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## Case Study: The Agricultural System of the Konso in South-Western Ethiopia<sup>1</sup>



### Executive Summary

The Konso live in South-Western Highlands of Ethiopia – having to survive in a harsh environment, in a terrain characterised by steep slopes and soils highly susceptible to erosion. The Konso have developed a complex and highly sophisticated agricultural system, which has allowed them to subsist in a mountainous area, harsh conditions and irregular rainfall. Farming is based on an elaborate system of terracing, soil and water conservation practises, irrigation, multiple cropping systems with the integration of live-stock and forestry and crop biodiversity.

The Konso people have lived in isolation for a very long time. Besides the agricultural system a very unique social system has evolved. The generation-grade system was an important part of social life and the community as a whole, making it strong enough to survive in the unfriendly environment.

The inhospitable area forces the Konso to face times of drought and famine, due to climatic change these seem to occur in shorter and shorter periods. They have managed to cope with drought through traditional coping mechanisms. But due to increased population pressure on the limited land resources and the lack of alternative forms of income,

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the area has become very vulnerable. Konso was one of the hardest hit areas in 2000 and many people have to rely on food aid to survive.

In order to improve household economy it is important to create access to cash and non-agricultural income sources. The dependence on agriculture and the inability to create sustainable assets are the biggest threats to the area and result is vulnerability to drought and inability to cope with it. Sustainable development means to support the existing agricultural system, as it is environmentally sound, and improve it through utilising indigenous knowledge, while at the same time keeping the population at a level the production can supply food for.

## **Introduction**

Ethiopia is a country of great variety ranging from lowland savannahs to alpine plateaux, with great ecological and agro-ecological diversity and a very old civilisation. Many of the over 80 ethnic groups of Ethiopia live in the Southern Rift Valley. One of them are the Konso<sup>2</sup>, occupying the highlands of Konso, a relatively small area of ~650km<sup>2</sup> in South-Western Ethiopia, located ~700km south of Addis Ababa. The highlands of Konso run across the Rift Valley, bordered by the Sagan River in the east and south, the great plains of Gomida and Lake Chamo in the north and the Gidole Mountains and the Woito Valley in the west (Engels, 1990).

Fisher (1990) described the highlands of Konso as “green and densely farmed mountains topped by orderly villages and neat round houses, which form an outpost of sedate, evolved culture in the midst of strange, wild country that grows ever more primal and savage as one journeys towards the Ethio-Sudanese Borders.” Beyond the terraced and productive highlands the land slopes sharply downhill giving way to savannah and bush land populated by pastoralists, such as the Boran and Hamar.



*Photo 1: Terraces in Konso with integrated trees (Förch, 2000)*

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<sup>2</sup> The Konso are referred to as ethnic group as well as the region this people lives in.

## Topography, Climate and Soils

Konso is characterised by rugged and stony highlands cut by deep valleys. The main agricultural area ranges from 1400m to 2000m above sea level. This semi-arid, dry and inhospitable place requires immense human effort to survive.

The climate is a dry montane climate. Temperatures are not extreme and vary from 15°C to 33°C (Jahn, 1991). But the area is situated in a dry belt with very unreliable rainfall. Rainfall distribution follows a bimodal pattern (Figure 2); average total annual rainfall is only 551mm (Figure 1), with annual rainfall variation between 300mm and 900mm (Figure 3). The rains are split into two rainy seasons. The big rains are concentrated at the end of February until May and the small rains occur around October and November. Generally rains come in form of violent thunderstorms, which seldom last longer than two hours.



*Photo 2: General impression of the Konso Highlands (G. Förch, 2000)*

The soils of the area are of volcanic origin. Generally these can be described as very fragile and the soil types tend to vary with fertility. In the lower parts near the rivers the soils can be very fertile and consist of fine alluvial deposits. Extremely mountainous and stony terrain and heavy impact of rainfall make soil and water conservation of prime importance. In the heart of Konso hardly any soil erosion is visible, which is a substantial achievement considering the harsh environment and its intensive use.

Figure 1: Total Annual Rainfall (1977-1992) (Watson, 1998)

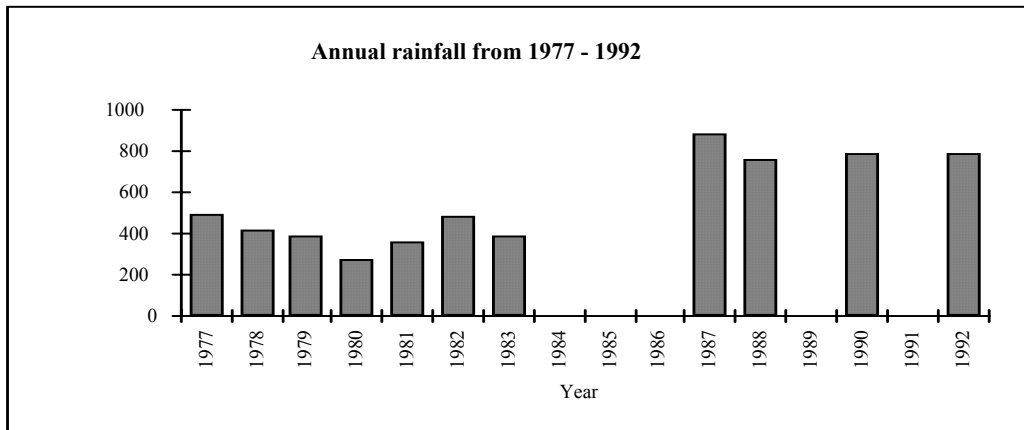


Figure 2: Mean Monthly Rainfall (Watson, 1998)

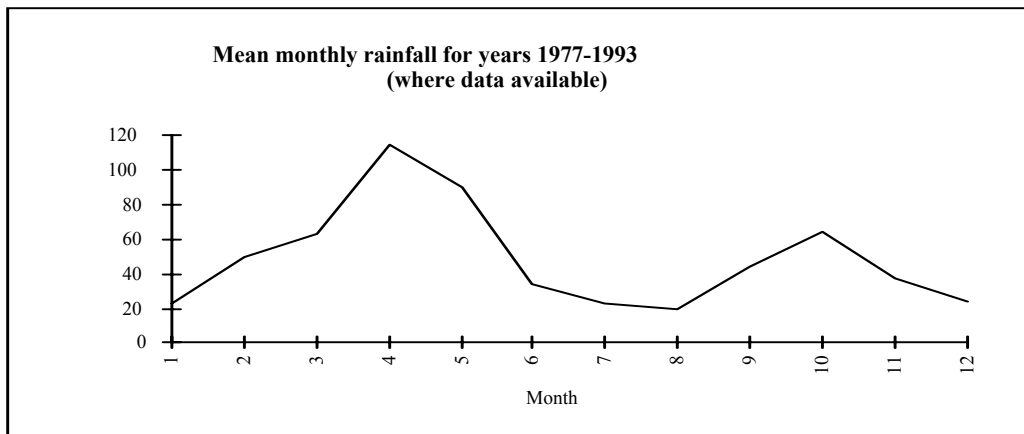
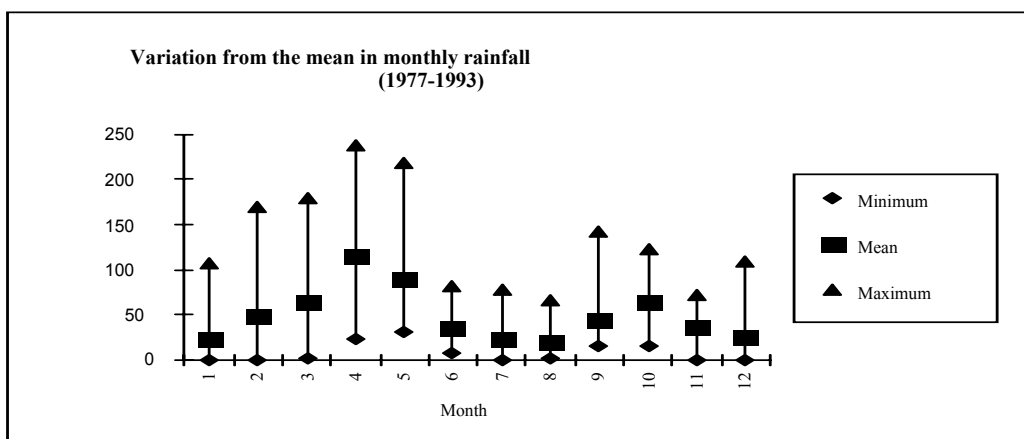


Figure 3: Variation in Mean Monthly Rainfall (Watson, 1998)

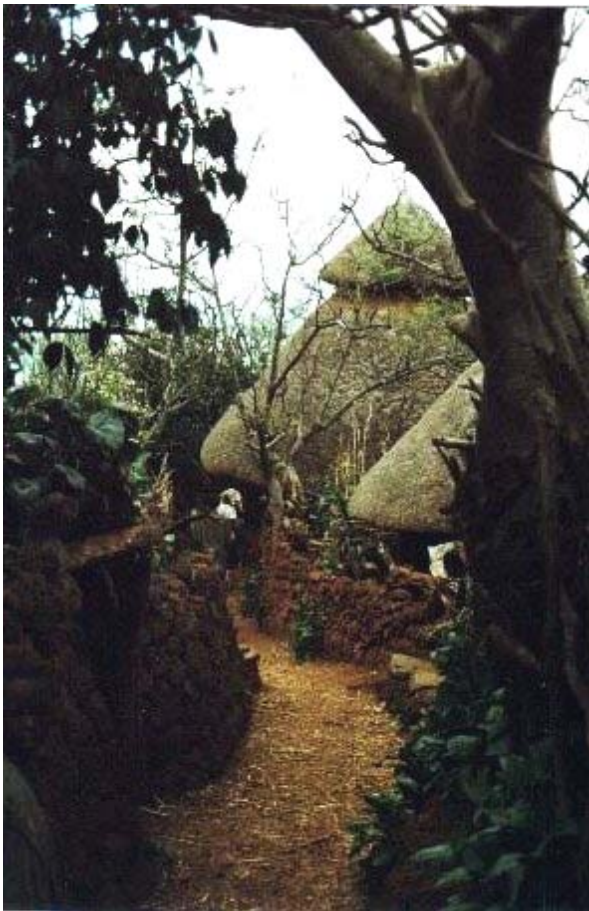


### Population and Socio-Economic Characteristics

The Konso are a small people of about 186,000 (Farm Africa, 1999). The culture evolved more or less under isolation until 1897 (Goettsch, et al. 1984c). The villages, situated on

mountaintops, are difficult to reach and offered good protection against aggressions from outside and wild animals. The choice of settling on mountaintops was dictated by climate (Jahn, 1991)<sup>3</sup>. The higher altitude increases the chance of higher rainfall, less extreme temperatures and allows people to escape the heat, pestering mosquitoes and fevers of the lowlands. The villages are densely populated<sup>4</sup> and surrounded by stonewalls<sup>5</sup>. Fenced homesteads are connected by narrow pathways. The homesteads commonly incorporate a main hut, kitchen, grinding house, granaries<sup>6</sup> and stables. The buildings are located closely together to allow space for backyard gardens. High wooden fences divide the homesteads to allow some privacy.

*Photo 3: Narrow pathways lead through the village, stonewalls separate the individual homesteads from each other (Förch, 2000)*



The first principle of social organisation is the clan. Clan membership is extremely important defining a person's identity and a network of kin relations (Watson, 1998). The village forms a strong unit; each being traditionally autonomous and led by traditional

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<sup>3</sup> The hyeto-graphical line, marking average annual rainfall of 800mm is considered as extreme limit for permanent cultivation, it has shown to connect areas where terrace farming in Africa has been attempted (Jahn, 1991).

<sup>4</sup> There are 35 villages, with an average of 1500 people/village, population density: around 200people/km<sup>2</sup>.

<sup>5</sup> This is a unique practise in Ethiopia, where huts are often scattered across landscape in loose groups.

<sup>6</sup> The granaries are raised on posts about 1m above ground to protect against the damp and rats.

leaders<sup>7</sup> who play an important role in the community. A complex generation grade system was an important part of the social order, controlling population growth<sup>8</sup>. Nowadays, this system is almost completely obsolete, which resulted in a drastic increase in population.

Unlike other Ethiopian agricultural communities the labour division in Konso is more egalitarian (Table 1). Men and women often work together in the fields, but the main labour burden falls on the women<sup>9</sup>.

Table 1: Division of Labour (Watson, 1998)

Male	Joint tasks	Female
- Terracing	- Digging	- Collecting water
- Building, maintaining houses	- Sowing	- Carrying, spreading manure
- Fencing (mainly houses)	- Weeding	- Looking after children
- Dispute settling	- Harvesting	- Cooking, grinding
	- Scaring birds	- Collecting firewood
	- Looking after animals	- Fetching water
	- Washing clothes	- Brewing beer

Traditionally, the land is owned privately resulting in intensive land use and investment into the land. Only the eldest son inherits land, as women cannot own land. Most people own land and depend on agriculture, but also craftsmen<sup>10</sup> are a major part of the society.

Besides these traditional villages there are modern urban-like towns in the Woreda, which provide services, such as schools, health centres and markets. Many Konso who left the villages for employment work and live here.

### Water Supply:

Due to the location on mountaintops, the main problem is the lack of water for humans, livestock and crops. This concern affects daily lives. Especially during the dry season the women are occupied for several hours per day collecting water. Wells are found in steep gorges next to dry riverbeds and carefully protected against flood and dirty water from the river. Perennial rivers are rare. Especially crop production therefore heavily relies on efficient rainwater harvesting.

### The Agricultural System

The inhospitable Konso terrain was transformed by people into a remarkable landscape of terraces and channels, conserving every drop of rain and protecting the soil against erosion. The Konso practise an integrated crop-livestock system. The limiting factors of production are the poor soils, land scarcity and most importantly the lack and unreliability of rainfall. Besides terracing, the most striking features of the agricultural system are irrigation, mulching, multiple cropping and the integration and utilisation of tree species.

<sup>7</sup> Traditional leaders form a council of elders, have political & religious functions, provide leadership for the community.

<sup>8</sup> Getting married and having children was only allowed once one was in the specific age group, depending on the clan women who become pregnant outside this generation grade had to abort the child or move away.

<sup>9</sup> Young men are pressurised into marriage because this brings another highly valued labour force into the family.

<sup>10</sup> Important skills involve weaving and pottery. While visiting the villages one observes mainly old men spinning cotton and weaving traditional blankets, called *gabi*.

## 1. Terracing

Konso farmers are threatened by continuous erosion from their fields and have perfected the art of terracing, which is unrivalled anywhere in Africa. The terraces cover hillsides over hundreds of kilometres and over a height of 700m. Terraces are built with stone-walls<sup>11</sup>. The height depends on the terrain, but especially on steep slopes they are only a few meters wide and can reach a height of up to 6m, although a height of 0.5 to 1.5m is preferred (Engels, 1990).



*Photo 4: Stone terraces (Förch, 2000)*

The dry-stone bench terraces are constructed by cutting soil away to make a perpendicular face and a wall of stones is built against it. Earth is then moved from above the terrace and used to level the part below. On the high flat Konso plateau at an altitude of 2000masl, 10-20cm high earthen ridges subdivide terraces into 9m<sup>2</sup> basins. The main function of all these structures is to maximise water retention and infiltration. At the same time it is very effective in preventing soil erosion.

## 2. Irrigation

Where and whenever possible terraces are irrigated. Runoff is redirected through carefully constructed walls and channels. Stone canals and mud banks take water from rivers onto nearby fields. But there are only few perennial rivers in the area and very little land,

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<sup>11</sup> Farmers can rely on communal work parties of his own and neighbouring villages to construct and maintain terraces, without this cooperative ethic this industriousness would have been impossible.

which is irrigable, making irrigation mainly a form of opportunistic rainwater harvesting (Watson, 1998).

### 3. Livestock

The integration of animal husbandry and intensive agriculture is typical for Konso and is the distinguishing feature to other agricultural systems in Ethiopia. The Konso keep cattle, goats, sheep and sometimes chickens and donkeys. Cattle are either kept on pastures in the lowlands or on uncultivated areas near the periphery of the villages. But the largest number of the livestock is kept in stables in the homesteads<sup>12</sup>. Livestock is handfed and the manure is collected and periodically applied to the fields. The animals are fed stalks of sorghum and maize or the leaves of trees planted in part for this purpose, i.e. *Terminalia*<sup>13</sup> and *Balanites*<sup>14</sup> species. Livestock has multiple roles, it supplies milk to the families; especially children depend on it for their protein intake. It is also raised and kept as an important asset, as it may be sold to generate cash. Livestock can be seen as an important insurance against crop failure and selling livestock to buy grain is an essential strategy for coping with drought. But the main reason to keep livestock is access to fertiliser. Farmers need the manure for rapid re-circulation of plant nutrients on the fields.



Photo 5: Sheep kept in stables within the homesteads (Förch, 2000)

### 4. Manuring and composting

Manuring is a striking feature of the Konso agricultural system. Unlike in many other parts of Ethiopia, dung is never used as fuel. It is an essential part of the system to maintain such an intensive continuous cropping cycle. Manure of animal, and less frequently of human origin, is collected. It is either directly applied to the fields or left to rot in heaps or pits, together with other organic wastes before applied to the fields.

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<sup>12</sup> Livestock in Ethiopia is not kept in stables; free grazing is the main problem causing land degradation.

<sup>13</sup> *Terminalia* species are widespread and indigenous in semi-arid Ethiopia; used as fodder, firewood, timber, posts, poles, mulch or soil improvement. The tree is 7-13m tall, densely shady, foliage drooping (Bekele-Tesemma, 1993).

<sup>14</sup> *Balanites* species, indigenous in Ethiopia are common in the Rift Valley; used for fodder, timber, tool handles, medicine and fencing. *Balanites aegyptica* is an important species for its fruit production (Bekele-Tesemma, 1993).



## 5. Arable

Three cultivation zones can be distinguished, which are extending gradually from intensive to extensive agriculture. This can be seen in the decreasing efforts put into terracing, irrigation and manuring. All land surrounding the villages is permanently cultivated. This inner zone is richly manured<sup>15</sup> and the terraces are well maintained. The intermediate zone receives less amounts of manure. The outlying terraces and lower parts of the terraces are left without manure and fallow land can be seen. Due to the different conditions in these zones it is important that each farmer possesses a piece of land in each of the areas. On average a farmer has at least 10 different patches, each never bigger than quarter of a hectare (Engels, 1990).

The agricultural cycle is very much dependent on rainfall. Land preparations start with the first rains in January/February. Generally, the fields are only worked on once before sowing. Sowing starts as soon as the big rains begin in February/March. Cereals and pulses are broadcasted in a seed mixture and lightly covered with soil, followed by root and tuber crops. An extensive period of weeding and scaring off birds follows. During these months men sleep on little shelters in the fields and during the day they stand on platforms, hurling stones at birds. Harvest takes place in the dry months in May onwards, first roots and tubers, then cereals and pulses, finally in mid-September sorghum. With sufficient small rains in October/November a second crop of maize is sown and sorghum ratooning is practised. This means that the plant may re-grow with sufficient moisture availability in the root zone, following tiller decapitation<sup>16</sup> and a second harvest is obtained in January. Although each succeeding ratoon produces fewer tillers, the second harvest brings essential yields<sup>17</sup> (Norman, et al 1995). The harvested crop is stored in granaries, in the case of maize and sorghum<sup>18</sup>, the heads are hung in the houses.

The main cultivation tool is a double-bladed hoe and to a certain extent digging sticks. Due to the steep slopes and small terraces ploughing is impractical and the plough was not used at all until recently.

Of great importance in Konso is the multiple cropping system with crop, livestock and tree integration. Not only a large number of different species, but also varieties are used. Several species are planted on the same plot at the same time. Multiple cropping systems bring many advantages: more crops can be grown on a small plot with a higher planting density and productivity. The ground is protected through vegetative cover over a longer period. The harvest is spread over a longer period and the risk of total crop loss is minimised. The integration of nitrogen fixating legumes maintains soil fertility and optimises production. A balanced diet is produced and weeds suppressed<sup>19</sup>.

The farmers in Konso are not only innovative in terms of farming techniques, but also in the use of local plant resources and adopting new crops<sup>20</sup>. A great variety of cereals, pulses, root crops and cash crops are known and cultivated. More than 50 different species have been reported from one village, 24 species from a single field (Goettsch,

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<sup>15</sup> Manure is applied before sowing, and also continuously during the growing period of the crop.

<sup>16</sup> Ratooning is also done with finger millet and pigeon pea.

<sup>17</sup> *Fatana* harvest accounts for approximately 70% of total annual harvest, showing the importance of a second harvest.

<sup>18</sup> Ashes of burnt cow dung are used to protect the whole sorghum heads against insects in the granary.

<sup>19</sup> Multiple cropping systems also have some negative effects: weeding is difficult, pests with several host plants can survive, new cultivation technologies and mechanisation cannot be introduced easily.

<sup>20</sup> In 1900 banana, lime, tomato, pepper, papaya, onion, potato, garden pea, cotton were introduced. In 1930s Italians brought pigeon pea, prickly pear, mulberry, orange. Recently, sunflower, sweet potato, lima bean became known.

1984c). These figures are exceptional, compared to other mountain areas of Ethiopia. Additionally, Engels (1990) reported the use of 80 wild plant and tree species for various purposes<sup>21</sup>. The species diversity decreases with altitude, as Table 2 shows.

Table 2: Diversity of species in relation to altitude (Source: Goettsch, et al, 1984c)

Location	Number of Plant Species
1500m (Olanda, village backyards)	40
1750m (Road to Fasa, 0.2ha field)	24
1900m (Fasa, 0.5ha field)	13

Sorghum is the staple crop of the Konso and is said to be ancient in the region, the most important factor is its drought-resistant characteristic (Franke, 1992). A wide spectrum of varieties has been found and at least 24 cultivars are named and distinguished by farmers<sup>22</sup> (Engels, 1990). Sorghum forms the basic diet of the Konso<sup>23</sup>, seeds are ground, the flour formed into balls (*dama*) and cooked in water. Traditionally sorghum is harvested twice during the season, leaving secondary shoots to mature.

Wheat and barley are dominant crops above 1700m, while finger millet is found at lower altitudes. Maize is becoming more important and can be grown at all altitudes, providing enough rain is available. Pulses are important and grown extensively for food and the beneficial effects of nitrogen fixation. Commonly grown are *Phaseolus* species, peas, chickpea, cowpea and lentils. Pigeon pea is an important food, the branches of this perennial are also used as fodder or firewood<sup>24</sup>. Tuber crops are mainly cultivated on irrigated fields. Taro is important for its edible tubers and leaves, especially during times of food shortage. Yam is often planted as a single plant near terrace walls or in gardens. Sweet potatoes, potatoes and cassava are also found. Vegetables are grown, such as cabbage, onion, squash and garlic, but they do not form such an important part of the daily diet. On the same field as the annual crops one usually finds cash crops. Coffee is common, despite the unfavourable conditions. Cotton is grown extensively, especially in lower areas. Spices and oil crops are also found. Another perennial crop of great importance in regions with enough soil moisture is *ensete*<sup>25</sup>.

The Konso maintain an agroforestry system. The cabbage tree is unique in Konso and is intensively used. It is planted densely within villages and more sparsely on terraces. It is a soft-wooded tree with a smooth conspicuous grey bark, feathery foliage with light green leaves and characteristic long pods (Bekele-Tesemma, 1993). It is a multipurpose tree; its' most important function is that it fills a gap in the annual food supply. Especially during the dry season leaves are harvested and eaten as a vegetable<sup>26</sup>. The tree plays a key role in maintaining the ecosystem, by stabilising soil and reducing erosion. The seeds can be used for water clarification, medicinal uses are also known. The Konso traditionally select for taste of leaves and seed size. The trees are looked after intensively,

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<sup>21</sup> Wild species are utilised for food, animal fodder, medicine, building material, magico-rituals, etc.

<sup>22</sup> Farmers distinguish from a set of selection criteria, such as taste, suitability for preparation of food or beer, time to maturity, resistance to fungal diseases, tolerance to a range of soil and moisture conditions, animal fodder, ease of removing husks, resistance to bird attack.

<sup>23</sup> *Dama* is eaten with Moringa leaves. Sorghum is also used for beer, soup and unleavened bread.

<sup>24</sup> Pigeon pea grows up to a 4m high shrub.

<sup>25</sup> A high-energy food, perennial; good soil conservation and in many regions of Ethiopia staple food.

<sup>26</sup> Cabbage and other vegetables are grown during the rainy season.

small trees will be left to grow until they are mature<sup>27</sup>. The leaves are protected against thieves and a thick ring of thorny bushes is put around its stem.

A high number of fruit bearing trees, i.e. papaya, mango and citrus can be found. Fodder trees have been mentioned earlier. Trees are also important resources for firewood, building materials and poles. Villages often contain large reserves of cactus, utilised as fodder and forming an important firebreak.



*Photo 6: The cabbage tree grows within the villages (Förch, 2000)*

The Konso have a well-developed knowledge of wild food plants<sup>28</sup> and these form an important dietary supplement<sup>29</sup>. Their consumption is incorporated into livelihood strategies and considered an important local survival strategy in periods of food shortage, before the upcoming harvest, or when they run out of food stocks. People cope better with erratic and untimely rainfall and drought for several consecutive years without facing severe food shortages, famine or general asset depletion as in other areas of Ethiopia (UNDP, 2000). These so-called famine-foods (UNDP, 2000) would normally not be consumed due to limited seasonal availability, unpleasant characteristics, pro-

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<sup>27</sup> Premature harvesting disturbs development

<sup>28</sup> Plant resources harvested or collected for human consumption outside agricultural areas, e.g. fruits, berries, seeds, roots, leaves, bark and tender parts of the stalks

<sup>29</sup> Daily food consumption pattern generally based on crop harvest, supplemented by domestic livestock products and food purchases (as far as possible).

longed preparation or local taboos<sup>30</sup>. Examples of these are *Acacia* spp., *Huernia*, *Balanites*, *Dobera glabra*<sup>31</sup>, *Portulaca quadrifolia* and *Cadaba*. The wild food plants have to be seen as effective short term coping strategies, but are no substitutes for cereal-based diets.

Honey forms an important part of the diet. Hives are man-made and form cylinders of 1m-length, made of wood, twigs, barks, covered in cow dung, smoked in smell attracting bees and then hung in trees. Hunting is common, although only animals that are associated to domestic livestock are consumed<sup>32</sup>.

### **Principle Constraints to Biological Production**

The highlands of Konso are densely populated and population is growing rapidly<sup>33</sup>. The pressure on land is increasing, resulting in marginal lands to be taken into production and problems resulting from overstressing the farming system<sup>34</sup>. The erratic climate and harsh conditions make agriculture in the region very difficult. Traditional methods of water harvesting are essential. Lately, also in average years the region is considered food deficient. Declining soil fertility and growing population increase the pressure on limited land resources and people are unable to hold large stocks of food, which would help them cope with periods of food shortage. Pressure on the resources also led to decline in trees<sup>35</sup>. The Konso identify water as the major constraint. There is a critical drinking water shortage (Farm Africa, 1998).

The major problem is the increased vulnerability to drought and famine. Since the 1940s famine hit Konso every 10 years, since the 1960s the time span seems to have lessened. Today the trend is worsening with famine occurring every 2-3 years. The area is experiencing major problems at this moment and was one of the worst hit areas of the drought in the Horn of Africa in 2000<sup>36</sup>.

### **History of the Recent Drought**

Drought and famine in Konso do not happen by accident. Droughts can turn into disasters with massive loss of life and serious reductions in household assets, which in turn lead to further impoverishment of the community. 1995 was an exceptionally good agricultural year with enough supplies to sustain the population to the next harvest. But since 1996 the area is drought stricken and was confronted with repeated and significant crop failures and harvest losses. In 1998 the big rains failed and less than 4000t of cereals and pulses were harvested in 1999, compared to 18,000t in 1998 (WFP, 1999). Until June 1999 most Konso people managed to cope with these conditions and survived by consuming wild food plants and selling assets (UNDP, 2000). But after three severe

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<sup>30</sup> Ethiopians do not consume wild plants or animals due to religion, but here people are still living with indigenous traditions and beliefs and most diets do comprise of wild products.

<sup>31</sup> Is also a local drought indicator plant, new shoots grow during the dry season and if rains are delayed enhanced leaf production can be observed.

<sup>32</sup> Hunting is highly prestigious, as long as it involves lion, leopard and python hunting, not many of these are left.

<sup>33</sup> Rapid increase in population could be led back to increased decline of traditional values, i.e. decreasing importance of the generation grade system. This is my opinion based on my observations during several trips to Konso since 1995.

<sup>34</sup> Decreased soil fertility can be observed, but also lack of maintenance of terraces, where again impacts on the social system from outside (especially through European missionaries) have to be thought of

<sup>35</sup> Indigenous trees are disappearing due to the introduction of charcoal production. Charcoal production was unknown until some two years ago, but now is a welcomed off-farm income opportunity.

<sup>36</sup> During my visit in Jan. 2000 fields were in a terrible state, I have never seen it that bad before. People were receiving food aid distributions from donor agencies, which was not observed from me in Konso before. The area normally impressed through the strength to overcome food shortage problems that are so common in other areas of the country.

years another harvest failure in 1999 was too much. From the 29 villages in the Konso Special Woreda 23 were very severely affected and more than 100,000 people were in a high-risk situation. After such a long period of drought traditional coping mechanisms<sup>37</sup> were no longer possible and food aid was the only way out. Many families now live on the borderline between survival and dependence on food aid. WFP (2000) has calculated that in the Woreda 190,000 people would require food aid, 31,416 households<sup>38</sup> are assisted by employment generation schemes<sup>39</sup>. Until September 2000 full food aid rations had to be delivered and seeds provided for the next planting season.

The current situation is as follows. Many families are taking part in Food-for-Work schemes<sup>40</sup>, which is going on for ten months now. For two weeks of work one receives 50kg of grain. It has just rained recently, but it was not enough and the major part of the sorghum plant that is left in the ground for ratooning did not survive the long dry period. Harvest prospectuses are rather depressing.

### **Conclusion**

The key to survival, soil and water conservation and food security in Konso is the unique agricultural system of the area. For many generations the Konso lived in harmony with their environment. The customary system held the population in balance and nature was treated with respect. The Konso have accepted the state of affairs and have made the best of what nature has given them. Over many generations the Konso have developed an elaborate system of terracing and effective conservation practises, such as mulching and a complex and flexible cropping system. There is a complex relationship between population growth and environmental change and even the intensive and environmentally sound methods of cultivation have not saved the people from disasters.

The difficult agro-ecological conditions show how remarkable it is that so many people can be fed from this limited area, when appropriate farming methods are applied. But the current drought clearly shows the vulnerability of the area. The biggest struggle faced by the Konso people is to cope with these situations more effectively. Emergency response capacity building is, for example, one of the main objectives of Farm Africa<sup>41</sup>.

What would sustainable development mean in this context? First of all it has to include strong local involvement and initiative. Development has to involve the whole community in planning, implementing and maintaining schemes. Looking at the agricultural system, one has to build on the indigenous knowledge of soil and water conservation. There might be scope to increase agricultural production in the lowland areas by utilising seasonal streams more efficiently. Farmers' experience and local knowledge has to be combined with the knowledge of experts from other regions and extension workers.

Farm Africa runs a project introducing high-yielding goat crossbreeds. Milk increases the nutritional status of the household and cheese can be produced. The animals have a high breeding value and form an important asset that can be sold in times of needs for cash.

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<sup>37</sup> Coping mechanisms are family sharing and borrowing, consuming wild food crops, these are short-term mechanisms and by no means work over a longer period. People would also seek work by migrating, but people said that the drought was so widespread and that there was nowhere to go.

<sup>38</sup> 143 000 people.

<sup>39</sup> A common way in Ethiopia to distribute food aid without giving free donations (Food-for-Work), in order to create less dependency from relief food.

<sup>40</sup> Constructing terraces, roads, ponds and other highly labour intensive works.

<sup>41</sup> A British NGO working in Konso since the early 1990s.

The people have to have income and assets they can rely on in times of need. Non-farming income generation is important to reduce dependency on a good harvest. Supplementary income is especially important for vulnerable households, i.e. female-headed households. Gender issues have to be considered more strongly, since women are the main working force in agriculture.

The need to leave people with a strong asset base to strengthen their ability to cope themselves is essential. On a national and local level the right policy environment has to be created to ensure that when droughts hit, correct decisions are made with farmers at the practical level to enable them to be more prosperous in good times, while planning for and surviving the next drought (Farm Africa, 1999). One has to build a more sustainable and robust agricultural base that is better able to withstand the occurrence of drought.

Besides agriculture many other issues of rural development have to be tackled in order to create sustainable livelihoods. Access to drinking water, improved sanitation and appropriate medical supply are necessary.

But one should also consider what the region has to contribute to the development of other semi-arid areas in Ethiopia and other developing countries. The terrace system and multi-cropping system has a long tradition and this knowledge can be of great use in other areas. The use of multipurpose trees and small-scale irrigation could be an important contribution of Konso to the future development of the country and should be adopted elsewhere. The multiple cropping system offers a very high degree of genetic variation and Konso is one of Africa's hot spots of biodiversity.

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