

**First Draft Country Report on the Status and
Perspectives of the Animal Genetic Resources
Development and Conservation in Islamic
Republic of Afghanistan**

Dr. Mustafa Zafar

National Livestock Production Field Officer (FAOAFG)

National Coordinator of AnGR in Afghanistan

General structure of the Country Report:

Part 1: Description of Animal Genetic Resources Status in Farm Animal Sector of Afghanistan

- 1.0 - Introduction/Background
- 1.1. - Review of the main Farming Systems in Afghanistan
- 1.1.1 - Sedentary Farming system
 - A- Village cattle production
 - B- Small ruminant production by villagers
- 1.1.2 – Nomadic farming system- the kuchi
- 1.1.3 - Karakul sheep production
- 1.2 - Husbandry and management practices and existing infrastructures
- 1.3 - Animal production systems and breeds involved
- 1.4 - Animal products
- 1.4.1 - Level of animal production
- 1.5 - Conservation and utilization/improvement activities of AnGR in Afghanistan
- 1.6 - Assessment of animal numbers, Animal Genetic Resources, their uses and technology employed
 - 1.6.1 - Animal numbers
 - 1.6.2 - Animal Genetic Resources, their uses and technology employed
 - 1.6.2.1 - Cattle
 - A- The Kandahari cattle breed
 - B- The Kunari cattle breed
 - C- The Sistani cattle breed
 - D- The Watani cattle breed
 - 1.6.2.2 - Buffaloes
 - 1.6.2.3 - Sheep
 - A- The Karakul sheep breed
 - B- The Ghaljhai sheep breed
 - C- The Arabi sheep breed
 - D- The Turki sheep breed
 - E- The Baluchi sheep breed
 - F- The Hazaragi sheep breed
 - 1.6.2.4 - Goats
 - 1.6.2.5 - Horses, Donkeys/mules and camels
 - A- Horses
 - B- Donkeys/Mules
 - C- Camels
 - 1.6.2.6 - Poultry
 - 1.6.2.7 - Opportunity in use and development of AnGR in Afghanistan
 - 1.8 - The main problems in the use, conservation and utilization of AnGR in Afghanistan

Part 2. Livestock sector analyzing leading to the policy/strategy for livestock development

- 2.1 Past policies for AnGR in Afghanistan.
- 2.2 Situation analyzing
- 2.3 Future demands and trends (animal Products).
- 2.4 Outlining Future National policy for conservation and utilization of AnGR in Afghanistan

Draft Policy Framework for the livestock sub-sector

- 2.4.1 - Issues to be addressed and priorities
 - 1- General issues of the livestock sub-sector
 - 2- Issues particularly related to animal health
 - 3- Specific problems related to animal husbandry
- 2.4.2 - Overall objectives
- 2.4.3 - Policy issues
- 2.4.4 - Role of the private sector
- 2.4.5 - Sectoral policy and strategy
 - 2.4.5.1 - Institutional reform
 - 2.4.5.1.1 - Coordination mechanism
 - 2.4.5.1.2 - Restructuring and reform of animal health and husbandry public services
 - 2.4.5.1.3 - Public services management systems and privatization
 - 2.4.5.1.4 - Rehabilitation of public services infrastructures and equipments
- 2.4.5.2 - Specific strategy approaches
 - 2.4.5.2.1 - Specific veterinary policies and strategies
 - 2.4.5.2.1.1 - Prevention and control of contagious diseases
 - 2.4.5.2.1.2 - Veterinary services and drug delivery
 - 2.4.5.2.1.3 - Control of zoonotic diseases
 - 2.4.5.2.1.4 - Organization of veterinary public hygiene
- 2.4.5.2.2 - Specific animal husbandry policies and strategies
 - 2.4.5.2.2.1 - Genetic improvement and management
 - A- Cattle and buffaloes
 - B- Sheep and goats
 - C- Horses, Donkeys and Camels
 - D- Poultry and fowls
 - E- Bee keeping
 - F- Silk worms
 - G- Fish farming
- 2.4.5.3 - Feed and Feeding
 - 1 - Natural pasture
 - 2 - Fodder production
- 2.4.5.4 - Animal husbandry techniques
 - 2.4.5.4.1 - Traditional livestock practices
 - 2.4.5.4.2 - Modern intensive production

2.4.6 -

Human development

2.4.7 -

Legislation and requirements

Part 3:

State of national capacity and assessing Future capacity building requirements

Part 4:

National priorities for the conservation and utilization of AnGR

Part 5:

Recommendations for international co-operation in the field of farm animal biodiversity

6 -

Conclusion

7 -

References

Animal Genetic Resources of Afghanistan



Afghanistan



General structure of the Country Report on Animal Genetic Resources in Afghanistan

Part 1 - Description of animal Genetic Resources statues in Farm Animal Sector of Afghanistan

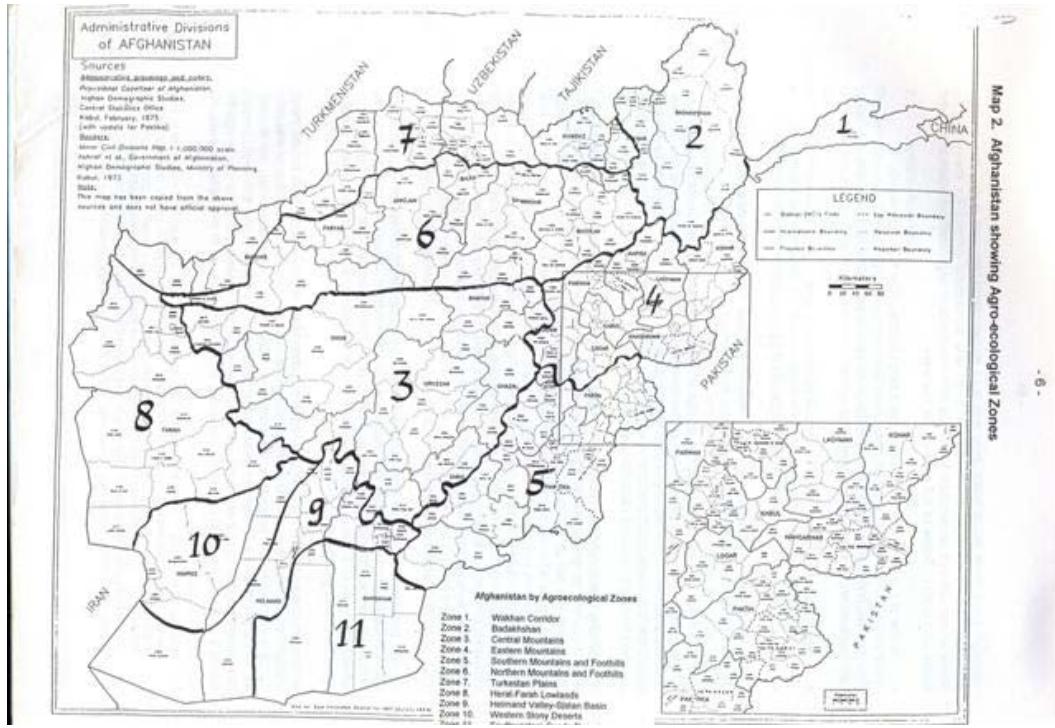
1.0: Background/ Description

Afghanistan is a mountainous and landlocked country and about ¾ part of this country is mountain situated 29-38 grads latitude North and 61-79 grads longitude east. It consists of vast mountain ranges and desolate barren land with few dotted areas in plains and valleys where small communities linked together by crisscrossing trails subsist on agriculture.

The Islamic Republic of Afghanistan situated in Central Asia, which shares borders with Iran to the West, the Tajikistan, Uzbekistan and Turkmenistan to the North, China to the extreme Northeast and Pakistan to the South and West. Its rugged topography and extreme temperatures provide a harsh environment for economic development. Most of the area is above 1200 meters mean Sea level with mountains extending even beyond 6000 meters mean Sea level. A dominant physical feature is the central Hindu-kush mountain range, which divides the country into five major regions (Eastern, Northern, Central, Southwest and Western) on the five principal river systems that provide the water for irrigation which is the prime source of agricultural production in what is otherwise a harsh arid climate. These are the Amu River in the North, the Hari-Rod River in the West, the Helmand and Arghandab Rivers in the Southwest and the Kabul and Kunar Rivers in the East.

The land resources of Afghanistan are briefly described on the basis of Dupree's (1973/1980) eleven geographic zones, with additional information from other references and from field observations, which are described follow:

- 1- Wakhan
- 2- Badakhshan
- 3- Central mountains
- 4- Eastern mountains
- 5- Southern mountains and Foothills
- 6- Northern Mountains and Floothills
- 7- Turkistan Plains
- 8- Herat-Farah Lowlands
- 9- Helmand Valley-Sistan Basin
- 10- Western Stony Deserts
- 11- Southwestern Sandy Deserts



The first six zones relate to the Hindu Kush mountain system, young rugged ranges with sharp peaks, deep valleys, and many almost impenetrable barriers. The remaining five zones embrace the deserts and plains which surround the mountains to the north, west, south and southeast see Map 2).

The total land area of Afghanistan measures about 65.3 million hectares out of which 27.4 million hectares is mountainous and deserts area, 30.0 million hectares is lawns ranges and 7.9 millions hectares is agricultural area. From 27.4 million hectares of the mountainous area only 1.97 million hectare is forests reported in 1979 and about 95 % of the area is natural forests and 5 % is artificial forest. Lawns and ranges are including 30 million hectares of land mostly located in the south west part of the country with very low quality of forages. Because the altitude of the area is from 500 to 1000 meters from the sea level includes sandy desert area of Regustan district and desert area of Margo which are the largest desert in the country, the lowest annual rainfall is 34 mm but in general the annual rainfall is less than 100 mm. Therefore, the growth of ranges is not good and not enough to raise animals. Ranges and pastures are located in the north part of the country is extended toward the north with a slight slope reaches to the Quraqrum boarder and has a good ranges to raise animals. The lowest altitude in the country which is 295 meter from the sea level located in Khume-I-Ab area. In the west part of the country there are flat area surrounding by high mountains. In the mentioned area there are sandy area called (Moving sand) which is not good for raising animals. The above areas of Afghanistan is mostly has a dry and semi desert climate. There is a big difference between day and night temperature in Afghanistan generally the highest temperature is 51°C in Zarange City of Nemroze province, and the lowest temperature is -52.2°C in Ghore province, which is not suitable for raising animas.

The maximum annual rainfall is in Zarange reaches to 34 mm. in area where annual rainfall is less than 100 mm suitable pasture to raise animals can obtain. Suitable

pasture can not be obtained from the central part of the country which has high annual rainfall to raise animals.

From 7.9 million hectares of agricultural land is about half of that is under water shortage. As per reported in 1998 the agricultural production decreased 53 % compare to years before the war (About 40 % of irrigation system is destroyed unfortunately in the year of 2000 farmers of most of the provinces grown opium on their land which occupied 91000 hectares and reached to 70 % of total opium production of the world. Fortunately, by the help of international community peace will come to Afghanistan and the farmers should stop growing opium. Basic and important problem of the people of Afghanistan in relation to the desertification and destruction of forests is lack of fuel and cooking as well as for heating such as coal, gas and electricity. Sometimes people are using the plant residue from the agricultural land for fuel this will reduce the productivity of the soil for example the organic matter content of Afghan soil is less than 1 %.

As mentioned above the climate is arid continental with cold, wet winters and dry, hot summers and with very sharp differences between day and night temperatures and varying considerably across the months and provinces, the major factor determining the climate being the altitude. The precipitation is generally low being 15-25 cm at lower altitude, while it is about 40 cm at higher altitude, but mostly in the form of snow.

Rainfall, which is highly variable from year to year, ranges about 1000 mm annually in mountainous areas to 100 mm per year in desert regions. Temperatures fall below freezing for much of the winter and rise to over 30 C° in the summer. The hot dry summers in the west are further characterized by strong winds, which persist from June to September. Humidity is low and evaporation rates are high.

Total human population is estimated about 22,191 million of which about 20,691 million sedentary and about 1,500 million are classified as transhumant/nomadic. The rural population makes up 80-90 percent of the total. Population is thought to be growing at around 1.92% per annum, and while urban migration results in a higher growth rate for the urban and rural population, the latter is believed still to be growing in absolute term. The population of working age is estimated at about 7.8 million, 4.8 million of which are actively employed. An estimated 3.3 million persons, or about 85 % of the labor force, are employed in the agriculture sector and contributing nearly 80 % of the Gross National Production.

Dupree (1973) divides the rural population into the following four groups:

Sedentary farmers: agriculturists who live permanently in the same village.

Semi-sedentary: agriculturists who own enough livestock to be moved by herdsmen in the summer to highland pastures and to be returned towards

Semi-nomads: herdsmen who practice some agriculture; part of such a group moves with the livestock to summer pastures while the remainder tend crops in the winter headquarters.

Nomads: herdsmen who move as a group from summer to winter pastures and back again; nomads don't own grazing land but depend on traditional grazing rights, for which they sometimes pay. A wide variety of crops are grown, but due to limited irrigation facilities one year of good crops is usually followed by 2-4 years of drought.

A key feature of Afghan agriculture is the wide disparity in productive capacity between the various land types. Three quarters of the land supports only sparse extensive grazing in mountains or deserts, while the five percent of land area, which was the irrigated valleys, produced 85 percent of all agricultural output. In 1978, the last year of peace, Afghanistan was largely self-sufficient in food and was a significant export of high quality fruit, silk, pelt, cotton and other products.

About 80- 85 percent of the total population was engaged in agriculture, livestock, and livestock based handicrafts. Agriculture being a dominant sector of the economy of Afghanistan contributes about 60 percent to GDP (est. 1990). Before war (1979), agriculture accounted for about 60 percent of export earning and employed 53 percent of the total labor force. Within agriculture, livestock is the major sub-sector; however, there are no reliable data about the contributions that are made by different sub-sectors of the agricultural economy. It is estimated that livestock products contributed 16-18 percent in the Gross National Products and about 14 percent in the exports beside 9 percent for carpets and rugs (est. 1990).

Administratively, Afghanistan is divided into 34 provinces. Each of which is headed by a state governor who is supported by provincial departments from ministry of the central government.

1.1 - Review of the main Farming Systems in Afghanistan

The lack of current information on agricultural production, farming systems and demography is one of the key problems in elaborating a strategy for agriculture and livestock sub-sector rehabilitation and development in Afghanistan.

The agricultural production system is both simple and robust. The basic production pattern has changed little in over 2000 years, yet the farmers have shown remarkable ability to adapt to sophisticated technology, such as high yielding crop varieties, inorganic fertilizers, veterinary chemicals and improvement of farm animals especially cattle and sheep through artificial insemination methods. The very simplicity of the system has been a major strength in the rapid re-establishment of agricultural production where fighting has stopped.

The irrigated production system is highly diversified. Although wheat is the staple food crop, significant quantities of rice, maize/corn, barley, Sugar beet, grams and pulses are produced together with large volumes of fruit and vegetables for domestic consumption or sale. Livestock are fully integrated into the system. Meat and other animal products are a significant part of the output. Historically, agriculture sector output has included processed items such as dried fruit, cotton, silk, honey, carpet, astrakhan pelt and etc which have provided valuable local markets for farmers and contributed to foreign exchange earnings.

The small productive land base and the high dependence on irrigation mean that for long-term survival, it is necessary to maximize production per unit of land and water. This in turn, means that the technical emphasis must be on high productivity systems with high yielding varieties, use of inorganic fertilizer and a high degree of crop care. It also means that great care must be taken to protect the resource base by sustainable land use and water management practices. However, the economical situation of the farmers are very weak and the farmers own limited area of land which the production will not be enough for the family during the whole year, or the other hand scarcity of water for irrigation, lack of organic and chemical fertilizer and agriculture machinery also are other limiting factors for high agricultural productions.

According to the main livestock production , there are two main types of livestock production systems in Afghanistan, those of sedentary villagers and the transhumant (Kuchi) systems; karakul sheep production is a third, specialized, sub-system in the north of the country.

1.1.1 - Sedentary Farming System

A - Village Cattle Production

In all regions of Afghanistan cattle are very important to cultivate land and for milk production. In 1991 a national average of 82 percent of farmers (who had any cattle at all) owned an average of 2- 4 cattle. The production of farmers owning their own oxen in the same year was 70 percent, with 46 percent of the farmers owning two or more. Oxen are the

traditional source of farm power, but tractors are becoming more widely used and are replacing animal draught power. There is a clear difference in relative use of oxen and tractors for cultivation. Although few farmers own their own tractor and the use of tractor is more common on bigger farmers. As in other countries of the region with similar agriculture conditions, the intensification of crop production and the easier availability of tractors and fuel will further decrease the importance of cattle for farm power, while at the same time the already important function of cattle for milk and meat productions will further increase.

Even the smallest and poorest farmers keep at least one cow to provide their subsistence requirements for dairy products, but many farmers have more than one cow, and this is a common pattern all over the country. In all regions of Afghanistan the farmers have a strong interest to increase milk production from cattle. Compared to small ruminants cattle have important benefits for milk production, especially for small farmers. Because few numbers of cattle are easier to manage than sheep or goats, cattle have a longer lactation length and less seasonality of production and they remain in the villages during the whole year, thus allowing the supply of fresh milk and dairy products to the whole family. Because of the common system of management, many sheep and goats on the other hand move during the lactation period to summer pasture far from the villages, thus preventing the supply of fresh dairy products especially to women and children. There are interesting regional differences behind the intentions of the farmers to increase milk production. In the eastern and southern Afghans priority is for increasing self sufficiency because here is not the culture to sell the fresh dairy products like milk, yoghurt or buttermilk and hardly some bodies is doing this. Any surplus of these products is freely distributed to relatives or other needy people, but butter, cheese and qurut (dried whey) is being sold. The main reasons for this business are poor management, low productivity potential of local dairy cattle breeds; shortage and poor quality feed stuff, unavailability of the specific breeding programmes/activities for improvement of the genetic potential of the indigenous breeds and finally unavailability of the sufficient and continual market for live animals and animal products. But in the Northern provinces the farmers are selling dairy products there are a good demand for dairy products on the urban market is a strong incentive to increase commercial milk production.

B - Small Ruminant Production by Villagers

About two thirds of the small ruminants in Afghanistan are owned by villagers, but in general ownership of sheep and goats for this group of people is less common than for cattle. On a national average only 57 percent of the farmers kept small ruminants in 1991 and by far the largest majority between one and twenty-five animals. Bigger flocks are except in the north with the largest average flock size in the Faryab, Jowzjan, Heart, Ghazni, Kandahar and Badghis provinces.

The management of small ruminants owned by villagers varies with the region, but shows common characteristics as well. Sheep and goats are usually herded together and both depend on grazing for the largest part of the year. Large owners may employ their own shepherd, or family members of villagers are herded in joint flocks. The great majorities of flocks move out of the hotter lowland areas in the early summer to reach the better grazing areas and

cooler weather of the highlands; most flocks will not return to the lowlands before the beginning of autumn. In Badakhshan and Nuristan small ruminants are not allowed to remain in the villages or the lowlands until the time of harvest of the crops (Bouy & Dasniere, 1994). Data on body weight changes during the year from Herat show, that those flocks, which do not migrate, are in the poorest condition (McArthur, 1980). Important summer grazing areas are in the Ghor and Ghazni provinces and the Dasht-i-Ish and Dasht-i-Shewa pastures in Badakhshan province.

During spring and summer adult animals and young stock are kept in different flocks and the rams are separated from the ewes until the mating season, which starts between October and November. During winter most village small ruminants are housed during the night and during bad weather. Hay, straw, leaves, different local types of roughage and concentrates are given as supplementary feeding during this period. In Nuristan, Laghman, Kunar and Paktya, the most important roughage for goats and sheep is leaves from the evergreen oak trees. The actual amount of feed given and the length of the feeding period depend on the region and the weather conditions. A supplementation with concentrates, for example 200-450 grams of maize or barley, for two months is a common practice.

Milking of sheep and goats starts early about two days after birth and continues for about four months. Normally lambs are allowed to suck during the same period twice daily, and great care is taken to ensure that they receive sufficient amounts. The remaining milk is partly consumed fresh, but mainly converted into dairy products (butter, ghee, cheese and chaka/qurud). Estimates for daily milk production range from 250-500 grams for sheep from different areas.

Sheep are shorn both once or twice a year and goats only once. The annual greasy wool production of ewes is 0.5-2.0 Kg, which is partly traded and partly used for domestic purposes. Especially Turki breed of sheep in the northeast have a high growth rate, but good growth performance during summer grazing has also been found in lambs from Herat (AcArthur, 1980). Surplus males, which are not needed for mating, are usually castrated in the first year. Many owners of small flocks slaughter the lambs in the autumn for production of dried mutton of the meat; sheep are preferred to goats for slaughter. Bigger flock owners in the northern areas sell lambs after weaning, which are then further fattened in small units of 5-10 lambs until autumn, or for the religious/ Eid days.

Sheep are the main species of small ruminants, but in some areas goats make up the majority in the flocks- high mountains areas like Noristan. Goats utilize alternative feed sources and are used to lead the combined flocks. According to the information from farmers, goats have higher twinning rates but also higher abortion rates and losses after birth than sheep.

In addition to meat, goats produce milk, hair and wool. They are normally shorn once a year in late spring and the hair is used for making ropes or the black tents of the Kuchis. Some farmers never shear their goats. Many of the goats in Afghanistan produce down fibre that is separated by hand from the hair after shearing, either by the flock owners or by workers employed by the wool dealers. Brown seems to be the dominant colour of cashmere wool from Afghanistan; all the cashmere wool for sell is marketed through Herat by only a few

dealers. Payment is made according to the proportion of hair fibre in the wool and the price per kilogram is determined the world market for that fibre.

1.1.2 - Nomadic Farming System- the Kuchies

The Kuchies are nomads that depend heavily on the rangelands to provide their animals needs. They move to the lowlands for the winter and to the mountain pastures in summer. They are important small ruminant producers as they own about one third of the national flock. They keep about four sheep for every goat but they also have donkeys, horses and camels for transport. Some of the wealthier and more modern families own a pick-up vehicle as well.

Nomads are more numerous in the south, the southwest and the west. Migration routes still remain much the same for the Kuchies that still have livestock, whilst in recent years others were prohibited from using some of the summer pastures because of the continuum conflict. Kuchies are largely ethnic Pushtoons and some of their traditional grazing grounds in Hazarajat were closed to them. In the north persecution of some Kuchies continues. A number of them have settled and become farmers. Among this group there is little long-distance migration as their animals graze the neighbouring mountain pastures with those belonging to sedentary farmers. In the west such groups remain semi-nomadic. The average number of animals owned by Kuchies families before the drought started was over 300 head, of which 83 percent were sheep and 13 percent were goats. Flocks remain outside throughout the year, mating is in October, lambing in February/March, and shearing in May. Owners feed some maize and barley grain, especially in winter. Diseases are often treated by the Kuchies but they acknowledge that they need help with animal health matters.

The Kuchies have apparently suffered the worst losses during the current drought. Overall their livestock reductions have been estimated at 80 to 95 percent, with 70 to 80 percent of these reductions being distress sales to traders at vastly reduced price. Many Kuchies in the southwest have lost all their animals and some or many families are now in the refugee camps for internally displaced persons at southwest areas (at Punjwaai and Spinboldak). For the last three years some Kuchies emerged from the Reg with 80 to 95 percent reduction of sheep and goats, and 50 to 60 percent reduction of donkeys and camels. There are apparently water holes in the middle of the Reg which enables the animals to survive there in winter. They are accustomed to fluctuations in herd and flock numbers and such difficulties increase their dependence on other aspects of their livelihoods, trade, cottage industries, money lending to farmers, etc.

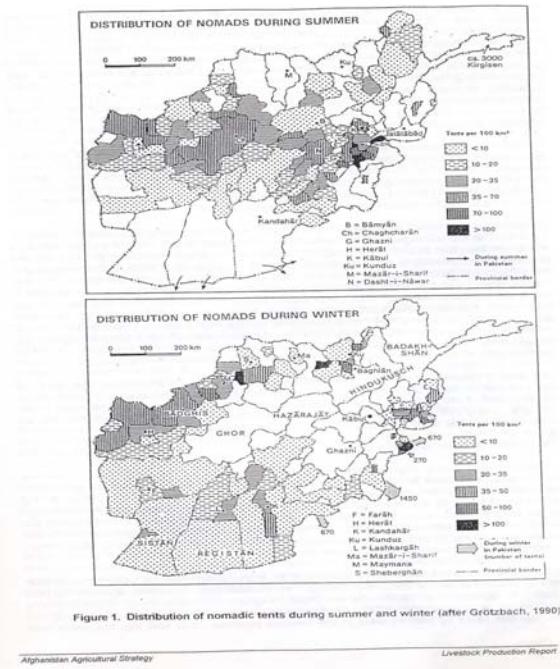


Figure 1. Distribution of nomadic tents during summer and winter (after Grötzbach, 1990)

1.1.3 - Karakul Sheep Production System

The Astrakhan pelt production from Karakul sheep is highly specialized form of sheep production mainly done by villagers and in northern Afghanistan. It started to become an important business after the 1920s when Turkmen and Uzbek refugees from the Central Asian republics of the former Soviet Union fled with their Karakul flocks to Afghanistan (Grotzbach, 1990). In the 1950s, Afghanistan controlled the major astrakhan markets, but later lost share due to lack of proper marketing and management and breeding of the Karakul flocks in the northern provinces, which would mean about one third of the sheep owned by villagers and thus the same proportion of this breed as before the war. The ability of the Karakul to produce meat and wool under very extreme climatic and ecological conditions has obviously helped it to survive those years when, due to war and lack of demand on the international markets, pelt production was of lesser importance. Problems with security and marketing of pelts may have reduced the number of Karakul sheep since then, but no exact information is available.

Karakul flocks are usually larger than other sheep flocks owned by villagers and many flocks consist of several hundred ewes. The main source of feed is natural pasture in one of the driest parts of the country, using different pastures in different seasons; however, supplementary feeding with hay and concentrates during winter or scarcity periods is practiced. For the production of astrakhan pelts Karakul lambs have to be slaughtered before the second day after birth, and owners therefore remain with their flocks during the lambing period to decide whether to rear or to pelt a lamb. The decision whether to slaughter or rear depends on the quality of the pelt and the pelt prices offered by dealers. Depending on these conditions, the

proportion of male and surplus female lambs pelted may range from 25 percent up to 95 percent. With an increasing demand for meat, Karakul farmers have started to recognize that rearing lambs for mutton can be more profitable than pelting the lambs, but the security situation and the need for cash in spring are still important reasons that favour pelting. It is possible that the available pastures are not sufficient to allow for the raising.

1.2 - Husbandry and Management Practices and existing Infrastructure

Animal husbandry is a normal adjunct to crop agriculture and cattle are kept for milk and meat production and for motile power for various operations, village transport, irrigation and production of manure. The animals are generally maintained on agricultural byproducts and crop residues.

Animal rearing is done mostly by small and marginal farmers and landless labors with a holding size of 2-4 animals per farm household. Average land holding with these owners is very meager, being 1.5 to 2 acres. This is the kind of input available in most of the areas.

Animal husbandry is a state subject, health and breeding aspects of cattle are looked after through a network of veterinary field units (VFUs) and artificial insemination breeding stations, which practically started their activities since 1995 as per need of farmers and kind attention by financial and technical support of the Food and Agriculture Organization of the United Nations. A veterinary surgeon is the focal point around which most animal improvement programmes are centered. In most of the planned improvement programmes, this focal point has been given the main responsibility of AI and field recording of data supplementary specialists, livestock assistants and field supervisor are provided to implement the development programmes. An AI network is used for dissemination of superior sires of temperate dairy cattle through crossbreeding to increase milk production. For this purpose some dairy farms were established by government for producing quality bulls and undertaking progeny testing programmes for some important indigenous breeds like Kandahary, Kunary, Sistani and Watani. Large government herds like Benehesar dairy farm and animal husbandry farms of Nangarhar and Helmand canals were also existed for commercial milk production. These herds were used for spreading superior germplasm to rural populations for improvement of their native cattle. This was the kind of structure that existed in the past on which any breeding plan had to become operation. At the time being the ministry of agriculture, livestock and food have the plan to rehabilitate these kinds of herds for improvement and development of the native breeds in around the country.

According to the management practice of cattle, there are also regional differences in the management of the cattle. In the eastern provinces, from Nangarhar in the east to Kandahar in the south, milking cows are usually kept within the compounds, where they are managed on a communal basis, but many of the cows may also never go out for grazing. The situation is different in the Northern provinces and the Herat area, where communal grazing of cattle, including cows, is the common practice. In some areas Nuristan and the Hazarajat in central Afghanistan cattle herds are moved to high pasture for the production of cheese and butter/ghee during summer.

During the summer and spring seasons, fresh Lucerne and /or clover (shaftal or berseem) and forage grasses is given to the stall-feed cows several times during the day and in those areas where cows go out for grazing in the evening at the homesteads. Important sources of winter-feeding for cattle all over Afghanistan are cereal straws, hay from grasses or legumes and maize stalks. Other sources of roughage, like leaves in Badakhshan and Nuristan provinces or camel thorn (Alhagi) in the northern Turkistan plains, have only regional importance. Great efforts are made to collect enough fodder, especially in those areas with a long winter period like Nuristan, Badakhshan or the Hazarajat, and large stacks of hay are stored on top of the cattle houses. Very often wheat straw is mixed with legume hay before feeding. Milking cows and working oxen usually also receive a supplementation with concentrates like cotton seed cake, maize or barley grain during winter.

In communal village herds, cows and bulls are herded together and natural mating from any available bull takes place on the pasture. This system provide the greatest chance for the cows to become pregnant but also means there is little selection for performance. The problem of finding breeding bulls for mating arises where farmers keep their cows at the homestead, and where the maintenance of a bull is too expensive for small farmers. Although some owners of bulls charge a fee for mating, this practice is not popular everywhere in Afghanistan.

During winter and in some areas during the hottest hours of the day during summer, cattle are housed inside. The types of byres in the different regions vary with respect to availability of space and quality of ventilation and lightning. Unhygienic condition seems to be more a problem of cattle houses in all regions of Afghanistan. Manure is carefully collected and used either as fertilizer or for burning.

Milking of the cows usually done by women and in some places like Nuristan by men twice a day, early in the morning and in the evening. Milking is commonly done inside of animal stables, outside, beside a restraining wooden post erected near the main kraal or under a tree. In most cases no attempt is made to wash the udder before milking. This may be due to the practice of allowing the calf to suckle before milking. This will result in same cleaning of the teats. A bad milking practice which is commonly observed is that of milkier dipping his finger into the milk as a means of lubricating the teats during milking. The calf is allowed to suckle to stimulate let down and the cow is then milked. The calf is allowed to suckle again before being tethered away from the cows for the night or taken to separate grazing grounds during the day.

Most of the milk in Afghanistan is produced in the villages by rural farmers with small land holdings and also by landless agricultural labors. Condition under which milk is produced in the villages is far from satisfactory, mainly because of the economic backwardness of the producers.

As mentioned above, the milk animals are housed in apart of the living space of the family or in small closed or open yards adjacent to the family house. Flooring is usually none plaster or mud. The cows are rarely washed before milking.

The predominates types of microflora in milk received in dairies are coli forms, micrococci, lactic streptococci, spore-forming aerobes and corynbacteria, the majority of these being contaminants fro milk utensils. There is also a high incidence of thermoduric bacteria.

At the time of milking, hands of the milkier as well as the udder of the animal or the milking utensils are seldom properly washed. Farmers lack practical knowledge of proper milk hygiene measures. The problems are more serious in the mountainous regions in the sheep and goats herds/flocks.

The fact that milk processing is confined to the household level, and the amount of milk processed is usually small, means that the equipment and vessels use as well as the techniques, have remained simple for a very long time. The main products made include fermented milk/yoghurt, butter, ghee, chaka/curud or concentrated fermented milk foods with enhanced keeping quality and few cases cheese.

Whatever milk is available for processing into traditional products is done by the housewife. So, the general standard of hygiene applied to milk production in Afghanistan is poor and as a result the quality of milk is poor.

Animal breeding and feeding pose major problems and difficulties to the small milk producers in Afghanistan. Because, traditional milk products are important and technical support services are commonly absent or insufficient.

1.3 - Animal production systems and breeds involved

Livestock production has always been an integrated part of smallholder farming systems in Afghanistan, providing farm power, income, supplementary food, wool and leather. Livestock have also provided a means of transforming crop residues and grazing into marketable commodities, and have also contributed to the maintenance of soil fertility.

There appears to be a positive correlation between the livestock component of small farm enterprise and food crop yields and net returns from farming (FAO-Afghanistan, 1995)

Table 1, pre-war national livestock herds estimates

Year	Sheep million heads	Goats million head	Cattle million head	Camels ,horses,donkey, mules million head
1967/68*: sedentary	17.8	3.1	3.4	1.81
nomads	3.6	0.07	0.2	0.26
total	21.4	3.2	3.6	2.07
Pre-war estimates**	26.8		4.85	2.04

Source*: Central statistic office, Ministry of planning, Kabul, 1978

Source*: UNDP Action plan for rehabilitation, 1993 (quoted by Cossins, 1994)

As these official figures have been based on ground estimates and district census returns and as no accurate remote-sensing methods have been applied, they may not be very accurate.

Before the war, livestock products were estimated to comprise 18 percent of the country's domestic product. While the majorities of small stock, and more or less all cattle, were owned by sedentary communities, some 27% of the national flock belonged to nomadic and semi-nomadic pastoralists who also owned camels.

Cattle are kept in smallholder mixed farming systems mainly as a means to cultivate land. Other reasons include milk, meat and manure, 84% of the nation's farmers own (or owned) cattle (SCA, 1990). Agro-climatic conditions however favour small ruminants, and large ruminants will continue to be important only so long as alternative means of farm power and fertilizer are not readily available. They are costly to feed and difficult to maintain on natural grazing resources. Large ruminants are rarely part of the transhumant system, and are also more dependent on fodder and crop by-products produced on farm than are small stock.

Sheep and goats are the key element in the livestock composite of Afghanistan, 77% of the nation's farmers own (or owned) sheep and goats (SCA, 1990). They are very important to poor upland farming families as butter; yoghurt, astrakhan pelts and wool and hair are important supplementary consumption and income earning products. Contrary to large ruminants, the productivity of small stock of smallholders can be improved by increasing their mobility (transhumant movement)

Horses, camels and donkeys/mules are particularly important for transport and traditional/popular sport- Buzkashi. In the north, horses are also a major status symbol.

1.4 - Animal products

As mentioned above, Animal husbandry is an integral part of agriculture in Afghanistan, providing livelihoods to 80% of the population. Prior to the war, the livestock sub sector accounted for 40% of the total export earnings, but over the years this share has shrunk so

much that in 2002 export earnings from karakul skins/ astrakhan pelt, skins and wool, excluding carpets, accounted no more than 2-5% (Guimbert, n.d.). Between 1978 and 1990, total output from livestock destined at an average rate of 5.5 percent per year (Ulfat and Iqbal, 2002). By late 1990s, the livestock population had almost reached the pre-war level and output was on the increases only to be decimated again from drought, diseases, crisis sales and production rates.

Before the war, per capita meat consumption was 11.5 Kg annually with an average of 4 Kg per capita for rural and urban poor. Milk consumption was 60 Kg per capita (Nyrop and Seekins, 1986). This ratio was reasonably high by most developing countries standard but has fallen since. Statistics are hard to come by, but an indication of the desline is that aggregate milk production from cows, sheep and goats in 2002 was about 964,270 metric ton giving a meager per capita of 36 Kg and aggregate meat production (including beef and small ruminant meat) was 322,000 metric ton, which on a per caput basis averaged 12 Kg per annum (Earth Trends, 2003), compared with about 19 Kg in Pakistan. The low level of milk and meat availability is primarily due to the low level of output which in turn is a consequence of the fall in livestock population, poor management and low productivity of animals.

Livestock offer opportunities to increases incomes and employment. Generally, the income elasticity's for livestock products are higher than for cereals. With rapid population growth of about 2, 0% per annum and increased urbanization and incomes, demand for livestock products in Afghanistan is likely to grow at a faster rate over the coming years. As domestic production cannot keep pace with demand, growth in consumption of livestock products occurs at the expense of increasing net imports. An indication of this is that between July and August 2002, Afghanistan imported animals worth Rs 30 million (about US\$ 5 million) from Pakistan to supplement a large yet unrecorded number of animals smuggled through the border. (www.pakistan.com/english/allabout/livestock/dairy). Mellor (2003) estimates that when incomes grow rapidly, at 5 percent per capita, the demand for livestock products grows at between 6 and 8 percent per year. And if the livestock sector meets this growth in demand it will double in size every 10 years and its share of agricultural GDP could also be 50 percent. In effect the agriculture sector will also grow at a much faster rate.

The case for promoting increased livestock production is pressing given the growing demand for animal products and a large proportion of the population living in extreme poverty, most of whom are dependent, at lest in part, on food and income derived from livestock.

GDP per capita in Afghanistan is growing at annual rate of 20 to 27 percent. Obviously this level of growth cannot be sustained for long, especially if poppy that powers the economy is eradicated. Nevertheless the underlying assumption would remain the same-that, demand for livestock products will continue to increase in the coming years, even if growth falls to a single digit number. Benefits from livestock development will in particular accrue to the poor and rural women, primarily because they tend to be more associated with livestock production than with crop production. Smallholder livestock production is also more labor intensive than crop production generating on- farm employment.

However, the livestock sub-sector faces immense problems such as loss of livestock and lack of restocking support, decreases productivity due to declining feed and overgrazing, and the spread of animal diseases. The drought that persisted for five years has decimated about 40 to 60 percent of the livestock population in the country (Ibid). Like the livestock sector, the poultry sector in Afghanistan has also been decimated. The endogenous breeds have very low production potential with annual mortality of chickens often reaching 80 to 85 percent of the population under the traditional system Antonio Rota, Senior Technical Advisor, FAO personal communication). Demand for poultry products exceeds domestic supply and large quantity of poultry meat is imported from as far as Brazil.

Based on mortality rates estimated by Schreuder et al, 1996 losses are estimated from a static herd structure. An attempt has made to estimate losses by classifying by age, sex and applying percentage mortality in each category. Mortality rate in poultry is high, but with vaccination against diseases and improved feed and management of birds, this is assumed to fall substantially. The head value of each type of animal is based on farm-gate price averaged for the country. Average prices reflect the price paid for animals intended for meat, transport and draught as well as the generally higher price paid for female animals for reproductive purposes in the post-drought period. Equines and camels are used as transport animals and farm power. Horses and donkeys are the commonest equines, but camels are also used in lowland areas to transport heavy goods. In some locations camels are also slaughtered for meat, but only after the animals have aged.

To estimated productivity, livestock products in Afghanistan are divided into seven broad categories: 1- milk, 2- Meat, 3- hides/ astrakhan pelts and skins, 4- Wool and hair, 6- Other livestock products, and 7- Work. Value of milk is further separated according to the species i.e. milk produced by cattle and sheep and goats. Similarly, meat is divided into mutton and beef. Other livestock by-products considered in the estimations are edibles, bones, blood, guts, horns, fat, dung, heads, trotters, etc. To estimate traction power it is assumed that the average time of oxen used as drought animals is 90 days in a year (Ulfat and Iqbal, 2000) and a pair of oxen could plough one Jerib (one- fifth of a hectare) in a day and the average rental rate would be US\$ 3-5 per day. The productivity gain from oxen saved through vaccination is thus derived by applying a daily rental rate of US\$ 4 to the total number of oxen saved. Equines (horses and donkeys/mules) are more commonly used as transport animals and the average time of their use as transport is assumed to be 60 days in a year, and the daily rental for a cart horse in Kunduz less feed cost is US\$ 4.5 and for donkeys US\$3. Camels are rarely used for transport, except when Kuchis move from one location to another. For poultry it is assumed that 50 percent of the chickens are laying eggs and each chick lays 150 eggs/year. But because the outlets are young thy will be productive for about 8 months only.

1.4.1 - Level of Animal Production

Milk is mostly produced in small quantities, of 2-4 litres, by small and marginal farmers in numerous and widely scattered villages. The farmers, whose principal occupation is agriculture, keep a few cows for milk production (2-4 animals on an average as a supplementary source of income).

The collection, transportation and distribution of fluid milk under the tropical and mountainous conditions prevailing in Afghanistan present many difficult problems. The production of milk in villages takes place on a very small scale in numerous scattered holdings, which makes the task of collection difficult. Many villages are not connected by good roads or without roads, and many more are inaccessible during the monsoon rains and snows.

There are no facilities for cooling or refrigeration of milk on receipt at village milk collection centers and rapid transport to city or a processing centers is hampered by lack of facilities, procurement of milk of suitable quality in condition fit for processing into marketable products is a formidable organizational task which has been performed well by many dairy cooperatives on a fairly large scale.

At the time being numerous agencies and persons are separately/individually involved in the collection, transportation, processing and distribution of milk and milk products; village producers who directly supply fluid milk to village milk collection centers, milk collectors who collect milk from milk producers and supply to the small scale collection centers of organized dairies or to urban areas, milk vendors, dairies who process market milk and milk products, wholesalers and retailers. Milk may be carried to urban areas or to the collection points as head loads, or in plastic containers suspended over shoulder slings, on bicycles, on a pack animals or donkeys and horses drawn carriages depending upon the quality of milk to be transported and distance involved. The demand for fluid milk and milk products of the urban areas is very high.

Generally speaking a large production of the milk production in Afghanistan is not dispatched to the industrial dairy industry but is used at the farm to make some dairy products which are very typical in this particular country of the world.

Traditional dairy products are made on a small scale, they are normally sold at town nearly and the end product is not standardized. However, their production remains related to some particular characteristics in the national dairy products systems and geographical characteristics of the region of the world. The main factors which are responsible for this sort of production in Afghanistan are:

- There are large distances from the dairy small scale farms to the nearest city where the products could be sold;
- In many regions of Afghanistan, roads are not good enough or without roads to make easy and fast transportation of raw milk to the commercial milk plants in order to provide a fresh and good quality raw material to use at the dairy industry. During winter season there are villages which become isolated due to the impossibility of transit by their poor roads;
- There are many small dairy farmers who produce a very small amount of milk each day, and being normally located far away from each other the collection costs are very expensive;
- The milk price, paid by buyers to the small farmers are punishing because:

- They are not individually relevant to the small amount of milk produced;
- The small farmers can not bulk their individual milks since it is economically impossible to cool the milk;
- Milk production has a very big seasonal relationship. Some small farmers don't milk cows during winter time;
- Normally they produce milk of poor quality mainly due to their lack of knowledge about management and feeding, breeding, and their small financial capacity.

Nevertheless, technical projects to improve milk quality have been developed in some regions of Afghanistan by the Food and Agriculture Organization of the United Stats under Integrated Dairy Development Programme since 1999 in Kabul, Kandahar, Mazar-i-Sharif and Kunduz provinces, since 2005 by Land O'Lakes and Agha Khoan in Parwan and Baghlan provinces. Most of the small farmers have not adapted new technology. They continue to work with the traditional methods and encounter the traditional troubles mentioned before.

Normally cheese of poor quality is obtained due to the poor quality raw milk used and the bad conditions which the product is made.

In these productions areas which are quit near to the schemes processing plants some producer's sell there milk to these schemes. The price of milk is determined according to a quality payment system in Kabul and fixed price according to the quantity in Mazar-I-Sharif and Kunduze.

1.5 - Conservation and utilization/improvement activities of AnGR in Afghanistan

Afghanistan never had a strong National Government. Given that there was no general agreement on what the structure and reach of any central government might be, it could be some time before such a government is formed and sufficiently well resourced to set and implement meaningful policies that represent the wishes of the people.

However, the production system at the farm and district level is sufficiently robust that an operation central government it is not essential for many of the activities in the agricultural including livestock sector to function. Accordingly, the emphasis in the strategy is, as far as possible, on relatively simple interventions at the local level. At this point they can be supported from the outside and contribute significantly to local output and capacity building. Over time, as national problems resolve themselves, the intervention can take on a more national character.

So, there were not the specific and clear programmes/activities for conservation and improvement of the farm animal genetic resources. The farmers continued their traditional animal husbandry practices. Only the breeding policy to begin with was to improve the defined indigenous breeds through selection and local cattle through grading up with superior indigenous breeds. In around 1955, the animal husbandry wing considered the need for an effective and rapid increase in milk production in cattle and set up a working group to review

the cattle breeding policy in the country. The working group examined the cattle breeding policy followed in each region (zone) and recommended broadly a revised policy for achieving increased milk production. However, no systematic analysis has been done on the performance of these breeds, though it is essential before implementing a large scale crossbreeding programme, for identifying suitable Bos Taurus breed and level of inheritance for different areas. The reports available (Masodi et al., 1965; Keshtiar et al., 1969), on the performance evaluation of native and crossbreed dairy cattle were less reliable as they were based on very few observations (less than 20 animals), and restricted to animals raised on only one farm. It was suggested that the bulk of exotic inheritance should come from Holstein, Jersey and Brown Swiss might be limited to a limited extent. Simultaneously, attempts were to be covered by such recognized dual purpose and dairy breeds as Kandahari, Kunari, Sistani and Watani. To achieve the ultimate objectives of raising the quality of cattle, both in regard to milk production and drought, it was thought necessary to undertake production of a large number of superior bulls, preferably progeny tested of pedigree, of these breeds of cattle for extensive use through natural and artificial breeding and for future replacement. Scientific programmes, to improve the productivity of the native breeds, were initiated and a number of dairy cattle farms of these breeds were established (Benehesar animal husbandry farm in Kabul, Animal husbandry and poultry farm of Helmand, Animal husbandry farm of Nangarhar Canal and etc) by public sector/Government for multiplication, extension and production of superior quality sires. The bulls produced were below the numbers required for the development programme. Bulls at these farms were selected on the basis of breed characteristics, body conformation and milk yield of their dams wherever available. Examination of records of these farms, in general, does not show any significant improvement in production over the years. It was therefore, decided that daughters' performance before they were used in development programmes for some of the improved indigenous breeds, like Kandahari, Kunary, Sistani and Watani under the region sponsored scheme were initiated. Results of these schemes were not encouraging mainly because of the small herd size used. Non-existence of deep freezing facilities at these farms also contributed to the failure of these schemes because by the time bulls became available after test, they were old to donate any semen. A fundamental change has taken place in the cattle development programmes since the formulation of breeding policy. Crossbreeding, which was to be taken up in a restricted manner, and in areas of low producing cattle, has now spread indiscriminately all over the country including the tracts of well established improved indigenous breeds? The country since then has advanced in the area of deep freezing semen and use of liquid semen is being replaced by frozen semen. The major strategy for development of indigenous cattle for milk has been to crossbreed with improved European dairy breeds. Initial crossbreeding attempts were not encouraging because of diseases. With the control of these diseases with prophylactic vaccines, planned crossbreeding experiments with various Euro-American breeds (Holstein, Jersey and Brown Swiss) were taken up in different parts of the country. Crossbreeding grades with different levels of exotic inheritance from one or two exotic breeds have been produced and their performance tested under different agro-climatic conditions. The following conclusion emerges from these experiments:

- Exotic inheritance of around 50 percent is the most ideal for growth, reproduction and milk production, and the yield in higher crosses fall short of theoretical expectation.
- Holstein crosses were superior to other temperate breeds crosses for growth and production while Jersey crosses have better reproductive efficiency.

These results indicate that in areas with good feed resources, specially irrigated cultivated fodder, crossbreeding of indigenous low producing cattle with Holstein and stabilization of exotic inheritance at 50 percent through inter-breeding and further improvement through selection may be adapted. Such crossbreed would produce around 3000 litres of milk per lactation and would have improved reproductive performance.

Without the above mentioned positive results, the following reasons for under-performance of crossbreds:

- Non-adaptability of crossbreds to poor and traditional animal husbandry management.
- Non-availability of enough and quality feed and fodder.
- Poor resistance to epidemic diseases.
- Genetic instability of crossbred animals.
- Poor draft capacity.
- Low price for milk because of low fat.
- Reproduction problems especially dystocia.
- Non-availability of superior crossbred males.

For conservation and utilization of AnGR in Afghanistan, the Government of Afghanistan designed some projects in governmental/public animal's farms by technical staff with different capacity in Kabul and other provinces by technical and financial support of international organizations for multiplication, extension and production purposes like: providing animal husbandry and animal health services for the public and private sector, improvement, development and utilization of different indigenousness animal's breeds, increasing of the quality and quantity of animals products, sieving of food security and development of the economic status in Afghanistan. These main projects were: Four dairy cattle farms, 13 to 14 of sheep production farms including karakul sheep production and 10 research farms of sheep, two poultry farms, 6-8 silkworm projects, 7-8 beekeeping projects, about 5 fishery projects and etc. had established by public sector around the country for the above mentioned purpose. But unfortunately all of the above mentioned animal's farms and projects looted and destroyed completely during the 2.5 decades of devastating war. During the last three years some of these farms and projects has been rehabilitated by the join efforts of Ministry of agriculture, livestock and food (MAAHF), National and international non governmental organizations (NGOs and UN agencies) like Benehesar dairy farm, Badambagh poultry farm, Darulaman silkworm project and some Beekeeping projects.

1.6 - Assessment of Animal numbers, Animal Genetic Resources, their uses and technology employed

1.6.1 - Animal Numbers

The latest agriculture census on livestock numbers was carried out in 1967 and later official pre-war data have been extrapolated from that information. Large numbers were lost during the 25 years conflict, socio-economic disruption, lack of stable government and about 7 years drought direct effects and because farmers were forced to sell their livestock for slaughter and most of their animals had died. Reports of the Agricultural Survey of Afghanistan (ASA) suggests that these losses amounted to at least 40-50 percent of all draft oxen, 67 percent of all small ruminants and 70 percent of the Karakul sheep. Own estimates based on the ASA survey from 1991 and on results from a headcount carried out by the project AFG/93/004-FAO in 1995 indicate that the livestock population has been built up and recovered substantially since the end of the war. The latest agricultural census on livestock numbers is carried out in 2003 by FAO and the estimated numbers for the different livestock categories and years are summarized in following table:

Table I. A comparison of Livestock numbers in Afghanistan 1967-2003 (, 000)

Species	1967	1981	1991	2003
Cattle	3633	2750	4049	3715
Sheep	21455	18900	18688	8772
Goats	3187	2900		7281
Horses	403	400	245	1421
Donkeys	1328	1300	1131	1587
Mule		32		
Camels	299	265	80	1752
Poultry				1216
Buffalo		35		

Source:

- 1- Central statistic Office; Afghan Agriculture in Figures (1978); Statistic Year Book 1360 (1983); (cited after Grotzbach, 1990)
- 2- Own estimated using data from: The Swedish Committee for Afghanistan, the Agricultural Survey of Afghanistan. 14th report, 1991 Survey
- 3- Estimates using data from the headcount 2003, organized by osro/AFG/212/ATI – November 2003

The figures from the headcount allow a rough estimate of the total population but they are the best information which is available at the moment. Including the animals owned by the Kuchis there appear to be a livestock population of 3.6 million cattle, 30.94 million small ruminants, 0.36 million horses, 1 million donkeys and 0.28 million camels in Afghanistan. The data from the headcount indicate, that the cattle numbers have reached almost pre-war level and one can assume that the improvement in the supply of oxen reported for the period until 1991 (ASA, 1992) has continued since then.

The estimates for the total number of small ruminants are higher than the official pre-war figures. This is in conflict with information from most interviewed livestock owners in all visited regions who claimed that they keep fewer animals than before the war. Also according to information from farmers the unsatisfactory security situation in some areas, especially in the Northern provinces still is an important reason which prevents them from building up their flock size.

Cattle numbers used to be comparatively even distributed over the country with some higher concentration in Ghor, Bamyan, Uruzgan in the center and Ghazni, Paktya, Nangarhar and Kunar provinces in east Afghanistan (Grotzbach, 1990). The ASA results from the 1991 Survey basically confirm this older information but also show a higher concentration of cattle in Jawzjan, Balkh, Kunduz, Takhar and Badakhshan provinces (ASA, 1992). The head count Survey from 1995 (Table 1) indicates, that nomadic livestock owners keep about 5 percent of all cattle, the majority in the eastern provinces of Kapisa, Logar, Parwan and Nangarhar. The highest concentration of small ruminants owned by resident farmers and the largest flock size are found in the northern provinces Badghis, Faryab, Jawzjan, Balkh and Samangan (ASA, 1992) which correspond with information from the pre-war period (Grotzbach, 1990). Sheep are the dominating small ruminants in nearly all areas with goats having a large importance of outnumbering sheep in the eastern provinces of Paktia, Laghman, Kunar, Kapisa, Logar and Nangarhar. The higher importance of goats in those areas is caused by the mountainous terrain and the fodder resources in the forest areas of those provinces. According to the headcount data about 32 percent of the small ruminants are being kept by Kuchis. A similar proportion is cited by Cossins (1994) for the pre-war period. It also appears that more than 50 percent of the horses and camels in Afghanistan are kept by nomadic livestock owners.

Table 2 Summary of total Livestock on a provincial Basis

Province	Cattle	Sheep	Goats	Donkeys	Camels	Chickens	Horses
Badakhshan	317 120	400 521	402 658	107 336	208	314 992	12 996
Badghis	40 873	630 896	275 430	93 857	9 829	243 141	3 190
Baghlan	168 170	332 665	236 127	73 653	770	280 234	19 457
Balkh	74 976	479 323	147 483	58 932	7 474	287 895	9 796
Bamyan	77 893	227 650	60 143	48 905	0	123 432	2 691
Farah	78 525	164 559	493 029	39 848	6 490	438 934	1 849
Faryab	74 967	634 855	353 179	79 228	12 215	187 457	4 394
Ghazni	84 795	246 083	76 266	39 087	721	321 420	840
Ghor	40 354	104 636	40 822	17 415	1	71 391	1 922
Hilmand	184 866	596 074	583 178	52 536	20 247	850 020	2 775
Hirat	185 785	790 708	696 894	155 211	14 088	691 101	4 977
Jawzjan	32 669	440 338	125 146	29 689	15 171	155 470	8 305
Kabul	57 713	91 994	97 140	16 300	356	345 497	491
Kabul City	14 728	10 994	11 534	2 346	0	584 833	1 050
Kandahar	70 286	605 049	390 156	42 756	31 229	579 870	1 263
Kapisa	141 736	90 266	72 270	14 000	270	336 556	928
Khost	164 426	79 924	167 300	30 726	3 040	613 025	365
Kunar	196 990	104 007	433 008	29 815	46	567 032	216
Kunduz	157 898	328 231	49 462	51 721	12 219	236 551	20 012
Laghman	158 359	161 097	163 306	19 831	1 762	391 365	246
Logar	58 748	41 610	30 044	14 436	149	198 365	216
Nangarhar	304 892	267 749	238 991	63 378	3 322	1 046 032	3 362
Nimroz	11 448	65 978	126 315	19 330	9 872	136 657	662
Nuristan	95 892	75 480	559 898	12 821	0	281 504	3 074
Paktika	52 265	104 444	160 663	13 977	4 018	287 518	226
Paktya	85 670	41 292	137 071	16 103	553	472 394	291
Parwan	121 194	149 197	169 947	42 918	137	307 186	2 505
Samangan	42 121	323 416	124 377	67 106	3 247	118 862	5 259
Saripul	63 187	240 893	85 822	60 703	3 198	124 831	4 914
Takhar	236 194	324 031	231 552	139 314	912	345 947	14 718
Uruzgan	229 956	362 503	332 365	74 796	10 967	656 214	7 613
Wardak	56 428	93 937	55 139	31 958	60	268 652	978
Zabul	34 295	161 951	154 151	27 562	2 699	290 467	513
Overall average	3 715 409	8 772 351	7 280 866	1 587 594	175 270	12 155 846	142 094

1.6.2 - Animal Genetic Resources, their uses and technology employed

Very little scientific work has been done to describe the livestock breeds of Afghanistan and their production traits. The limited available information has been mainly collected from the Government documents, state farms or through short term surveys. There are different species of livestock like cattle, water buffaloes, sheep, Goats, horses, donkeys, mules, camels, yaks and poultry.

1.6.2.1 - Cattle

The cattle kept in different ecological regions of Afghanistan show a large variation of phonotypical appearance. They have either small or some of them no humps and show a wide range of colours, mainly black with, some with white spots, brown red, and black and grey. The body weight of the cattle which determines the level of draught performance is also quite variable. The smallest cattle are kept in the areas of the eastern mountains, Hazarajat, Nuristan, Kunar and Badakhshan. The average body weigh of these cattle is estimated about

150 to 1250 Kg. Larger framed cattle are kept around southwest (in Heart, Kandahar and Helmand provinces) and in the northern Afghanistan. Therefore, there are well-known four local/indigenous cattle breeds. They are Kandahari, Kunari, Sistani and Watani. The Kandahari and Kunari breeds are the most numerous and these types of cows are known to be among the best milky/dairy of local cattle in Afghanistan. The cattle are triple purpose animals being used for milk, meat and draught. In some places the smallest cattle are calling by different names like Nuristani, Hazaragi, Afghan-Kabuli, Achi, Shanshansuri, Badakhshani and etc. Confusion is often possible as different names are used to refer to the same breed. The comprehensive and detail evaluation of above mentioned local breeds, which includes the genetic characteristic/ proportion of blood of the basic breed, origin, performance, live weight, conformation, progeny test and reproductive capacity is never carried out in Afghanistan.

Before the war, exotic cattle were kept at Government dairy farms at Kabul, Jalalabad, Baghlan and Helmand/ Lashkargah provinces and bulls produced on these farms were given to rural farmers for crossbreeding. The government farms were looted during the war and the cattle taken to private farms. Around Kabul, Mazar-e-sharif, Baghlan, Jalalabad and probably some other places artificial insemination was carried out with semen from exotic breeds, and the stations at some provinces are still providing services with fresh semen collected from an eleven years old Friesian and nine years old Jerseys bulls. Crossbreeding activities were also part of the Paktia Regional.

The performance potential of these native breeds have a poor growth rate (100 to 150 gram per day), later maturity (age at first calving, 36 -60 months) and low milk production (1000 – 1500 litres in a lactation). The deficiency in milk production is not caused by lack of cattle numbers, but more so by there low level of production. Low productivity is mainly due to incidence of diseases, low genetically potential, low and poor management, inadequate nutrition, low knowledge of the farmers, unorganized breeding, unavailability of sufficient and proper market for dairy products, social unawareness of economic benefits and non-commitment to social change in the society. In any program of improvement they form the care for action. The calving interval is between 15 and 24 months. The milk yield per day of calving interval ranged between one and four litres per day. There are no breed societies which register animals, maintain herd books and ensure purity of breed and its improvement. Most of the cattle breeds that exist today have been evolved one century due to large variation in soil, climate, agricultural practices and trough natural selection mostly for adaptation to agro-climatic conditions, survivability and to a very limited extent these have been selected for milk for draught quality. These breeds have considerable adaptability to local climate, poor nutrition and possess good resistance against certain animal disease and are economically well suited to the areas where they exist.

The main characteristics of these recognized indigenous cattle breeds are as follow:

A - Kandahari

The Kandahari breed is nominated from their genesis place- the Kadahar province. It is the oldest and one of the best native breeds in the country. The Kandahari is larger than other

(Kunari and Watani) indigenous cattle breeds, better adapted to the hotter areas of the south and west, shows such qualities as good constitution, resistance to diseases and produces more milk than Kunari (6- 9Kg peak) and the lactation milk yield can be estimated as 1200- 2000 Kg and the butterfat content is 3.4-4.0 percent with good management. It is the oldest and one of the popular native breed, which have triple-purpose (milk, meat and draught). The lactation period of such cows is 183 days and calving interval is 448 days. In conformation the Kandahari resembles Kunari: the body is long, big, with a light head, long horns, and thin and long neck with few wrinkles. The top line (withers, back and loin) is level with slightly raised hump. The udder is medium in size and cup-shaped. Coat colour is mainly black, frequently with white spots on the abdomen, udder, head and sides of body, light grey animals are also observed. The average measurements of mature cows are as follows (in cm): withers height 120-125 cm, chest depth 50-60 cm, oblique body length 115- 120 cm, chest girth 150- 162 cm. The live weigh of mature cows is 250-350 Kg; bulls weigh 310-400 Kg. The kandahari cattle give good results for crossing with Holstein and Brown Swiss exotic dairy breeds.

B - Kunari

The original Kunary cattle developed in Kunar province were notable for their adaptability and high milk fat content 4.0-4.5% (the best cows produce milk with 6 % fat). But with these valuable features naturally, under extensive management conditions they had low milk yields (it varies from 3.5-6 litres per day and in one lactation period 1000-1500 litres estimated). The daily milk yield of individual cows increases up to 10-12 litres. For this reason they are crossing with the Jersey breed since 1951. On the natural pasture (without supplemental concentrates) the young cattle have a daily weight gain of over 500 gr.

Kunari cattle are noted for their ability to acclimatize in various areas like central and mountainous provinces (Nuristan, Kunar, Bamian, Badakhshan and etc.). This is the good dairy breed, need less feed and economic for small farmers. In summer they trivet on a transhumant system at altitude of 1500-2000 m. These cattle are resistant to infectious diseases due to their strong constitution. The sex mature age is 2-3 years. The basic measurements of the mature cows are as follows (in cm): withers height, oblique body length is 105 cm, chest girth 158 cm withers height is 100 cm. The live weight of mature cows is 150-220 Kg, that of the bulls up to 155-300 Kg. The main cot color is reddish-brown, dark red and white or black and white are also observed. Small body size, the head is light, bright eyes, well developed udder typical dairy type and glandular, the neck thin and short, the back narrow and the skin thin and elastic. The average lactation period is 230 days in average and calving interval is 380 days.

C - Sistani

This breed is found in Systan Lake near the border between Afghanistan and Iran. Its genesis place may be Systan. It is the triple purpose cattle and has a good adaptation with tropical climate. The sex maturity age of these cattle is 3-4 years with medium and large body size. The main cot color of these cattle is different-grey, light brown and etc. It is a small humpback breed with long skin along their neck. The live body weigh of the mature cows is

200-250 Kg that of the bulls is 300-355 Kg. The daily milk yield is 3-5 litres per day with 3.0-4 % of fat content.

D - Watani

The Watani (Native) breed is called for the cattle with their genesis place and created by natural mating in their genetic place. According to the expressions, this breed is formed in the results of crossbreeding between Kandahari and Kunari cattle. The main coat color of this breed is different-black, red, roan, brown, white and etc with different body size- small-medium. The population of these cattle is more than the population of other breeds in Afghanistan. The live body weight of mature cows is 150- 300 Kg that of the bulls is 230-350 Kg. The sex mature age of these cattle is 3-4 years and the calving interval is 350-380 days. The daily milk yield is between 3-4 litres per day with 3.5-4 % fat content. The Watani breed is humpback and some of them are without hump. The basic measurements of mature cows are as follows (in cm): the withers height is 117 cm, oblique body length is 107 cm, and chest girth is 156 cm.

1.6.2.2 - Buffalo

It is not clear that the buffalos of Afghanistan are related to which types of buffalo's breeds, but according to the geographical situation of Afghanistan this species are related to the Pakistani and Indian breeds of buffalos.

According to the available information there are two breeds/types of buffalos which are called large and small types that are kept for milk, meat and drought purposes. The Kunar, Nangarhar, Laghman and Badakhshan provinces in the east and north-east, Baghlan, Kunduz and Parwan provinces in the north and Paktia and Kandahar provinces in the south and south-west of Afghanistan.

However, there are not enough and contentment characterization and information about this types of AnGR in Afghanistan. According to survey and collected information from owners of buffalos, daily milk yield is 6- 10 litres per day with 6-10% fat content and produced about 1500 up to 1800 litres of milk during 9-10 months of a lactation period. The live weight of female is 400 to 450 Kg that of male is 500-550 Kg.

1.6.2.3 - Sheep

Sheep contribute meat, milk, skin, fibre and manure to the agricultural system and help to meet the country's demand for carpet wool, ropes, bags, Kuchi's tents, skins and meat. They are an important source earning to livestock owners, and are the sole, or subsidiary, occupation for many small, marginal farmers and landless labourers, most of whom are poor and engaged in subsistence agriculture.

The Afghan farmers prefer to invest their labour in plant food production; usually sheep and goats are raised as an extra investment, without major labour input, and as an adjunct to a

cropping system. The animals make use of natural vegetation, crop residues, roadside plants and tree leaves, which provide a sizable portion of the energy they consume. Due to intensification of cropping, with irrigation and cultivation of large areas, there has been a progressive reduction in grazing land, resulting in high density of livestock. The grazing lands are thus over-utilized, and investment in their improvement is nil.

The sheep breeds of Afghanistan have been described in detail by Yalcin (1979). The information given by Yalcin for eight breeds, six of which are fat-tailed (Karakul, Ghiljai, Baluchi, Gadic, Hazaragi and Kandahari/ Herati) and two are fat-rumped (Arabi and Turki) is summarized below

1 - The Karakul sheep breed

The Karakul had the largest population than other breeds of sheep in our country (about 30% from the total sheep population is the Karakul sheep and produced 20 million astrakhan pelts per year) before war and five years drought among the sheep breeds and is kept in the Northern provinces from Badghis to Takhar, with the highest concentration in Balkh, Jawzjan and Faryab. The Karakul is a very hardy sheep which is well adapted to the dry and hot climate conditions of northern Afghanistan. They have big and long body, long legs, fallen pelvis, and long rump/fat-tail with the shape of S in the end, long and fallen hear with the colour of black and gray are the main. Turkmen and Uzbek are the main Karakul breeders who often keep flocks of thousand ewes or more. The average live weigh ewes are 42-45 Kg (range 40-55 Kg) and that of rams 50-60 Kg (range 50-90 Kg). The lambing rate depends on the management and varies from 70-85 % and twinning rate is 5-8%. The milk yield during 120-130 days of lactation period ewes produce up to 40-45 Kg of milk. The karakul sheep are primarily kept for astrakhan pelt production. The wool of the adult ewes is usually dark grey and used locally for the production of the carpets.

2 - The Ghaljai sheep breed

The Ghaljai is the second most important sheep breed and is raised in the southern provinces of Ghazni, Paktia, Zabul and Kandahar. It is meaty and wooly type sheep with fat-tail. The Ghaljai has a medium body size and a body weight of ewes is 35- 45 kg and that of rams is 35-50 Kg. The fleece of the Ghaljai sheep is usually white but coloured animals also occur. The wool is heterogeneous and fine. Crossing of this breed with Merinos rams have shown a good result. The Baluchi type of sheep is the result of breeding of Merinos with the Ghiljai sheep. The annual greasy fleece weigh of ewes is 1.5-2 Kg and that of rams is 2.5-3 Kg. The milk yield during 120-130 days of a lactation period is 35-45 Kg. The wool of this breed is of a mixed coarse-wool type. The lambing rate is 70-75 % and twinning rate is 0-2%.

3 - The Arabi sheep breed

The Arabi is the third important sheep breed. It is found in nearly all Northern provinces, but also in Kabul and the provinces north of Kabul. The Arabi is a large-farmed sheep of 45-50 Kg body weight with a good mutton conformation and fattening ability. This is the meaty type

breed with short coarse wool and fatty rump with no tail. The majority of Arabi sheep are black with a characteristic white stripe along the forehead but brown and white Arabi also occur. The greasy fleece weight of this sheep is 1.2-1.7 Kg. But the wool of the Arabi breed is of poor quality. The milk yield of this breed during 130-140 days of a lactation period is 45-55 Kg. The birth rate is 65-80 % with 0-2% twinning. The sex mature rate is 6-8 months.

4 - The Turki sheep breed

The Turki sheep is meaty and fat-tail of sheep. It is tall size with thin and long legs, long and deep head, the nose bone is bulgy, the ears are long and in some of them are short, thick skin, thick and short wool with brown colour and high percentage of fat. This breed is very resistance and can live in desert areas with poor quality feed. This breed is mainly raised in the north-eastern provinces of Parwan, Kapisa, Badakhshan, Takhar, Kunduz and Baghlan. The Turki has a brown coat which resembles that of wild sheep and the small amount of poor quality wool has no commercial value. The annual greasy fleece weight is 0.8-1.0 Kg. It has a large body size and body weight of 50-55 Kg. The Turki is a meat type sheep with good mutton conformation. Large numbers of the breed have been taken by refugees to Pakistan where it is known under the name of Afghani. The total production of milk yield in one lactation period (130-140 days) is 55-65 Kg. The lambing rate is 75-80% with 8-10% twinning.

There is a white coloured breed of medium-size in the western provinces which is called Kandahari, Farahi or Herati according to the provinces of origin. The annual greasy fleece weight is 1.2-1.6 Kg. The total milk yield during 120-130 days of a lactation period is 35-40 Kg. The lambing rate of this breed is 65-75 % with 0-2 % twinning. This breed is said to be a good forager and makes efficient use of poor rangelands and desert-like areas. The body weight of ewes is in the range of 40-60 Kg and the wool is among the best qualities for carpet production in Afghanistan. It seems that this breed identical with the Gadic breed reported by McArthur (1980). McArthur surveyed sixteen flocks in different areas of Herat province and found weaning rates of about 75 percent, a growth rate until eight months of age of 136 gram for male lambs and a wool production of 1.7 Kg/ewe.

5 - The Baluchi sheep breed

The Baluchi breed is kept in the Nimroz province and southern parts of Helmand and Kandahar and also exists in the neighbouring regions of Pakistan and Iran. Like the Kandahari it is well adapted to the arid range and desert areas and produces good quality carpet wool. The annual greasy fleece weight is 1.3-2 Kg. The Baluchi is a medium-sized sheep with average body weight of 34-36 Kg. This is the meaty and woolly type breed. The birth rate of this breed is 60-75 % with 0-1 % twinning. The milk yield during 120-130 days of a lactation period is 35-40 Kg.

6 - The Hazaragie sheep breed

The Hazaragie breed is kept in the mountainous region of central Afghanistan. The region is characterized by good summer pastures but a scarcity of feed during winter when sheep have

to be kept inside. The Hazaragie sheep is of small to medium size and the body weights of ewes is reported to be 28-35 Kg. The colour of the wool is reddish-brown which reduces its value for carpet manufacture.

The smallest breed, both by size and population is the Gadik which is being kept in Badakhshan and parts of the eastern (Noristan and Kunar) mountains. Ewes of the Gadik breed have a body weight of 25-28 Kg, but are said to produce two lambing per year (Bouy and Dasniere,1994). The Gadik produces the finest among the Afghan wools. The annual greasy fleece weight is 1-1.8 Kg. The milk yield during 120-130 days of a lactation period is 30-35 Kg. The birth rate of this breed is 65-75 % with 0-1% twinning.

In the 1950,s different type of Merino breeds were imported and crossbreeding with local sheep initiated on some state farms (Yalcin, 1979), but apparently no efforts were made to test those breeds under field conditions.

1.6.2.4 - Goats

There are four main goat breeds- Asmari or Gujeri, Paroni, Cheeli and Watani or Badakhshani in Afghanistan. The Watani, Paroni and Asmari produce pashmina fibre from their undercoats. Generally information on them is scanty and evaluations are not available. The Asmari is generally used as a pack animal and for meat and milk purposes. Its genesis place is Kunar province (Asmar district) with long hair is used for making ropes and tents, big antler tends to its shoulder. These goats have 120 days lactation period with production of 90 litres of milk. The birth rate of them is 70% and produce 500-700 gr. Hair in a year. The body weight of mature female goat is 45-60 Kg that of male goat is 50-90 Kg and the weight of kit in its birthday is 4-5 Kg. the Cheeli goats are the milky type, which produce 2-3 litres of milk per day. The body weight of mature male goat is 70-90 Kg that of female is 55-65 Kg.

A brief description of Afghan goat breeds has been given by Demiruren (1958). Nearly 80 percent of the goat population is made up of Watani or Native Black goats which are also called Tajiki, Kabuli or Kandahari. They are of small body size and grow under the very long coarse hair cashmere or “down”, which is an undercoat of fine fibres. The Khalej and Khor goat breeds mentioned by McArthur et al. (1979) for the Herat province are probably of the same type. A second distic breed of large goats with small heads on long necks is called Asmari. It is bicolored with white face and body and black neck and shoulders. Apart from this information apparently no study has been undertaken to describe the characteristics and performances of goats in the different areas of Afghanistan in detail. Goats are usually kept in combined flocks, where sheep are the dominating species, but some areas goats make up of the majority in the flocks. McArthur et al. (1979) and Glatzer and Casimir (1983) studied large numbers of flocks in western Afghanistan and found an almost equal number of sheep and goats in the flocks and similar conditions are reported from Kapisa (ASA, 1993). Small ruminant flocks with a large proportion or majority of goats were seen during missions in different provinces and in very different areas. Goats utilize alternative feed sources and are used to lead the combined flocks. According to information from farmers in the visited areas goats have higher twinning rates but also higher abortion rates and losses after birth than

sheep. Glatzer and Casimir (1983) found a lower reproductive rate for goats than sheep (71.5% v. 81.4%).

In addition to meat, goats produce milk, hair and wool. They are normally shorn once a year in late spring and the hair is used for making ropes or the black tents of the Kuchis. Some interviewed farmers in Balkh stated that they never shear their goats. Mcarhur et al. (1979) found 0.5 Kg of hair production per breeding female and Glazer and Casimir (1983) of 0.78 Kg per goat. A farmer from Aqcha (jawzjan) reported average hair production of 0.75 Kg, but this included also the cashmere component of the fleeces. In Afghanistan down fibre are separated from the hair after shearing by hand, either by the flock owners or by workers employed by the wool dealers. The cashmere fibre is mainly collected in the western and northwestern areas. It is also grown by goats raised in the high Pamir areas (Shahrani, 1979), but no information is available but its utilization. Demiruren (1958) found a fibre fineness of 16.6mm and fibre length of 68mm which is within the trade preference (MILLAR, 1986). Efforts by Mercy Corps International (a NGO) to introduce combing of the cashmere before shearing were not successful with farmers in the Kandahar province, because flock owners found this procedure not convenient and appropriate for their conditions (pers. comm. T. Brown, 1996).

All cashmere wool from Afghanistan is marketed through Herat by only three dealers and the total yearly amount is said to be 250 tons. Payment is made according to the proportion of hair fibre in the wool and the price per Kilogram for good quality was up to U\$ 25 (pers. comm. 1996). Farmers seemed to be well aware of the current market price and the quality observed on the Herat market in June 1996 was rather free from hair.

1.6.2.5 - Horses, Donkeys/mules and Camels

Horses, donkeys Mule and camels still play important role as pack or riding animals. The knowledge about different types or breeds and their performance is, however also limited.

1.6.2.5.1 - Horses

There are seven different type/breeds of horses in Afghanistan that are:

- 1- Tooraq- This type of the horses has the dork- brown to brownblack colors. It is very famous type than the other types of horses,
- 2- Samand- this breed has crest, tail and legs with black color until the knee,
- 3- Qazal- This breed of the horses has red, almond, white and blond color.
- 4- Buzkashi- according to the historical sources, its genesis place is Par River of Tjikistan and imported after revolution of 7th October 1919 from Tjikistan to Afghanistan,
- 5- Yargha- it's the type of horses, when is running the voice of all four foots can listen one time.

- 6- Kohband- this breed is keeping in the mountainous parts of north zone of Afghanistan,
- 7- Dawand- the horses of this breed are running faster than the other types of horses, so it's used sport and races.

According to Dupree (1980) the largest horses are found in the Herat region and the highly prized Waziri horses are raised in Ghazni and Katawaz (Paktica). The Northern provinces are the most important area for horse breeding. Horses in that area are of small size with height at withers in Badakhshan of only 1-2m (Bouy and Dasnier, 1994) and they can carry loads up to 90 Kg (Dupree, 1980). For the popular play of Buzkashi prestige horses are kept everywhere in the north of Afghanistan and high prices are paid for such horses. They are among the best horses in the world both powerful and robust, fast and supple and since the eight century the celebrated thoroughbred Arab horses have all come from this region (Michaud and Michaud, 1978). A large trade of horses from Afghanistan to Pakistan is taking place and during the visit to the western provinces several caravans of horses were seen on their way to Pakistan.

1.6.2.5.2 - Donkeys/Mules

Donkeys/mules are of great importance all over Afghanistan. There are two types of donkeys- The big bulk size and the small bulk size. They vary in size and colour such as black, brown, white, blue, black-white and red, and the best breed is said to be raised in Kandahar (Dupree, 1980). Very large donkeys, the size of a small horse, are also bred in Kandahar in the north, which are very popular in Badakhshan (Barfield, 1981). The height at withers of those donkeys is given by Bouy and Dasnere (1994) with 1.3 m. Movements of the donkeys are slower than the horses and can carry amount 80-150 Kg load from 8-10 Km in one hour. Mules are also important animals in Afghanistan and keeping for transport, sport and agricultural purposes and mainly keeping in northern of Afghanistan (especially in Balkh, Jawzjan, Takhar, Badakhshan and Kunduze provinces).

1.6.2.5.3 - Camels

The majority of camels are of the one-humped dromedary type, which can carry loads up to 140 Kg in the mountains and 180 Kg in the plains (Dupree, 1980). They are mainly kept and used by Kuchis, but also rented out to sedentary farmers. This type of camels is keeping in places which have temperate winter and hot summer. This type of camels have light colour, long neck and have short wool. The light colour of these camels is reflexive and keeps the animal against hot. The dromedary camels have two types- riding camels or saddle-camels and burden-camels. The riding camels can carry one person and 50 kg load easily and traveling through 10-15 Km per hour. The physiology of riding camels is with long leg, thin bones and thin skin. The burden camels have short leg, strong bones and concentrated/condensed muscles and can carry 150 Kg load easily and traveling through 4 Km per hour. The dromedary camels compared to the Bactrian camels better using the leaves and foliage of trees and following long distance for finding of feed stuff. These camels have better resistance against thirst and shown good adaptation to hot climate. Some Bactrian

camels are also kept in Badakhshan and Wakhan which can carry loads up to 270 Kg and produce highly valued wool (Michaud and Michaud, 1978).

The selection of camels for breeding, feeding and management in generally are following traditionally and need especially research and studying about their breed's characterization and genetic potentials.

1.6.2.6 - Poultry

According to the headcount data there are 12.16 million birds in Afghanistan which are kept for poultry production. There are four local breeds of chicken such as Kulangi, Sabzwari, Pusti and Khasaki. They are mainly chicken but also ducks and turkeys. The main characteristics of these local breeds are as follows:

1. The Kulangi breed is meaty type and especially kept for sport/fight. The live weight of them are about 4 Kg. The Kulangi poultries are similar with Malay cock. This type of poultry is mainly keeping in north of Afghanistan. The annual production of this breed is 80- 90 eggs. The cock of Kulangi breed has strong constitution/skeleton, growth muscles especially its chest is bulgy and strong, short and thick beak. Some of the author's believes that the Kulangi type of poultry is the result of crossbreeding of improved poultry breed of France with local poultry breeds.
2. The Sabzwari types of chicken are also mainly keeping in north provinces of Afghanistan (Especially in Balkh province) and are smaller than the Kulangi breed. The live weigh of this type of chicken is 1-2 Kg and kept for eggs production and produce more eggs than the other types of local breeds. The annual production of this breed is 100-150 eggs. The main colour of this chicken is green and has a good resistance against unfavorable conditions of climate. Crossbreeding of such type of chicken with improved seedy chicken.
3. The Pusty breed of chicken is the smallest type of local chicken breeds with less production- 80-100 eggs yearly. The live weigh of mature chicken is 1-1.5 Kg. The thin body, long neck and short legs are their main trait and are very similar with Durking of England breed in morphology structure.
4. The Khasaki type of chicken is keeping throughout of Afghanistan and has different colours such as white, black, red and etc. The annual production of this type of chicken is 60-90 eggs. This type of chicken has a good adaptation with local climate and has a better resistance against diseases. The crossbreeding of this breed with improved breed has better results.

After the war Fayoumi chicks have been distributed by several NGOs with priority in the eastern prhovinces. The Fayoumi breed had a successful record as multi-purpose bird for improving village type poultry production in Pakistan and was thought to be the best option for improving that production systeme in Afghanistan as well. Apparently no performance data are available fro the Fayoumi in Afghanistan but several farmers which were interviewed during this mission seemed to be pleased with the performance of the breed. For a large flock (900 hens) of Fayoumi in Wardak the yearly egg production was estimated at about 80, but the management of the farm appeared to be suboptimal. Problems and high losses from

Gumboro disease have been recently reported for Fayoumi birds and NGOs which carry out development programmes are in search for an alternative to the Fayoumi breed.

Beside the chicken breeds, duck, turkey and pheasant also keeping in Afghanistan. But the performance characteristics of these kinds of poultry are not clear and need more research and study.

1.6.2.2 - Opportunity in use and development of AnGR in Afghanistan

The livestock sub-sector in Afghanistan makes a vital contribution to the economy and development of Afghanistan in numerous ways. For the pastoralist and smallholder mixed farmers livestock not only generate income but they are also often the only means of accumulating realizable assets that are necessary to sustain people out of poverty. Livestock are capable of turning otherwise unusable grasses, forages, crop residues and by-products into high value products for sale. Use of these feeds increases household incomes and also provides opportunity for adding value by processing, egg, butter cheese, leather and woolen goods and through strategic marketing that are especially important to women.

So, the opportunity in use and development of AnGR can be summarize as follows:

- About 80- 85 percent of the Afghan population are engaged in Agriculture and Livestock sector;
- High interests of the farmers related livestock development in the country;
- AnGR is an integral part of agriculture with synergistic relationship;
- Livestock provides substantial contribution to GDP;
- Gainful employment, particularly to rural women and youth;
- Presence of mega biodiversity in term of number of breeds adapted to the specific agro-climatic conditions;
- Best Karakul sheep genetic resources of the region;
- An essential requirement to cater the fast growing dietary demand of animal protein;
- Animal-based industrial products;
- Sufficient export potential,
- Human resources and organizational network (through not oriented to AnGR);
- High potential to further increases in production;
- Disease resistance.

1.7 - The main problems in the use, conservation and utilization of AnGR in Afghanistan

The greatest management problem of farm animals in Afghanistan is low and poor quality feed production and low supply of animal feed. As stated above the primary feed resources in

summer is the highland pastures, and in winter it is straw with a little alfalfa and clover hay. Studies have shown that livestock emerge from winter in much worse condition than they enter it. In summer stall feed animals such as lactating cows are provided with fresh cut forage legumes as well as hay from nearby natural pasture. In winter the small amounts of protein-rich legume hay feed is insufficient to meet the animals' needs. Although other feeds and crops by-products are also fed, such as cottonseed cake, maize and barley grain, they are generally in short supply or they are kept for poultry and lactating cows. Roughages include barley-clover mixture, weeds and leaves of mulberry, willow, poplar and Russian olive.

In addition to the pasture used by the Karakul and other sheep and goats flocks in the north, there are also rangelands in the Hasarajat (Nawur in Ghazni province, in Bamian in Yakowlang and others), in Badghis, in Ghor, in Nuristan, in Kunar and Badakhshan provinces. Animals that move to these pastures in summer recover body condition better than those left in the villages due to the abundance and better quality of these pastures. This implies that the feeding of lactating cows that remain in the villages in summer is poorer than the dry and growing stock on the mountain pastures.

Beside that livestock production in Afghanistan suffers from many problems such as New Government, security, low productivity, high population density vs. resources, lack of infrastructure and financing, drought, poor health conditions of animals, animals per household surplus too small, poor knowledge with respect to business plans, lack of access to credit, lack of pricing policy, lack of organized market for live livestock, livestock products and by-products, cultural issues surrounding the sell of products in the villages, limited market linkages between rural and city areas, distribution access, lack of production utilities (electricity, irrigation), no commercialization, no common structure, Food security not commercial, poor hygiene standards and farming practices, lacking skills, lack of legislation and lots of corruption, poor collateral (Ownership problems), lack of cooperative effort, lack of coordination and organized efforts, lack of specific breeding policy for individual breeds of AnGR, lack of legal framework breed societies/ patronage, non-judicious utilization of AnGR, inadequate number of superior breeding stock, lack of adequate insurance coverage of livestock and poultry and other essential services. There is no sanitary control on live animal and livestock production imports, while veterinary inspection of slaughtered meat and other food of animal origin are negligible. Finally, the main and most of the critical problems in the use and development of AnGR in Afghanistan are as follows:

A - The main problems in the use of AnGR in Afghanistan:

- Low productivity potential of AnGR
- High population density vs. resources
- Lack of sufficient and organized market for alive livestock, livestock products and livestock by-products;
- Lack of pricing policy;
- Lack of coordination and organized efforts;
- Lack of a clear/specific livestock policy and livestock development strategy;
- Lack of specific breeding policy for individual breeds of AnGR;

- Lack of legal framework breed societies/patronage;
- Non-judicious utilization of AnGR;
- Inadequate number of superior breeding stock;
- Lack of adequate insurance coverage of livestock and poultry.

B - The main problems in development of AnGR:

- Shortage of trained staff. The technical knowledge of most available staff has become obsolete and refresher courses on practical aspects of livestock production are needed for: 1- Responsible for the formulation and conception livestock development programme (animal breeders at the government level, animal breeders at the university, and heads of animal breeding associations); 2- Responsible for execution of the livestock development programme (Midle level technicians, farm managers/livestock owners).
- Inadequate capital resources;
- Lack of coordination between central government and provinces, between government, donors and NGOs activities;
- Habitat erosion e.g. squeezing grazing land;
- Inadequate extension activities for transfer of technical massages and advises and new technology;
- Inadequate HRD activities specially for the development of AnGR;
- Small herd/flock size and lack of cooperative farming/breed society;
- Illiteracy and ignorance of the farmers to foresee the long term advantage of breed conservation;
- High proportions oh non-descript animals;
- No recording in field;
- Change in the utility pattern of AnGR;
- Poor animal health coverage;
- Poor and low animal husbandry management practices;
- Low quality fodder from arable land;

C - The following specific problems are related to pastoralist (Nomadic/Kuchies) population:

- Pasture access reduced
- Conversion of pasture into rain fed land
- Limited access to veterinary care
- Winter nutrition
- Lack of skills for diversification

- Loss of livestock
- Shortage and lack of water supplies in the pastures
- Lack of a market for animal products and live animals.

Part 2 - Livestock sector analyzing leading to the policy/ strategy for livestock development

2.1 - Past policies for Animal Genetic Resources in Afghanistan

Livestock was always a very important component of the agriculture production in Afghanistan. But this is the fact that Afghanistan never had a strong government and specific policy and implementation strategy for conservation and utilization of AnGR. Most livestock development efforts during the pre-war period were concentrated on the development of public livestock sector (organization, establishment and extension of governmental animals farms for multiplication, extension and production purposes), on the improvement of animal health and scientific studies were mainly carried out to investigate pastoral system. The livestock production systems of private sector and especially of small farmers on the other hands gained little attention and almost no development efforts.

In the 1970's attractive meat prices and prospects for export caused an intensification of the sheep production systems in north Afghanistan (Bafield, 1981) and the creation of a large scale livestock development project in western Afghanistan under the Herat province development Corporation. During the 25 years of war, civil unrest and about seven years of drought caused termination of all development efforts, the destruction of most government facilities and heavy losses of human and livestock. After the withdraw of the Soviet Union troops UNDP and FAO again started to support the livestock sector with the main emphasis on the rehabilitation of the animal health services. Since 1989 a basic animal health care system was established with the help of three projects. The Action Plan for Immediate Rehabilitation (UNDP, 1993) proposed to continue with the creation and support of Veterinary Field Units (VFU) and to implement projects on fodder and feed production, a household poultry package and pastoral system studies. Since September 1997 FAO/Livestock sector started different programs for rehabilitation, improvement and development like in dairy cattle production, Artificial Insemination in cattle, milk collection scheme, fodder production, poultry production and activities with nomadic livestock owners under the project "Livestock Development for Food Security (AFG/96/007)", which was part of the PAECE Initiative (Poverty Eradication And Community Empowerment) and the development of livestock production activities was one of the two objectives of this project.

2.2 - Situation Analysis

As mentioned above, Livestock is a key component in the livelihoods of more than 85% of Afghan's largely rural population. Livestock represent a bank on the hoof, they provide the majority of the draught power available for crop farming, milk and meat for household consumption and sale, manure used as a natural fertilizer as well as a fuel for cooking and heating in the winter, and sale of wool, hides, skins and astrakhan pelts were once very important export earners. The nomadic Kuchi population, which is estimated to be around 1.500 million, is almost totally dependent on livestock for their livelihoods.

Over the past 30 years livestock population in Afghanistan have fluctuated from between about 5 million cattle and close to 30 million sheep and goats down to the current lowest levels recorded in the recent history of the country of 3.7 million cattle and approximately 18 million sheep and goats, due to the effects of insecurity and drought. A similar dramatic decline in numbers took place at the end of the Russian occupation of Afghanistan, when 6 million refugees fled to Pakistan and Iran. However the recovery in numbers between 1989 and 1995 was far more rapid than could be accounted for through reproductive means and improved access to animal health services alone. Much of the “loss” was due to outward migration, and once security improved, both nomads and sedentary farmers were able to bring their animals back.

During that period, the animal health situation has significantly worsened. Contagious diseases (anthrax, foot and mouth diseases, hemorrhagic septicemia, blackleg, brucellosis, tuberculosis in cattle, sheep pox, pasteurellosis and contagious caprine pleuropneumonia in small ruminants, Newcastle diseases in poultry, rabies) have spread out throughout the country while parasitic diseases have increased in all species. In the meantime, new transboundary diseases (rinderpest, peste des petits ruminants, new serotypes of FMD and gombro) have been imported and widespread and zoonotic diseases have received little attention. Although some action have occasionally been undertaken to contain outbreaks (rinderpest was eradicated in 1997), the diseases situation has become worrying in most provinces where heavy losses are periodically reported.

The state veterinary and animal husbandry services today are largely manned by employees of the farmer centrally managed system of the 70's, who lack modern management skills, especially participatory planning skills. Physical damage, looting and lack of financial resources have left these Departments almost totally unable to perform any of their core functions. There is a need to reshape both the Animal Husbandry and veterinary services, in order to separate the roles and responsibilities of the public and private sectors. Both sectors should work in partnership, sharing the responsibility for providing livestock keepers with veterinary services and regulating the provision of services and inputs to provide good quality and safe products for human consumption. The new policy clearly states the role of government will be to formulate policy and development strategy, and act as a monitor and regulator in order to create an enabling environment for the private sector to take full responsibility for production, services and input supplies. The current system of encouraging provincial and district veterinary offices to provide clinical services undermines the process of privatization and will lead to a conflict of interests between the roles of public and private sectors.

From 1988 onwards a subsidized animal health delivery system based on the establishment of Veterinary Field Units (VFUs) was established in much of eastern and southern Afghanistan by the then UNDP/OPS Refugee Rehabilitation Programme. The management of most of the VFUs was taken over by FAO in 1993 and subsidies on drugs and salaries were withdrawn resulting in the collapse of many of them. However, many of the NGO supported VFUs which continued to enjoy salary supplements to VFU personnel have remained active. The question now arises as to whether or not VFUs can continue to provide animal health and production services on a financially sustainable basis in the absence of donor/ NGO subsidy? A critical

evaluation and corrective action through reshaping of the service delivery models is being undertaken by the USAID/RAMP project. The state veterinary service can contribute to the financial viability of VFUs through the award of contracts to perform many public functions that were formerly undertaken by state employed personnel.

A stability returns to Afghanistan there is now an urgent need to reshape both private and public sector delivery systems in a carefully planned process whereby the two sectors form a partnership through innovative institutional and organizational relationships. The proposed EC Animal Health Development Programme and the USAID/RAMP funded Livestock Health, Production and Marketing Improvement Programme to be implemented by Dutch Committee for Afghanistan (DCA) in collaboration with a group of partner NGOs will form the backbone of support to the Livestock Sector for the coming 5 years. These interventions should be viewed as just Phase 1 of multi-annual support Programme which will be required for many years to come in order that a fully sustainable animal health service delivery system can be put in place.

A part of the sectoral reform currently under review, the veterinary and Animal Husbandry Department within the MAAHF will be amalgamated to form an Animal Health and Production Department. This is a rational decision and will greatly enhance co-ordination in the process of improving delivery of public services to livestock keepers. It is important however that the internal structure of the Departments is deeply reorganized in a way which is coherent with the public core roles in both animal husbandry and veterinary fields. The detailed proposals elaborated by the managing staff of the two existing departments should thus be taken into consideration before any decision is taken regarding the final reorganization of the animal health and production department

2.3 - Future demands and trends (animal products)

As in many countries where subsistence agriculture predominates, in Afghanistan livestock perform multiple roles in the household economy. Cattle are essential to provide oxen for cultivation of land and to supply settled smallholders with milk and dairy products, and as a fuel source. Small ruminants provide food in the most important source of income for nomadic and semi-nomadic pastoralist. Sheep are also very important in the settled livestock production systems of the Northern provinces where they produce meat, astrakhan pelts and provided wool for export and manufacture of carpets. Smallholder poultry production is available asset to local population contribution to poverty alleviation, food security and ecologically sound management of natural resources especially in disadvantage groups and less-favored areas.

These goals can be achieved relatively quickly by increasing animal's numbers (very depressed because of the recent years of war, compulsory migrations of the farmers and of drought) and productivity, primarily reducing losses with simple low-cost interventions and with packages of proven husbandry methods. In this context, the establishment of conductive environment for investment of the private sector is essential (i.e. facilitated access to livestock, veterinary credit and extension/ training services). The potential for imports substitution of livestock products is enormous, considering that most of the meat, dairy and

poultry products consumed in Afghanistan are presently imported by neighboring countries, in particular from Iran, Pakistan and etc

The development of improved fodder production and rehabilitation of natural and artificial pasture resources techniques, of optimum strategies for supplementary feeding of sheep during summer and winter, of strategies for optimum combination of pelt and mutton production in Karakul flocks and of cattle crossbreeding concepts are important issues for development which need detailed investigations. Because the necessary applied research and field trials could be done cheaper and equally efficient directly with livestock owners it is recommended not to re-establishment or create Government farms for research or livestock production. The execution of field experiments should be included to the responsibility of the field teams, but additional training and probably more staff is required to carry out this task.

New opportunities will be sought to increase the activities and financial independence of staff at the veterinary field units. The creation of artificial insemination services for cows and of sheep and goats dips along the main migration routs are important services needs and it should be tested, whether they could be provided as commercial service by suitable Veterinary Field Units (VFUs). The development and support of diagnostic laboratories for disease investigation seems fully justified, but careful planning and supervision is needed to insure active performance. It seems important that good cooperation is established between the laboratories and VFUs

The role of women for livestock production in Afghanistan has often been described as very important, but more detailed information have only been published for nomad women. Women are usually involved in milking of all kind of livestock, processing of dairy products, feeding and care of young stock and poultry and processing of wool. Very often women have the main responsible for these activities (Glatzer,1977; Tavakolian, 1984), but an interesting difference in the share of activities can be found in Nuristan. In Nuristan only men milk livestock and prepare dairy products, while women are responsible for work on the field (Edelberg and Jones, 1979). The milking of small ruminants exclusively by men was also reported by Ferdinand (1969) for nomads in east Afghanistan. Barfield (19810 found that women of Arab nomads in north eastern Afghanistan had the full responsibility for setting up the camps, milking, processing of milk and making of felts. In sharp contrast to the nomadic women those of settled farmers remain within their compounds all the time, but their contribution to the management of livestock is most likely very similar to that of the nomadic women.

Development of dairy and poultry production is therefore at the same time an enhancement of the role of women. It is likely that better training in production techniques is important but more information is needed about what women themselves consider important to learn or change.

The future demands and trends can be summarizing as follows:

- Fast growing human population in the country leading to increased demand for animal products;
- Providing employment to unemployed people;

- Providing animal by-product like bone meal, hormones, blood proteins, meat meal, blood meal, surgical threads etc.;
- Wide diversity base for genetic improvement and future security;
- Unique genes for future use;
- Production in low input system;
- Improve socio-economic statuses of the country;
- Have some unique characteristics like:
 - Disease resistance
 - Drought resistance
 - Heat tolerance
 - Ability to utilize coarse fodder
 - Other characteristics like high butterfat therapeutic value of milk/products.

2.4 - Outlining future national policy for conservation and utilization of AnGR in Afghanistan

Draft policy Framework for the livestock sub-sector

As mentioned above, Afghanistan is an extremely poor, highly dependent on farming and livestock raising, Agriculture is estimated to employ 80-85 percent of the population. In 2002 the GDP/per capita was reported to be US\$ 200 with a total Gross Domestic Product of US\$ 4.6 billion of which 53% was provided by agriculture. The current population, estimated at 22.191 million, is overwhelmingly rural. Of the thirty four provinces, that of Kabul contains 23% of the population. The great majority of people are subsistence farmers on small plots of land who face serious food security problems and continue to suffer from insufficient income opportunities, education and medical care.

After almost 25 years of conflict and socio-economic disruption, most of the Afghan governmental institutions are dysfunctional and need serious reforms and capacity building before being able to operate efficiently. The Islamic Transitional State of Afghanistan (TISA) was established in July 2002 to plan and manage the reconstruction of the country. It prepared a National Development Framework (NDF), mean to give a general framework for all sectoral policies, which policies based on a partnership with all stockholders, community participation and a private sector-led growth and development, guaranteeing longer-term food security in the country supported by the three following investment ‘pillar’:

- Humanitarian and human and social capital: The goal of the human and social capital strategy is to create the conditions for people to live and secure lives and lay the foundations for formation of sustainable human capital.

- Physical reconstruction and natural resources: the goal is the effective utilization of external assistance to provide the physical infrastructure that lays the basis for a private sector led strategy of growth.
- Private sector development: the goal is the creation of sustainable growth in order for a competitive sector to become the engine of development and the instrument of social inclusion through creation of opportunity.

In line with these policy guidelines, the Ministry of Agriculture, Animal Husbandry and Food has developed a “Policy and Strategy Framework for the Rehabilitation and Development of Agriculture and Natural Resources Sector of Afghanistan” which attempts to attract and mobilize external as well as domestic support and investment for its implementation, by reflecting the most important national and sector policies as well highlighting the role and responsibilities of all the major stockholders involved in the process of reconstruction.

2.4.1 - Issues to be addressed and priorities

The main issues being faced by the livestock sub-sector are to be classified in three main categories as:

1 - General issues common to both animal health and production

The general issues identified in relation to the development of the sub-sector have been identified as:

- 1- The lack of specific livestock policy and livestock development strategy;
- 2- The lack of co-ordination between Government, donors and NGOs activities;
- 3- The lack of adequately trained personnel in almost all areas of veterinary and animal husbandry services provision either to undertake public or private function;
- 4- The lack of reliable information on the livestock situation;
- 5- The weak organization of the public services and inadequate distribution and motivating treatment of human resources.

These might have been the main reason for the past apparent lack of long term commitment on the part of donors to invest in the reconstruction of the livestock sector.

2 - Issues particularly related to animal health

Issues particularly related to animal health are essentially the following:

- The lack of a diseases surveillance network, of laboratory services to carry out diseases diagnosis and investigation and of an Epidemiology Unit to manage livestock information in such a way that it can inform and feed the planning process;
- The increasing incidence of livestock diseases marked by the recent importation of exotic diseases (Gumboro disease, Pest des Petits Ruminants, New strains of Food and

Mouth disease and etc.) and an increasing incidence of endemic diseases (Anthrax, Blackleg, Haemorrhagic Septicaemia) and zoonotic diseases (Rabies, Brucellosis...) resulting in increased mortality and morbidity and insecurity for the population;

- The lack of quality vaccines produced in Afghanistan because of the unavailability of the necessary equipment, in spite of adequate buildings and some well trained personnel;
- The absence of animal movement control at the borders and within the country due to the lack of quarantine facilities and border control inspections for imported live animals and of facilities for inspection of trade animals in transit within the country;
- Inadequate separation of trade and slaughter animals at markets places allowing for possible contamination of farm animals by trade animals;
- Inadequate slaughter facilities and adequately trained meat inspectors to enforce needed sanitary measures for the protection of consumers;
- The insufficient and outdated legal framework for the control of livestock diseases, the regulation of private animal health service providers, the importation of veterinary medicines, biological products and animal feed, standards and regulations governing meat inspection, the processing of livestock products including slaughter facilities and dairy processing plants;
- The slow progress towards meeting the condition services and input supplies through the donor/ NGO financially supported VFU system.

3 - Specific problems related to animal husbandry

- Poor knowledge and monitoring regarding livestock recording/breeds, numbers, productivity, production and specific characteristics of indigenous/native breeds;
- Poor standards of livestock management, including especially housing and nutrition;
- Periodic lack of pasture or feed linked to frequent droughts and insufficient availability of agriculture by-products which affects production and growth of national herds. This is aggravated by the undue occupation of a number of traditional pasture areas by powerful people (commanders);
- Lack of marketing facilities for live animals and animal products. Farmers have little information on marketing possibilities, particularly for what concerns livestock by-products like hides, astrakhan pelts, skins, wool, etc...
- Inadequate organization of processing and marketing of livestock by-products, including hides, skins, wool, hair and milk products;
- Lack of clear and adapted extension messages and of a coherent extension organization. Even the Department services have little access to extension material. It is thus difficult for them to develop extension themes for the farmers;
- Lack of specific breeding policy and implementation strategy for utilization and conservation of different indigenous/native breeds of multiple species of AnGR,

- Inadequate information on, or access to, genetic material (grade reproducers, semen, embryo-transfer...) for upgrading indigenous livestock. There is a need to upgrade local animal breeds but the department is deprived of the needed equipments and materials;
- The inexistence of research initiatives regarding locally adapted livestock management practices;
- The insufficient and outdated legal frameworks for the control of livestock inputs and feeds, reproduction and genetics, livestock trade, processing of livestock products, etc...;
- Lack of any coherent legislation on land rights, conflict between nomads and sedentary farmers over land rights, severe conflict of interests between winter grazing rights and cultivation in many lowland regions;
- Inadequate financing of animal production investments. Existing financing tools are not anymore operational;
- Insufficient investment in supplementary feed manufacturing (Balanced Concentrate Feed, Mineral Feed and essential Vitamins supplements) ;
- Lack of co-ordination between Security institutions and the Department services, particularly along the boarders.

2.4.2 - Overall and Main objectives

The overall and main goals of the Ministry of Agriculture, Livestock and Food are:

“To increase livestock numbers, livestock productivity and livestock production throughout Afghanistan to provide improved availability of animal proteins to the people and increased revenues and well being of the livestock owners”.

This general objective is to be attained through the protection of livestock against animal diseases and the improvement of livestock raising practices with the three pillars of the National Development Framework.

The specific objectives are that, in the next few years, the majority of rural households practicing animal husbandry will:

- Have improved significantly their animal husbandry practices and raised their level of income;
- Have reached better security regarding health and nutrition of their animals to sustain food security and commercial productions generating farm capital;
- Contribute to the national economy through efficient pastoral and intensive quality productions for national and export markets.

2.4.3 - Policy Issues

The National Development Framework (NDF) outlines key policies for economic growth, improved rural livelihoods, and for sustainable use and management of the natural resources including AnGR. The policies are based on partnership with all stakeholders, community participation and a private sector-led growth and development, guaranteeing longer-term food security in the country. In the context of private sector-led macro economic guidelines prescribed by the NDF, the agriculture and natural resources sector is viewed as the main source of livelihoods for the country. Specific strategies will be designed to insure a steady recovery of economic growth and mitigated hardship among the country.

The NDF clearly prescribes the division of roles and responsibilities between the public and the private sectors as follows:

- The government of Afghanistan ensures security, human resources development, and social justice;
- The government will enable an environment for private sector production and marketing, intervening only where the private sector is not prepared to be engaged and social condition or market failure requires;
- The government will introduce appropriate monetary tools to avoid inflation and provide conditions for opening accounts and insurance facilities to promote and support investment;
- The government will develop and introduce certification and regulatory framework for efficient use of natural resources like water, agricultural land, forestry, rangeland and other sectoral areas;
- The government will, in principle, function as policy and strategy maker, monitor and evaluator of reconstruction and development processes;
- In this overall context of policy guidelines, the policy for agriculture and Animal Genetic Resources sector will be based on partnership with all stakeholders, community participation in the management of natural resources and a private sector-led economic growth;
- Where government interventions are required to design and initiate specific programmes, it will make maximum use of the private sector, NGOs and other actors already present in the field;
- By making use of hydro-technology, the government will improve the non-arable land resources and distribute them to land less and poor farmers for production and investment.

2.4.4 - Role of the private sector:

The private sector will be:

- Actively engaged in the agriculture inputs supply and related services;

- Enable to have access to end use under conditions to be specified of stat-owned and property, market information systems;
- Encouraged and promoted to involve in the production and marketing of agriculture and livestock products.

To achieve the sector purposes will require a range of policy review and reform. A number of key policy reviews are needed, which will build on the NDF identified policy reforms, and a reform agenda prepared with a work plan over the next few years. The policy reviews and reforms will include the following:

- To develop policy and strategies, and sustainable use and management of water resources;
- To develop policy, strategies, and sustainable management practices and systems, including community based management for the crops, forestry, water and rangeland sub-sectors;
- In term of agriculture policy, commercialization of agriculture, food security policy, approach and strategies for improving agricultural services, including agricultural marketing systems, and finance policy, trade, and related efficient land and water resources use and tenure issues will need to be addressed,
- Development a national environmental framework, which will include policy, strategies, regulations and standards to cover all sectors, and to address issues related to sustainable use of natural resources especially AnGR;
- Strategies to facilitate private sector participation and development in the sector;
- Options to develop an efficient and cost effective agricultural/livestock research and technology transfer system, and community development.

In preparing the agriculture and natural resources sector Policy/Strategy framework, an important criterion will be harmonizing the sub-sector policies. Further, given the critical need to establish a policy framework, brief issue based policies will be prepared, which will be revised on a needs basis. Institutional capacity will need to be strengthened to enable effective enforcement of regulations.

The government is committed to promoting the integration of gender equality and advancement of women in to the agriculture livestock sector. To achieve the incorporation of a gender based assessment of planned activities, and implementation of gender strategies and action plans to improve gender equity in all programme and project activities. Vulnerable groups and women headed households are a significant group in rural areas, and project interventions need to target these groups. The government has noted that gender concerns cut across all sectors and programmes.

Wise management of AnGR promotes sustainable economic growth. This will require finding a balance between environmental protections and the commercial development and use of these resources. There is a requirement for integrated approach through a national

environmental framework to include policies, strategies, regulations and standards to cover all natural resource environmental management issues.

2.4.5 - Sectoral Policy and Strategy

In the context of the above mentioned complex of policies a set of strategic interventions is required to achieve the policy objectives in the agriculture and natural resources sector. However, it is worth noting that Afghanistan's problems cannot be resolved over night. Time and patience needed to insure the sustainability of changes that are brought through. Rushing through reforms and transformations with austerity measures will be painful for many people and the government needs to find out the best solutions and the required financial resources if the reform arid transformation processes are going to be successful. Therefore, strategic interventions are required to achieve the policy objectives step by step.

Given the magnitude of problems facing Afghanistan, there will be a requirement to remain flexible in the implementation arrangements. To this end, the government can offer a learning process that can eventually be applied around the country. This will allow the government to experiment with a systematic community level broader value chin approach, rather than isolated interventions.

Change will require time and patience and appropriate mechanisms to adapt and improve management practices in order to make a success, both within the government institutions and the farming community.

In line with the three pillars of the National Development Strategy, the following major strategic interventions will need to be undertaken by the Government in the few years to come and in any case as soon as possible.

2.4.5.1 - Institutional reform

The role of the Government, as articulated in the National Development Framework, is shifting from implementer to facilitator. The Government will aim to optimize the Ministry services support to the sub-sector by increasing their capacity to fulfill their core function: **policy, regulatory, monitoring and evaluation, provision, of selected inputs and services and fostering the establishment of partnerships.** The long- term objective is to decentralize activities that can be delivered best by other organizations, public or private, when they have reached the necessary level of development. Socially accepted norms and regulation will be developed to **balance between market forces and social responsibilities with a view to ensure maximum long-term benefit for all Afghans.** In practical terms, the MAAHF strategy for institutional reform in the livestock sub-sector will include:

- The establishment and maintenance of proper co-ordination mechanisms;
- The rationalization and restructuring of the public services in charge of the sub-sector (veterinary and animal husbandry services) along the Priority Restructuring and Reform and Civil Service Commission (IAR & CSC);

- The design and implementation of better management systems to implement identified core functions of the department concerned;
- The re-equipment of most needed public services infrastructure and services to allow them to operate efficiently.

2.4.5.1.1 - Co-ordination Mechanism

For the livestock sub-sector, as for the agriculture sector as a whole, to maximize benefit from existing programmes and activities, simple but functioning coordination systems are vital. Two main initiatives have been taken at the level of the MAAHF to develop Government Services capacities and improve co-ordination between donors and other stakeholders:

- A Steering Committee has been established at Ministry level to co-ordinate and monitor the main donor's financial assistance and activities in the sub-sector; and
- A Co-ordination Secretariat has been set up in the veterinary and animal husbandry department to centralize information and organize co-ordination meetings between NGOs and the department.

The MAHHF's policy to insure co-ordination of programmes and activities will thus be to develop, regulate and enforce co-ordination mechanisms to allow for maximum involvement of public and private stakeholders and avoid duplication of or compilation between existing development forces.

To meet this objective the MAAHF will use a set of strategies consisting of:

- Confirm the Animal health and Husbandry Steering Committee in its role of overall coordination and guidance for animal health and husbandry programmes in Afghanistan;
- Institutionalize the Livestock co-ordination Secretariat within the animal Husbandry and Health Department to organize and conduct co-ordination meetings under instruction from the Steering Committee, ensure secretariat of such meetings and report results and issues;
- Define, in consultation with the concerned stakeholders, the relationship principles to be applied between public services and other stakeholders (NGOs, private entrepreneurs, services and inputs providers, etc..) in terms of registration, programming, reporting and conditions of exercise of activities related to animal health and husbandry services and inputs supply;
- Develop and enforce adapted legislation and regulations to ensure enabling of a favourable environment for the development of private sector production as well as marketing and services initiatives.

2.4.5.1.2 - Restructuring and reform of animal health and husbandry public services

The Islamic State of Afghanistan has committed itself to restructuring and reforming public administration, improving civil service human resource capacity and civil service pay and grading. The priority Restructuring and Reform (PRR) Decree has for primary objective to enable government ministries, agencies and departments to carry out key reforms that are central to improving the delivery of priority functions and services.

The MAHHF's policy will therefore be to restructure Government's animal health and husbandry services to increase their capacity to fulfil their core functions on the basis of clearly defined modern structures and job descriptions.

To meet this objective and ensure the best utilization of existing human and financial resources, the MAHHF will adapt the structures of the livestock services to the shifting role of Government services from implementer to facilitator and limit the number of administrative units to the functions required, i.e.

Two divisions for veterinary services:

- Diseases control sub-divided into three units (Diagnostic Laboratory services, Epidemiology and Prevention & treatments); and
- Quarantine & Food inspection sub-divided into two units (Quarantine and movements control and Hygiene and safety of animal products);

Three divisions for animal husbandry services:

- Genetic improvement;
- Nutrition & Feed; and
- Animal products & Production sub-divided into three units (Poultry & Fowls, Mammals production and Fish, Beekeeping & Silk worms).

2.4.5.1.3 - Public services management systems and privatization

The new role assigned to Government services will lead to reconsider the functions and management practices presently assigned to Government institutions and services. This involves:

- A change of statute for a number of infrastructures and institutions presently owned and managed by Government and using Government budget and resources to fulfil functions relevant to private sector responsibility. Among these are the vaccine production laboratory and the diagnostic laboratories, the Badam Bagh poultry farm, the Resh Khoor dairy project, the Benehesar Animal Husbandry farm, Artificial insemination services and other production enterprises or projects, which operations are limited by lack of budgetary allocations and administrative procedures and which cannot operate on a commercial basis or expand their activities under their present

statute. Such institutions will be the subject of specific studies to assess their economic and financial viability and sustainability and will eventually be proposed for partial or full commercial autonomy or privatization.

- Reconsideration of the level of involvement and types of activities the public services are expected to develop to preserve the health of animals and ensure quality of livestock products. While concentrating on their core functions and improving co-ordination with the various stakeholders concerned by the sub-sector, the Animal Husbandry and Veterinary department will progressively disengage from activities that can be best implemented by the private sector. Among these are the provision of veterinary services, drugs and private good vaccines, artificial insemination services, provision of feed and grade animals and all production activities.
- The progressive left of subsidies presently applied for services and input supplies by both Government and NGOs throughout the country. The different levels of subsidies and various management practices for the delivery of services and input supplies entertain a sense of confusion and unfair competition which is detrimental to the development of private initiatives. In the meantime, the mere existence of subsidies prevents these potentially profitable services from developing into sustainable activities soundly based upon commercial principles.

2.4.5.1.4 - Rehabilitation of public services infrastructures and equipment

As much of the physical infrastructure and equipment of the animal husbandry and veterinary government service has been destroyed or looted, it is intended to restore infrastructure and equipment that are necessary to fulfil the defined core functions of these services. As indicated in the national development framework (NDF), the approach to physical infrastructure will be based on lessons from international experience. The state will define areas of priorities, but will not be the implementing agency and instead will turn to national and international private sector to design and implement the projects. Particular attention will be paid to the operation and maintenance cost of these projects with a close look on their financial and economic sustainability. As far as the livestock sub-sector services are concerned, these principles will be applied to:

- In the field of veterinary services :(i)the central and regional diagnostic laboratories which will serve both the public sector (as part of a disease surveillance network to be made operational) and the private sector (for confirmation of their clinical finding); (ii) the vaccine production laboratory with a view to expand its activities on a commercial basis and its eventual privatization; (iii)the market place , quarantine stations and check posts needed for the control of animals' movements and borders' control; (iv)the urban slaughterhouse and slabs for quality control of the processing of products of animal origin.
- In the field of animal husbandry service : laboratory facilities for the quality control of animal feed and in general, those infrastructures and equipment which can be necessary in the short and medium term to facilitate the promotion of modern husbandry practices(artificial insemination , import of grade animals or genetic material, hatcheries and day-old chicks production, etc....)

2.4.5.2 - Specific strategy approaches:

While concurrently participating to the same overall objectives, animal husbandry and veterinary services will develop specific approaches inherent to their different nature and the different technological knowledge they involve, inducing specific policies and strategies. Detailed strategy setting is to be a continuous process involving knowledge of existing livestock raising system and practices, monitoring of the livestock situation and evaluation and close co-ordination between stakeholders. It will serve as a base for programs setting and planning.

2.4.5.2.1 - Specific veterinary policies and strategies:

The general objective of the MAAHF regarding veterinary services is to be defined as:

“To decrease the mortality and morbidity of animals through prevention and provision of quality veterinary services and drugs for the treatment of animal disease and to protect humans from contamination by zoonotic diseases and ensure quality and safety of production of animal origin”

In order to reach these objectives, the ministry’s veterinary strategies will be to:

- Develop prevention and control programs to decrease impact of contagious Trans boundary and emerging disease based on modern disease intelligence networks and systems, through improved co-ordination with all stakeholders.
- Create a favorable environment for the promotion and generalization of private veterinary services and drugs delivery.
- Intensify control measures against zoonotic disease.
- Implement throughout the country systematic inspection of products of animal origin.

2.4.5.2.2- Prevention and control of contagious disease:

The department’s policy for contagious diseases is as follows:

“To reduce the impact of contagious diseases on the national herds to acceptable levels in the mid-term and prevent introduction in the country of new emerging diseases”.

Implementing such policy requires that important principles are considered before setting the strategies which may allow meeting the main objectives. As these diseases may necessitate different strategies depending on their own characteristics, their way of contamination, the

resistance of the causative agent and other factors, the department will apply the following principles:

- The approach on a disease control strategy will depend on whether a specific disease is to be considered as a public or private good.
- The strategy will depend on the disease status (endemic or recently introduced), on its prevalence and incidence.
- The definition of the strategy for a disease requires a good understanding of its epidemiology.
- Transboundary disease preferably needs a regional approach.
- Government commitments with international institution (OIE, WTO, FAO...) require that strategies are coherent with their standard recommendation.
- Successes depend on the participation of all interested stakeholders.
- The strategies to be adopted have to be sustainable.

A good understanding of the roles of the public and private sector in disease control is essential to implement the policies.

- The official veterinary services will co-ordinate and promote the setting of the required strategies, organization of the disease detection system and epidemiology services, the control of disease by focal vaccination , movement control, ensure supply of quality vaccine , implement sanitary measures (quarantine of movement control or infected premises, village, epidemiological units) and ensure public and stakeholders awareness.
- The private sectors (NGOs for the medium term and other stakeholders) will ensure delivery of veterinary services, drug and private good vaccines, participate to epidemic surveillance and disease intelligence networks through disease detection and reporting and contribute to control programs (including the use of contracting arrangement).

To meet the general objective, the department will ensure that it has the capacity to mobilize co-operation from all interested stakeholders and gather epidemiological clarification on the main diseases. It will in particular:

- Develop communication and extension aides to train field professional in disease recognition and clinical diagnosis.
- Increase farmers awareness information through participatory epidemiology teams used for extension at the same time as they collect data.
- Improve awareness and organization of traders.
- Determine the impact and incidence of the disease through participatory epidemiology.
- Specify how the causal agent is being transmitted and maintained.

- Find out where are the most important contamination spots and determine the vulnerable point to attack.
- Ensure effective clinical diagnosis and laboratory confirmation.
- Organize laboratory support for surveillance.
- Recommend possible interventions or mandatory control.
- Set up a notifiable disease list and reporting protocol that requires private sector animal health care providers to report listed disease to government authorities.

2.4.5.2.3 - Veterinary services and drug delivery:

The department's objective in this field clearly is:

“To ensure improved access to efficient and fair veterinary services and to quality veterinary drugs and vaccines to all livestock owners where and when needed in the country”

To meet this objective requires compliance with the NDF's guidelines relative to the role of the private sector. The department strategies will thus ensure that NGOs, private animal health care providers and registered stakeholders are:

- Actively engage in the commercial provision of veterinary services and in drugs and vaccines supply.
- Enabled (under conditions to be specified) to have access and use of state owned assets and property.
- Encouraged and promoted to be involved in the exercise of the veterinary professions and marketing of veterinary products.

In the meantime, the department

- Improve co-ordination between public services and private stakeholders and develop a system of partnership based on regular consultation and involvement, participation to disease detection, surveillance, reporting and control programs.
- Develop rules of partnership and promote co-ordination of approaches for services and drugs delivery.
- Encourage private service delivery initiatives, including the use of government assets and contractual arrangements for implementation of certain public services.
- Ensure planning, in consultation with concerned stakeholders, for progressively introducing full cost recovery of services and inputs.
- Regulate and control the quality, safety and efficiency of drugs and vaccines to be authorized for import, manufacture and distribution within the country.

2.4.5.2.4 - Control of zoonotic disease

The department policy regarding zoonotic disease is, in close co-ordination with the ministry of health is:

“To decrease the prevalence of zoonotic disease in Afghanistan and prevent contamination of the population”.

As the clearly are to be classified as public good, strategies to be developed for the control of zoonotic diseases will follow the same principles as those related to the control of priority contagious disease. To meet the set objective will similarly require that the department's capacity be developed to allow for early detection and early reaction regarding these diseases. Strategies will have to be designed according to the specificity of each disease, but epidemiology intelligence will have to be organized concurrently and in close co-ordination with human health specialists. Relevant strategies will therefore imply:

- The development of investigation and laboratory diagnostic capacities as for the main contagious animal's diseases.
- The implementation of public awareness programs to inform the population of the existing potential contamination risks.

2.4.5.2.5 - Organization of veterinary public hygiene

Very little is done at present regarding the quality and safety of livestock products be it for the protection of Afghan consumers or for complying with international standards for the development of exports. The department policy will thus be;

“To organize, regulate and implement quality and safety control of products of animal origin in order to protect Afghan consumers and promote exportation”

As this important function is practically not fulfilled and the needed infrastructure almost nonexistent, the ministry's strategy will depend on the following:

- the conditions which presently prevail regarding marketing and slaughtering of animals and processing of animal products have been carefully reviewed, in particular meat and milk supply of urban centers.
- Traders and distributors have been consulted on the problems they have to face a possible solution.
- A detailed study has been carried out to determine priorities and specify the infrastructure, equipment, training and organization needed.
- An implementation program has been defined, including technical justification, costing and feasibility and possible time schedule to progressively expand veterinary public hygiene activities.

- The veterinary department has been restructured to include a specific division to fulfill animal products control activities.
- Relevant legislation and regulations have been produced to create an appropriate regulatory environment.

Donor will be requested to contribute to the realization of the needed investments for infrastructure, equipment and training programs.

2.4.5.2.2 - Specific animal husbandry policies and strategy

The general objective of the MAAH& F in the field of animal husbandry is:

“To increase and secure livestock population/number, productivity and the national production of livestock products through the promotion and development of improved traditional and appropriate animal husbandry practices and providing regular and assured market for live animals and animal’s products”

This objective is to be reached through the implementation of extension service and development programs in the field of genetic improvement, nutrition and feed and animal husbandry techniques.

2.4.5.2.2.1 - Genetic improvement and management

The variability of the Afghan livestock breeds is described in Chapter 1 in the paragraph 1.6.2. Differences in body size and type traits are obvious, but very little is known about differences between the breeds with respect to other performance traits like fertility, milk production or resistance to diseases. With the exception of pelt type of Karakul sheep even nothing at all is known about phenotypic and genetic variability within the different breeds indicate the natural conditions and the production systems of their main area of breeding. However, livestock breeds are also formed by their owners and it is interesting to see that the distribution of sheep breeds is similar to the distribution of the different ethnic groups in Afghanistan.

The role of animal breeding activities is basically to provide the best animals for the present or those environmental conditions which can be expected in the foreseeable future. Animal breeding can assist a development process by providing more efficient animals for an available production system or new genetic material to utilize improved environmental conditions. All livestock species and poultry can be improved through breeding either by selecting the best animals from within a given population or by crossbreeding with other local or exotic breeds.

It can be assumed that medium-term development process of livestock production in Afghanistan will require both an increase of efficiency and the adaptation of the genetic material to improved management and feeding conditions. Currently there are serious constraints which restrict the implementation of planned breed improvement programme. First

of all, there is no knowledge about the productive capacity of the more important livestock breeds under different management and feeding conditions and serious efforts should be made to start collecting such data as soon as possible. The second important problem is the lack of organizational structures through which a breed improvement programme could be implemented.

The fields with a priority for genetic improvement are probably the development of astrakhan pelts, meaty and wooly sheep, the breeding of better cows for dairy production like Kandahari, Kunari and Sistani and the creation of a semi-intensive poultry industry. Although the former Government structures no longer exist a development programme can be based on a significant number of knowledgeable farmers. There are also many farmers who are interested to invest in dairy production with improved cows and in poultry production. An important handicap for the development of these sectors is the lack of suitable breeding bulls (and/or artificial insemination) and good hens for egg production. It is difficult for the individual farmer to solve these problems and founding a system of support services for breed improvement would be of great benefit. The VFUs are an opportunity to develop this system on a private basis.

According to the mentioned goals, the policy of the MAAHF will be:

"To improve the genetic standard of the domestic herds through selection and preservation of indigenous breeds and well planned importation of chosen high producing exotic animals and genetic materials"

Such a policy implies the implementation of a number of strategies which vary according to the species involved and the nature of production expected, in particular:

A - Cattle and Buffaloes

Genetic improvement will be used essentially '**to increase production of meat and milk according to the regional specificities and feeding resource**'. Strategies will include:

- **The selection** through identification of reproducers and adapted breeding practices of local breeds according to their proven qualities(for example the Kunari breed for the high fat content of its meat, its modest demand in feed and its good adaptation to the local climate) and disease resistance.
- The collection and / or import of sperm for the development of dairy production and the development, with close involvement of the private sector of artificial insemination practices.

B - Sheep and goats

The objective will be '**to increase the national production of meat, milk and specific products like skins, astrakhan pelts and wool to appropriate planned national targets**'. Specific attention will be allocated to:

- The preservation and selection of breeds known for their meat production quality (Ghalijai- Azaragi, Gadic, Baluchi, Arabi....).
- The selection of “dual purpose goat” that could provide both improved carcass for meat and increase milk production (Asmari/Gujari.....).
- The protection and selection of breeds of special interest (karakul sheep).

C - Horses, Donkeys and Camels

D - Poultry and fowls

The department policies will be '**to increase the national production of meat and eggs to develop availability of low cost animal protein for the population and for import substitution**' effort will be made in two main directions:

- The **increase of backyard production** in rural areas through selection and careful crossing of local breeds (poultry, duck, geese, turkeys...).
- The **development of modern poultry farming** (layers and broilers) in the vicinity of urban centers through import and multiplication of chosen exotic strains and investments in hatcheries.

E - Bee keeping

The goal is '**to promote bee – keeping for honey production and cross- pollination**' this is being done through:

- Select of local breeds and extension of reproduction and multiplication techniques.
- Careful imports of queens from exotic breeds for local breeds' improvement.

F - Silk worms

The department objective will be '**to facilitate increase of the national production of silk and increase export of silk worms egg**'. This objective is expected to be reached through the import and multiplication of Japanese and Chinese breeds and the increased plantation of selected mulberry trees.

G - Fish farming

The objective will be '**to facilitate increase of the production and availability of fish protein in Afghanistan**'. This will be sought through the multiplication and development of local species (trout and carps) and study of possible import of exotic species.

2.4.5.2.2.1 - Feed and Nutrition

Shortage of feed and poor quality nutrition during winter has been mentioned in several reports (Yalcin, 1979; Afghan aid. 1995; Leyland, 1994) as one of the main problems for livestock production in Afghanistan and surveyed with sedentary farmers (Barker and Rahmani, 1994; Halimi, 1995) have confirmed that this view is shared by the farmers themselves.

A rough estimate of dry matter supply to livestock in Afghanistan can be calculated from the information given in Table 1 and in fodder production of this paragraph. With about 7.5 million livestock units (LSU) kept in Afghanistan and the availability of 23.5 million tons of roughage the average available amount of dry matter per LSU and year is about 3.1 tons. This amount is equivalent to a daily supply of about 7 Kg for cows and 85 gramme for small ruminants. In addition concentrates are available up to the amount of 55 Kg per cattle and 6.5 Kg per small ruminant. Assuming that goats will normally receive only small amounts or no concentrate the available proportion for sheep can be estimated at 10 Kg and this amount is very close to what farmers from different areas reported as feeding practice.

Even if the animal numbers are slightly overestimated and not all feed resources fully considered it becomes very clear that the available amounts of fodder are a limiting factor for production. The feeding problem is thus first of all a matter of quantitative supply which is further aggravated by large regional and seasonal differences. Mobility of the livestock is one important strategy to deal with these aspects and fodder production from agricultural land another. From the available information it can be assumed that the present livestock systems already make full use of the opportunities from mobility, and that agricultural by-products are largely utilized. There is therefore good reason to believe that a further substantial increase of feed production has to come from extra production from the arable land, either directly from fodder crops or, through increase of production of other field crops and larger availability of agricultural by-products.

According to the above mentioned facts related to animal's feed and nutrition, the policy of MAAHF will be:

"To procure secured and quality forage and feed to domestic animals according to their expected production and nutrition requirement".

This requires that balanced nutrition is ensured through better access and management of natural pasture, development of artificial fodder, encouragement of the use of agricultural by products animal and of feed production for intensive production investments.

A - Natural Pasture

Livestock production in Afghanistan largely depends on grazing, but only about 40 percent of the areas is suitable for grazing during winter (Yalcin, 1979). In higher elevations and mountains with low temperatures and long snow cover indoor feeding is practiced during winter for all livestock and in the uplands northern Afghanistan for large ruminants only. In the warmer areas of south and east Afghanistan all livestock remain outside during the whole

year. Supplementary feeding with fresh fodder crops, hay from pastures or fodder crops, agricultural by-products and concentrates during periods of important production is however common in all areas. It has been estimated that only 12 percent of all Afghanistan could be used for cultivation and nearly 84 percent or about 547000 Km² are pasture land. However, some of the best pastures especially in north and northeast Afghanistan have been converted into agricultural land (Grotzbach, 1990). Large areas of pasture land were also ploughed during the last years by commanders in the Jowzjan province. It is said that the yields from that land become unattractive after the second year and valuable pasture is being destroyed (pers. com., 1996).

The level of productivity of the pastures significantly varies between areas and from one year to another. Assuming an average dry matter productivity of 700 Kg/ha/year and a 50 percent utilization, the total amount of dry matter available from the grassland in Afghanistan can be estimated at about 19 million tons. With the composition of crops and yields as in the pre-war period another 3.5 million tons of roughage from agricultural by-products, mainly cereal straw can be utilized for livestock production.

The department's objective is 'to improve or restore access to traditional pasture, improve their management and reduce risk of malnutrition in case of drought'.

Such an objective implies that:

- Knowledge and monitoring of existing natural pastures is improved;
- Access to water through adapted investment in watering points is facilitated;
- Better management is promoted among users;
- Specific intermediation is developed involving local and national authorities; and
- Co-ordination with other public services (Forestry department, Home office..) is undertaken and environment issues are taken into account.

B - Fodder Production

Fodder crops are a traditional part of most farming systems in Afghanistan and are observed in all areas of the whole country. The most important fodder crops are lucerne (*Medicago sativa*), shaftal (*trifolium resupinatum*) and in the hotter areas of eastern Afghanistan berseem (*Trifolium alexandrinum*). All three fodder crops are mainly fed to large ruminants. Berseem is given fresh and Lucerne and shaftal both fresh and as hay. Lucerne is also sold to other farmers both fresh and as hay. It is grown as a perennial crop, but length of utilization varies between areas from two years to 7-8 years (ASA, 1993). Shaftal is planted as a second crop and mainly harvested in late spring. For the Ghazni province hay yields from four cuts of lucerne were reported as 7-9 tons/ha and from shaftal as 2.5-3.5 tons/ha (ASA, 1993). In some areas up to 10 percent of the cultivated land was under fodder crops in the pre-war era (GROTBACH, 1990), and it seems that after the war fodder production has again resumed an important place in the farming system. Assuming that fodder crops are grown on 5 percent of the arable land at least one million tons of hay equivalent are produced.

No detail information are available about the present amount of concentrates used for feeding of livestock. With the composition of crops and yields as in the late 1970,s the total available amount would be about 500,000 tons per year.

So, the department's goal is 'to increase artificial forage production in order to improve and complement animal nutrition and increase food security during winter and drought periods'. This will be achieved through several complementary strategies:

- Promoters are encouraged to invest in intensive raising practices and animal feed production;
- Agricultural products and feed complements and additives are available locally and/ or easily procured through inputs;
- Feed production technology is made accessible and technical advise provided;
- Feed analysis can be performed locally to control quality and content of feed products.

2.4.5.2.2.3 - Animal Husbandry techniques

The policy of the department of Animal Husbandry will be:

'To rationalize and secure traditional livestock raising practices and promote modern and intensive livestock practices'.

Implementation of such a policy requires that a number of strategies be implemented which include but are not limited to:

A - Traditional livestock practices

- Advice is provided to livestock owners regarding hygiene of animal shelter, watering points and other premises.
- Knowledge of market condition and access to markets are improved.
- Specific productions are encouraged.
- Production of quality and safety of animal products is promoted.

B - Modern intensive productions

- Development of modern poultry farming is promoted where favorable feed and market conditions exist.
- Dairy production is encouraged where favorable feed and market conditions exist.
- Intensive meat production of cattle, buffaloes and small ruminants is promoted where favorable feed, market and animal health conditions exist.
- Extension services are developed to promote honey, silk worm and fish production.

- Promotion of quality animal products is systematically made.

2.4.6 - Human development

Human development rightly constitute the first pillar of the NDf and the lack of adequate training personnel in almost all areas of veterinary and animal husbandry services in both public and private sectors has been identified as one of the main issues Afghanistan has to face. The capacity to implement the defined policies for the sector is therefore vitally dependent on adequate resources and the ministry's policy will logically be:

"To undertake throughout human resources needs assessment study for the livestock sector and ensure that relevant training and extension programs are funded and implemented in the medium term"

Such a policy is to be shared with the relevant government institutions and donors to ensure that all possible national and international resource can be mobilized as soon as possible. Strategies to be developed have to involve all levels of the livestock industry, from the livestock owners themselves to specialized post graduate degree level. They will include in particular:

- The reassessment in co-ordination with the existing veterinary faculties and the ministry of higher education, of the needed intake for the coming ten years period for DVMs and animal husbandry engineers, as well as for assistant and technology level trainees.
- The identification of areas where post graduate specialists are needed and of the individuals who could satisfy the condition for applying to international institutions providing such courses.
- The listing and planning of specific short or medium term external training that are needed to fulfill urgent functions in the public or private sectors.
- The listing and planning of short term courses which could be provided in Afghanistan using international visiting specialists.
- The review of existing training facilities for paraprofessionals and the definition of training standards for such categories of personnel.
- The identification of subject matters which require the organization and implementation of specific extension system.
- The creation of communication systems and media to be used for awareness of farmers or other stakeholders concerned by the development programs.
- It is critical that the veterinary schools develop new strategies for recruitment of veterinary students to ensure regional distribution and to encourage the possibility that graduates might actually be willing to go to the rural areas to conduct veterinary activities.

2.4.7 - Legislation and regulations

Policy can hardly be implemented without an adequate regulatory environment which determines the conditions to sustain them and guarantee the stakeholders of their rights and duties. The existing legal environment was set up in the early 1970's before the Russian invasion of Afghanistan and is in many instances outdated and not adopted to the liberal approach now adopted by the government or fitted to the international context. Moreover, as far as the livestock sub-sector is concerned, new general laws were issued during the Taliban period in 2000, which specifically superseded the former regulations but were not translated into detailed decrees and regulations. The ministry's policy will therefore be:

"To review and renew the livestock sub-sector legislation in order to create an enabling environment for enforcement of the government policies and to secure and promote private sector initiatives and investment".

The laws and regulations which are necessary to sustain the policies and strategies presented above include, but are not necessarily limited to:

- An act on the life of animals which should include in particular:
 - A decree or a set of regulations on animal diseases and notifiable diseases.
 - A decree or a set of regulation on the exercise of veterinary medicine.
 - A decree or a set of regulations on the veterinary pharmacy and biological inputs (Afghan Veterinary Council) Act.
 - A decree or a set of regulations on animals and the environment.
 - A decree or a set of regulations on the prevention of cruelty to animals.
 - A decree or a set of Import and Export (control Act)
 - A decree or a set of Custom Act
 - Wild Life (Protection Act)
 - A decree and a set of Livestock Improvement and Conservation Act
- An act on human use of animals including:
 - A decree or a set of regulations on the property of live animals.
 - A decree or a set of regulations on animal movements and marketing.
 - A decree or a set of regulations on animal products processing, marketing, distribution and export.
 - A decree or a set of regulations on animal feed, supplements and additive Priority in policy development for AnGR conservation and utilization

Issues requiring legal framework for conservation of AnGR in Afghanistan
Also need to be addressed

- Essential Commodities Act

- Animals Movement Policy and strategy
- Control over Common Property Rights
- Some legislation enforcing pedigree breeding and animal recording is essentially required
- An Act of protection of AnGR is required to protect the interests of farmers and stakeholders
- The law should make it obligatory to develop comprehensive animal biodiversity inventories
- Biodiversity within all species

Part 3- State of National Capacity and assessing Future Capacity building requirements

Improvement and development in livestock production should receive high priority for both social and economic reasons and should concentrate on improving animal health and nutrition and increased product processing. In, fact, the livestock sector offers one of the few promising opportunities to improve rural household food security and the reduce vulnerability through income generation, asset accumulation and improved human nutrition. The perspective for the medium-term development is, that higher domestic consumption will increase the demand for livestock products and that this will requires an intensification of the production systems. It is assumed that livestock owners are interested to raise livestock production and that they can be motivated to invest in intensification through increased use of fodder and feed, veterinary services and better genetic material. Technical assistance would be required to accelerate the change through an effective planning and implementation of activities. The most critical problem for livestock is probably the shortage of initiative trained technical staff especially at the under-graduated level. So, livestock development is a state subject and each state of government is preparing its development programmes for livestock and poultry.

The following ministries and organizations are involved in development and conservation of AnGR in Afghanistan:

- Ministry of Agriculture, Animal Husbandry and Food (MAAHF) with Provincial Agricultural Departments and Central Veterinary Diagnostic and Research Institute.
- Ministry of Frontiers and Trible Affairs (FTA)
- Ministry of Labour and Social Affairs (MLSA)
- Ministry of Rural Rehabilitation and Development (MRRD)
- Ministry of Energy and Environment
- Ministry of Higher Education- Universities

Priorities for capacity building to improve understanding of AnGR:

- Training of manpower (who involved in livestock sector and administrative personnel)
- Breed-wise livestock census to monitor status of indigenous breeds
- Characterization work (Molecular level, disease resistance)
- Establishment of Animal Breeding Board in country (Breed releasing mechanism)
- Selective breeding scheme and sire testing evaluation
- Establishment of Breed Society in country
- Performance recording at farmers' level
- Networking of institutions

- Breeding Policy for vertical genetic improvement and conservation
- Documentation of indigenous technology Knowledge
- Legal framework development
- Development of online GIS based information system to act as decision support mechanism
- Providing financial/capital resources

Part 4 – National Priorities for the Conservation and Utilization of AnGR in Afghanistan

Improvement and development in livestock production need high priorities for both social and economic reasons and should concentrate on:

- Food Security
- Poverty Reduction
- Human Resources Development and Employment
- Protection of Environment

Specific National Priorities for the Conservation and Utilization of AnGR in Afghanistan:

- Availability of financial resources for conservation and utilization of AnGR
- Human resources development
- Capacity building of professional staff and who involved in conservation and utilization of AnGR
- Statistic and Characteristic of native breeds (Number, Population and production)
- Development of data base on different native germplasm
- National programme formulation for indigenous germplasm conservation using availability resources
- Legal framework development
- Performance Field Recording, Evaluation and Field Progeny Testing Infrastructure
- Breeding Policy and its Implementation Strategy
- Establishment of Breeding and Breeders Association
- Technological intervention in computational breeding; molecular genetics; embryo transfer; Artificial Insemination (in Cattle, Buffaloes and sheep)
- Technology for the value added products
- Prioritization in Livestock Research and development and laboratory support for research and biotechnological activities
- Genetic improvement programmes in cattle and sheep need a shift from the current emphasis on introducing exotic breeds to utilization and development of indigenous breeds
- Import of quality of breeding materials (Live animals, Frozen Semen, Embryo and etc.)
- Exchange of genetic resources regionally/globally for the development high yielding breeds/varieties to support commercial production system

- Exchange of inf/tech/expertise/resources
- Establishment of an apex body for interdepartmental coordination on activities concerning utilization and management of AnGR
- Inception of livestock production extension services
- Development of regular and assured market for live animals and animals products
- In case of Poultry more efforts are needed for conservation and utilization of indigenous breeds under backyard poultry

Part 5 - Recommendations for international co-operation in the field of farm animal biodiversity

- Higher education in characterization and conservation
- Development of animal recording, evaluation and reporting systems
- Characterization of available non-descript population to breeds and economic valuation
- AnGR- information sharing (offering and receiving)
- Guidelines need to be developed for livestock breeds sharing common breeding tracts between the adjoining countries for sharing of resources and to avoid duplication works
- Strategies should be developed for sharing the benefits on the livestock taken to outside countries for exploiting and harvesting
- The areas of value added products need to be addressed among major international players
- Trained professional and specialized (receiving)
- Materials for genome analysis (offering)
- An international Gene bank should be established in South-east and Central Asia for restoration and development of AnGR of the region
- Farmers/breeders associations at national and international level should to be encouraged for protection of threatened breeds

6 - Conclusion

The political situation in Afghanistan is nowadays more secure which makes possible the development of realistic medium-term and long-term planning of livestock production development. The presence of government institutions and infrastructure for the promotion of livestock production, although institutional capacity building and infrastructure rehabilitation is still needed, offers the opportunity to develop new concepts. The presence of a more functional national government, political stability and personal security are important elements for the development of any concepts for livestock development. As the basis for medium-term and long-term development it is assumed that:

- The great importance of livestock products in the diet of the Afghans will cause that any economic growth and general development of the country will increase the demand for livestock products;
- Livestock owners are interested to raise livestock production, both for higher self consumption and for sale. They can be motivated to invest in the intensification of livestock production and the marketing of extra products could be organized through the presently available channels;
- Except for a few animal products like wool and astrakhan pelts the increased production will be consumed for the time to come within the country;
- In some areas and for some species an increase of the livestock population may be possible and necessary, but a substantial part of the higher production will have to come from a higher productivity;
- Farmers have established forms of management and feeding which were suitable in the past, but need change in the future. Technical assistance would be required to accelerate that change;
- An efficient animal health services is critical to livestock production. Poor animal health is the main reason for losses in livestock production. Better balance between the public and the private sector and between professional and paraprofessional veterinary staff may offer considerable potential to improve services.
- An intensification of the production will require an increased use of inputs like fodder and feed, animal husbandry and veterinary services and better genetic material.

The effective implementation of development programmes for livestock production requires a good knowledge of the predominant local production conditions, a set of proven innovations, tested under the same or similar conditions and a cadre of well trained and motivated staff.

It is evident from the review of the literature and the description of resources for livestock development in Chapter 1.6 that there are many shortcomings in fulfilling these requirements. Only to mention the more important weaknesses, there is only very broad knowledge about the productive potential of the different species and breeds, about the production and use of

fodder and feeds and about the incidence of important animal diseases and parasites. As the first step for development, efforts should be made to fill these gaps of knowledge.

As mentioned in Part 3, the most critical problem for livestock is probably the shortage of initiative trained staff especially at the under-graduated level. Serious efforts should be made to re-open the faculties at first opportunity and information about the urgent needs of equipment and availability or need for teaching staff should be collected as soon as possible. There are many livestock graduates who never had a chance to complete their education or to work in their profession, but even those who had full training before the war have a knowledge which has become obsolete. It is therefore strongly recommended to arrange refresher courses for these two groups. The courses should cover mainly practical aspects of livestock production and a period between six and twelve months may be sufficient. It would be ideal to organize these refresher courses within the country or outside of the country, and the possibility of job offers for the successful participants would surely help to get good trainees. It seems, that with the long break in activities there is risk that a lot of unpublished knowledge about pre-war efforts in livestock development like that about the HLDC and a number of bilateral aid projects is being lost. The collecting of such information would help in the future and could be done as preparation for the refresher courses. Of course the same also applies for the published information some of which is reviewed in this report and by COSSINS (1994).

In addition the public good and private responsibilities under the new Afghan government need to be identified, infrastructure built or rehabilitated and staff trained. Appropriate public sector responsibilities should be based on practical experience in countries and the stage of development of Afghan agriculture, preserving community-based animal health and animal husbandry services which have been functioning over the past two and half decades. Any new government needs to foster the private sector to carry out its responsibilities within a rapidly rebuilding Afghanistan.

7 - References

- Antonio Rota, 2005 Draft Concept Paper (Master Plan for Development of the Livestock Sector). Afghanistan, Kabul, 2005
- Emal M. J., 1982 Performance Evaluation of crossbreed dairy cattle in Afghanistan, M.A. Thesis (cited after Cossins, 1994)
- FAO, 1989 Animal Genetic Resources of the USSR. FAO Animal Production and health Paper No-65 Room, 1989
- FAO, 1989 Animal Genetic Resources Strategies for improved used and conservation. FAO Animal production and health Paper No-66. Room 1989
- FAO, 1997 Promotion of Agricultural Rehabilitation and Development programmes for Afghanistan. Olaf Thieme, Part- Livestock Production, Room, 1996- Page- 1-36. Room, 1997
- FAO, 2001 Educational package on support of development of the Country Report by preparation of the first Report on The world Animal genetic resources- FAO, 2001
- FAO, 2001 Animal Genetic Resources information. Special Issue: Country Guidelines-FAO, 2001
- FAO, 2002 The State of FOOD and Agriculture- FAO, 2002
- FAO, 2003 Regional Office for Asia and the Pacific Publication 1999-2002. Dr. S.P.S Ahlawat Presentation- First Draft Country Report on AnGR- India.
- Gul A. Keshtiar, 1976 Dairy Cattle Feeding and Management Afghanistan, Kabul University, 1976/1354
- G. Habib, 2003 Livestock Scenario in Afghanistan, 2003
- Hanif Padar, 2005 Concept paper on Livestock present situation and Future Policy and Strategy, 2005
- Hakimi Mohd. Zaher, 1989 Sheep and Goat Production Afghanistan, Kabul University, 1998/1368
- Hakimi Mohd. Zaher, 1998 Poultry Production

Livestock Coordination, 1998 Afghanistan, Kabul University, 1998/1368

S.H.Anwari, 2003 Basic of Policy and strategy for rehabilitation and Development of agriculture and livestock and Natural resources in Afghanistan, Afghanistan Presentation on agriculture conference, 2003

Secretariat of MAAHF, 2005 Proposed Draft policy Framework for the Livestock Sub-sector, April, 2005

USAID, 2005 INSIGHTS Agriculture in Afghanistan, June, 2005

UNIDATA, 1991 Afghanistan-Population Estimates by Provinces, Districts and sub-district: A GRAPHIC Presentation, Afghanistan, 1991.