research activities, supported 17 laboratories and established four laboratories for artificial insemination and embryo transfer (a grant for the Islamic Development Bank). Four mobile veterinary units are being purchased to be used in four member countries.

Basic and applied biological research focused on performance, reproduction, nutrition, health, and pre and postnatal mortalities are mainly carried out.

Applied research led to development the following technical packages:

- Colostrom feeding to camel calves to reduce calf mortality.
- Feeding local agricultural by products to reduce grazing pressures and improve reproductive efficiency in camels.
- Utilization of traditional veterinary practices to treat camel diseases.
- Early weaning as a tool for increased herd productivity.
- Camel fattening.
- Camel milk processing.

Studies on marketing of camels and camel products were conducted in 5 member countries were camel production is important (Sudan, Pakistan and Tunisia) and where camel products are highly appreciated (Egypt, Mauritania and Tunisia).

Studies on standardizing camel products are being finalized.

Scientific meetings

CARDN held 38 symposia and workshops, and 13 training course. Experts from CARDN countries participated in 41 conferences, symposia, workshops and training course which were organized by other organizations.

Prizes

A number of collaborating scientists received high national prizes and decoration for their contribution in camel research.

- Mr. Mostapha Gellouze, the national Coordinator of CARDN-Tunisia.
- Mr. Afaf Saad Eddin Fahmy, National Research Center, Molecular Biology Department, Egypt.
- Mr. Saleh Ahmed Mohamad, National Research Center, Molecular Biology Department, Egypt.

The Camel Documentation Unit

The Camel Applied Research and Development Network has established a Camel Documentation Unit (CDU) in order to furnish available research results on camels to scientists, researchers, extension services workers and interested parties. Camel research centers and camel scientists and experts are also surveyed throughout the world in order to coordinate research programmes, and exchange information and experiences.

Over 50 graduate students have been helped and hundreds of scientists have benefited from CDU. Moreover, CDU is publishing the following two important periodicals. The Camel Newsletter (CNL) and the Journal of Camel Science (JCS).

Future themes and activities

This matrix would fit a programme for a third phase of the Camel Applied Research and Development Network (CARDN). However, part of it was included in the programme of CARDN-II during the period July 2003-December 2004 within budget permission. A list of the future themes and activities is summarised in table 1.

Table 1. Future themes and activities.

Themes	Activities
Strategy and policy	1. Development of Camel production (All countries). 2. Integrated systems for development (Tunisia). 3. Encourage establishment of herders organizations / cooperatives (Most countries). 4. Genetic improvement (Iran and Sudan). 5. NGO's participation (Pakistan). 6. Use of AI (Iran).
Technology Transfer	1. Provide (Developed technologies): 2. AI techniques (Algeria, Iran). 3. Feeding regimes (Egypt, Morocco, Pakistan and Tunisia). 4. Milk processing (Mauritania, Pakistan and Tunisia). 5. Early weaning (Tunisia). 6. Disease control (Egypt, Mauritania, Sudan and Tunisia). 7. Herd book keeping (Tunisia). 8. Camel drawn implements (Pakistan).
	Need: 1. AI techniques (Syria, Tunisia and Yemen). 2. Feeding regimes (Iran, Jordan, Sudan, Syria and Yemen). 3. Milk processing (Jordan, Sudan, Syria and Yemen). 4. Meat processing (Iran, Pakistan, Syria and Yemen). 5. Early weaning (Pakistan, Syria and Yemen). 6. Disease control (Syria, Tunisia and Yemen). 7. Herd Book keeping (Iran and Sudan).

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Themes	Activities
Quality Control of products: Standards	Need: 1. Products (milk, meat, hiders, and fiber) All countrie 2. Value addition (All countries). 3. Grading as per ISO / WTO requirements procedure and implementing tools (Tunisia).
Marketing	1. Marketing live animals (Egypt, Mauritania, Pakistan, Sudan and Yemen). 2. Marketing of camel meat (Algeria, Egypt, Iran, Morocco, Mauritania, Pakistan, Syria, Tunisia and Yemen). 3. Marketing of camel milk (Iran, Jordan, Morocco, Mauritania, Pakistan, Tunisia and Yemen). 4. Marketing of camel hides and fiber (Egypt, Mauritania, Pakistan, Tunisia and Yemen). 5. Legislation (Egypt and Tunisia). 6. Integrated production system (Tunisia). 7. Marketing intelligence (Pakistan, Sudan and Tunisia).
Capacity building	A. for Producers: 1. Organization (Morocco). 2. Range management (Egypt, Iran and Tunisia). 3. Feeding regimes (Egypt, Iran, Jordan, Mauritania and Sudan). 4. Disease control (Iran and Mauritania). 5. Milk processing (Jordan, Pakistan and Sudan). 6. Marketing aspects (Pakistan, Sudan and Tunisia). 7. Decision Making (Tunisia). B. Researchers: 1. Disease control (Algeria, Pakistan, Sudan and Syria). 2. ET and AI Reproduction (Egypt, Iran, Pakistan, Sudan, Syria and Tunisia). 3. 3. Marketing (Egypt). 4. 4. Feeding and Nutrition : Master trainers (Pakistan). C. Extension Officers: 1. Reproduction: (Algeria, Egypt, Tunisia and Yemen). 2. Feeding and Nutrition : (Algeria, Egypt, Jordan, Mauritania, Syria, Tunisia and Yemen). 3. Market skills: (Morocco , Sudan and Yemen). 4. Disease control: (Jordan, Sudan, Syria, Tunisia). 5. Milk processing: (Iran, Jordan, Mauritania, Sudan, Syria and Yemen). 6. Meat processing: (Morocco, Mauritania, Sudan, Syria and Yemen). 7. Camel use for poverty alleviation: (Pakistan).

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