MILKING HEALTH: A PASTORALIST'S VIEW

Gedo Region of Somalia: Researching in the Field and from Remote

Technical Report on a One Health Operational Research in the framework of HEAL

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Disclaimer: this research was conducted independently by CCM as one of the requirements under the project HEAL. The opinions based on the findings in the report and annexes are those of the authors and do not necessarily represent those of CCM and their consortium partners.

Reference Project: One Health Units for Humans, Environment, Animals and Livelihoods (HEAL); inception phase (March 1, 2019 - May 30, 2020), VSF-Suisse, CCM-Italy, ILRI, CGIAR, 2019.

Time-span of research: November-December, 2019

Focal locale of mission: Gedo Region (North), localities inside the triangle Dollow, Beledxaawo and Luuq, and satellite settlements, Somalia

Note about spelling in Somali

The language family of the Somali is Afro-Asiatic→ Cushitic→ Lowland East Cushitic→ Somali. It has a standard spelling, written in Latin character. Anyhow, field researchers – even if they speak or are Somali – have difficulties in transferring from ear to paper the complex sonority of the Somali language their informants use. The Somali phoneme inventory consists in 7 to 10 vowels and 22 to 31 consonants, depending on the linguistic analysis; sometimes, the brief vowels are almost inaudible between hard consonants or at the end of the word.
Thus, even Somali-born speakers transcribe names and words in different forms (e.g., see the spelling of the town Beledxaawo, aka Balat Hawo or Bullahawa). Furthermore, Somali is a tone language with some properties of a stress system. Tone is both lexical and morphological; the inflectional function of tone is the more prominent of the two roles. This is notably atypical of most African tonal languages.
We tried to uniform the Somali spelling of localities and nouns: all mistakes are by the authors.[1]

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[1] Modified and extended by the authors from http://hooyo.web.free.fr/E_chap01.html.

List of acronyms and abbreviations

AS – Al Shabaab (The Youth)
ASL – Above Sea Level
BCE – Before Common Era (formerly BC, Before Christ)
CCCM – Camp Coordination and Camp Management
CCM – Comitato Collaborazione Medica
CCPP – Contagious Caprine Pleuropneumonia
CEDA – Community Empowerment and Development Action
CGIAR – Consultative Group for International Agricultural Research
CL – Community Leader
DC – District Commissioner
DCA – District Community Affairs
DHO – District Health Officer
DMO – District Medical Officer
DTM – Displacement Tracking Matrix
FAO – Food & Agricultural Organization
FPIC – Free Prior Informed Consent
FSNAU – Food Security and Nutrition Analysis Unit
HC – Humanitarian Coordinator
HEAL – (OH Units for) Humans, Environment, Animals and Livelihoods
HIVOS – Humanist Institute for Development Cooperation
HMIS – Health Management Information Service
IDP – Internal Displaced Person
ILRI – International Livestock Research Institute
INSO – International NGO Safety Organisation
IOM – International Organization for Migrations
IUCM – International Union for Conservation of Nature
LA – Local Authority
LTA – Long Term Average
LTM – Long Term Mean
MoAH – Ministry of Animal Health
ODI – Overseas Development Institute
OH – One Health
OHU – One Health Units
OR – Operational Research
PA – Project Area
PLW – Pregnant and lactating Women
RO – Research Operator
SES – Socio-Ecological System
SWALIM – Somalia Water and Land Information Management
SYPD – Sustainable Development and Peace Building Initiative
UNEP – United Nations Environment Programme
UNFPA – United Nations Fund for Population Activities (now United Nations Population Fund)
ToC – Theory of Change
VSF-Suisse – Vétérinaires Sans Frontières Switzerland
WFP – World Food Programme
WHO – World Health Organization

CONTENTS

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EXECUTIVE SUMMARY

During the inception phase of the project aimed to implement One Health (OH) Units for Humans, Environment, Animals and Livelihoods (HEAL) in the Greater Horn of Africa, CCM (a partner of the consortium) implemented a OH Operational Research (OR) in the Gedo Region, Jubbaland State of Somalia. Based on anthropology and human ecology, the OR was designed with an innovative methodology in the field and from remote (3.4). The overall objective was to investigate the perception about health in the OH domains (human, animal, environmental) amongst nomadic pastoralists (2 types), agro-pastoralists, urbanised pastoralists and destitute pastoralists (IDP).

After a gap analysis and literature excursus, a set of baselines and preparatory results were developed before, during and after the OR in the field and from remote. Some of them are:

- Scales in health seeking-behaviours (Section 1), by which, through the networking of a community, individual agents do not become collective patients.
- Definition of the pastoral human terrain (1.2) in the Region, with the "cameline paradigm" discussed; the consequent "opportunistic pastoralist" and multi-variated strategies are connected to density variations (1.2.1) due to migrants and refugees. The local situation is porous, with livelihoods changing values (from socio-capital camels to cash economy), type of community (from nomadic to aggregate to urban), model of economy (meat and fodder for cash sale), scheme of nutrition (from proteins to starches), kinship (from closed clan to exogamous marriage), all this according to circumstances, in a "pendulum aggregation" where social change is liquid.
- The cultural concept of "body" implies values like religion in the health scenario of the Region (1.3); in a sequence, illness is recognised at household level (disorder) → the head decides action → a sacrifice is needed (a-life-for-a-life reconstruction of order) → sacred people are called in (sheiks as moral regulators) → biomedicine is approached. After the disorder of disease enters the household, the sick person is moved and transduced from religion to biomedicine.
- A series of "scapes" is identified (Section 2): bodyscape, lifescape and landscape.
- There are connections between patterns of disease and patterns of culture (2.1). The anthropologic approach identifies these processes about livelihood (2.2), and an anthropologic OR recommends appropriate health policies, deepens understanding of disease causation and treatment, and promotes more effective actions to enhance health, helping prevent disease at upgraded scales and values than biomedicine by itself.
- A proactive environment surrounds pastoralists, feeding them and their animals, that in turn interfere with habitats. What characterizes Gedo zone is change (2.3). The variation is visible in clan composition, population-density increase, policies and constraints against nomadism, diminution in herd size, shift from camels to sheep and goats, change in urbanisation patterns. In October 2019, the area received unpreceded rains, with extensive floods and abnormal vegetation growth. For the good or the worse? Change, and not the "norm", becomes our informative benchmark.

In Section 3, a full description and discussion about this OR is provided. A first result is that a OH project for pastoralists should move along four trajectories: i) pathway to health; ii) pathway to water and pasture; iii) pathway to communication and social relationships; iv) pathway to modernity. All these paths tend to the future and therefore to change (ToC).

The OR's primary objective is to provide a decision support system to project designers. So, non-quantitative systems such as tradition, personality, survival strategy, relationship with animals and environments are to be studied. This OR was meant to lead towards a development *from* local conditions and not *to* prefabricated objectives (3.1).

First thing, a project area (PA) was defined (by and with the local assistant Issack) in the triangle Dollow, Beledxaawo, Luuq, with 5 ecosystems and relative settlements (3.2):

- Lowlands (seminomadic pastoralism): Malkariyey, Beledxaawo District
- Highlands (nomadic pastoralism): Sullale, Luuq District
- River and alluvial plains (agriculture and mixed economy): Bantaal, Dollow District
- Small towns and peri-urban belts (services, markets, modernity): Tuulo Amin, Beledxaawo District
- IDP camps (totally artificial and alien to surrounding livelihoods): Kabasa, Dollow District

Following the line to the future (both for pastoralists and researchers), we chose a system implemented by journalists in hostile zones: the stringer/spotter relationship (3.3), by which information is gathered and diffused geometrically, from the ground to the editor. Making use of Internet communication, we elaborated and implemented an innovative and replicable remote-tutored field-mission methodology, meant to follow, monitor and pilot step by-step the activities in the field, the quantity/quality of gathered data, their reporting and two-way elaborations. The tutoring was achieved by a continuous flow of information from/to an expert anthropologist and a Somali public health operator, knowledgeable about local health systems, communities' social background, local people's behaviours and customs, environmental criticalities.

The metaphor is the tree. At the roots, there is the research operator, an anthropologist who can "tap" scientific knowledge for the tree growth. He trains, guides and monitors all the stringer/spotter field-activities and data. The trunk is the field researcher (the stringer), who passes information up and down the tree. The branches are the groups of people involved by the stringer (called spotters), who grow from the stringer and relay back information to trunk and roots. The leaves are all the pastoralists involved in the OR: they transform light (Somali culture) in energy (decision-making), giving strength to branches, trunk and roots.

In the specific northern Gedo situation, we did not use single spotters, but five Household Spotting Units (HSU), composed of members from the same family in each environment. That way we partially managed to deal in a single go with topics related to adults, youth, children, and age plus gender. We developed an algorithm in 14 steps and managed to keep it going: it worked. The first phase saw the anthropologist from remote providing the stringer with 5 Training Units; he answered and received comments; in the second phase, the stringer in the field held meetings with local authorities and chose the 5 HSU. In the third phase, the data flow was activated and maintained. The main constraint was the short time (rapid assessment) and not the insecurity (Al-Shabaab activity) (3.4).

Out of the sequences of the OR in the field and from remote, with more than 200 people directly involved (visibility for about 6000) we got direct information (field) and indirect analysis (remote), both reported in Section 4. We diversified individual questions and FGD topics according to the supposed differences in habitat and economy, but outcomes were quite uniform in all locations (4.2). The local situation (innovative methodology, short time, security, routine precedents, diffidence, desire to please) determined a form of standardisation in the respondents' answers about health in all three OH domains. Keeping in mind the criticism about the disaggregation of the OH components (3.1), we decided to anyway operate a tripartite subdivision of data, going against the due entanglement only for simplified, reductionist reporting.

The data coming from the field are not enough for any statistical analysis; they highlight anyway the conformity of perception towards the health of people, animals and environments, even in wording (although this may be an outcome of a "lost in translation" effect (4.2.1, 4.2.2 and 4.2.3).

For instance, the most common diseases according to the interviewed families were common cold and dengue. Updated at October 2019, the top 10 diseases at Dollow Health Centre were: 1) Acute Respiratory Tract Infections; 2) Pneumonia; 3) Malaria; 4) Urinary Tract infections; 5) Diarrhoea; 6) Sexual transmitted infections; 7) Intestinal parasites; 8) Skin infections; 9) Dengue

fever; 10) Tuberculosis. Dengue, the most feared disease according to our respondents, ranks only ninth. An interesting fact is that both among the IDPs of Kabasa and the local population there was no self-indication of "iatrogenic diseases", those generated by wrong practices and treatments by the health personnel (4.2.1).

About animal health we found out that, confronted with pre-October 2019 data by VSF-Suisse, some diseases remained common (CCPP and worms), while others were not in the list any more, above all those of an 'unknown aetiology' (4.2.2). There are also discrepancies in the perception of livestock diseases. For example, while common cold (*hargab*) in humans is not considered serious, CCPP (*hargab*, the same word used for both people and animals) is to be cured at all costs, vaccines included. Killing livestock diseases, like anthrax and meningitis, are perceived like 'from the old days' and 'eradicated', even if an informant admits that he remembers cases from only 'three years ago' (4.2.2). Another important point is the fact that animal diseases are believed to be "imported" by migrants and improper livestock management during transhumance (overcrowding, mixing, poor control). Here we see the "invasion syndrome", typical of high-density locales (1.2.1.).

All respondents about the environmental issue seem to minimize climatic change: it is not perceived as a crisis (like it is), but a temporary variation in the season pattern, a weather phenomenon the pastoralists are well acquainted with. Agriculturalists are more knowledgeable about soil destruction, while pastoralists are predictably worried by fluctuations in rainfall (4.2.3). All agree about loss of nutritional power in plants and the disappearance of edible wild fruits, but global warming is far beyond any control by pastoralists, and not only ('Allah's will').

Considering all limits, the experience in the field and from remote provided diversified results: some positive, some neutral (no additional knowledge), but none utterly negative. The derivative is a future-oriented guideline towards the exploitation of 5G communication technology (Section 5 and 3.3) to implement ameliorated, environment-specific, community-controlled replicas of this innovative operational research in the field and from remote.

Focus group discussion in Bantaal, December 3, 2019 (courtesy of Abdi Issack)

SECTION 1 – MILKING HEALTH

1.1 – SCALES TO HEALTH

The One Health (OH) Operational Research (OR) in the field and from remote in the Gedo Region, Jubbaland State of Somalia, is conforming to the project framework aimed to implement OH Units for Humans, Environment, Animals and Livelihoods (HEAL) in the Greater Horn of Africa. The HEAL project is based

> on the assertion that, despite the huge challenges that have hit the Horn of Africa in recent years, its people, livestock and natural resource base provide a firm foundation upon which to improve livelihoods and increase resilience. Pastoralist communities depend on the close interlinkages between rangeland, livestock and human health. This insight and understanding provide an ideal basis to apply a One Health approach to tackle one of the key bottlenecks for pastoralists which is access to necessary services and inputs. The HEAL project will build on this foundation by supporting a bottom-up approach which is participatory, context-specific, coordinated and integrated to reshape service delivery in the form of One Health Units (OHUs).[2]

An unresolved problem comes from the ability to perceive the pastoralists' point of view about *their own* health and that of their livestock. Furthermore, in this report, the generic concept itself of "pastoralist" is under critique (see below 1.2.1); we have rather to consider the population of the Gedo Region of Somalia – where our anthropologic research was performed – as composed of "pastoralists and their derivatives".[3] In the area, conflict is permanent and extreme events (due to climate change) hit the population, twisting the so-called "traditional" livelihood trajectories. For instance, the *deyr* rains of 2019 – unrecorded before in their values of deviation from the long-term mean, LTM+150 mm in October[4] – produced floods that affected the full spectrum of pastoralists, agro-pastoralists, agriculturalists, destitute pastoralists and urban populations.

In such an unpredictable environment and mutant society, health is a matter of scale. Scale, from individual self-care to health-providing structures and State health policies, is a lens which we can analyse any behaviour of the socio-ecological system (SES) components regarding the wellbeing among pastoralists.[5]

The framework of observation and research, as per CCM's long standing approach, is the One Health (OH) paradigm.[6] The OH approach recognizes the complex and holistic interrelation of human, animal and environmental health; its proposed health systems aim to the development of combined multidisciplinary interventions designed to reduce and address health risks. CCM, with the assistance of one of the extensors of this report as a Technical Advisor, implemented

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[2] AA VV, *One Health Units for Humans, Environment, Animals and Livelihoods (HEAL)*; inception report for the opening phase of the project (1. March 2019 - 30. May 2020), VSF-Suisse, CCM-Italy, ILRI, CGIAR, 2019.

[3] Throughout this report, words between "xxx" are evidenced by the authors or are article titles in footnotes, while between 'yyy' indicate direct wording by respondents or quotations from literature.

[4] FSNAU, "Somalia Rainfall Performance, Jan 2001-Nov 2019: Deviation from Long Term Mean (LTM)", available in https://m.reliefweb.int/report/3428613, lastly retrieved in December 2019.

[5] Salza A, *Cloudless Skies and Whistling Thorns: Global Threats to Pastoralists and Livestock: Environment in One Health Perspective*, report on the research in the project "Emergency intervention to support drought-affected populations of Filtu and Dekasuftu, Liben Zone, Somali Regional State of Ethiopia", CCM, Turin 2018.

[6] For the main relevant literature on One Health, among many others see: Coker R *et al.* (2011); Day MJ (2011); Galaz V (2014); Jones KE *et al*. (2008); King LJ *et al*. (2008), Lee K & Brumme ZL (2013); Osburn B *et al* (2009); Zinsstag J *et al*. (2006, 2009, 2011). The relevant literature review and bibliographic details are in Villanucci A *et al*., *Enhance the Health Status of the Nomadic Pastoralists in Filtu Woreda, Liben Zone, Somali Region, Ethiopia.* One Health Operational Research, CCM Report, Turin, April 2016, to which one of the authors was active party.

interventions of "One Medicine" among the nomadic pastoralist in the Somali Regional State of Ethiopia (Liben and Gode zones) in 2004-2005. The activities were followed in 2016-19 by the elaboration of an "augmented" OH model, utilising the disciplines of medical anthropology, human ecology, veterinary and human biomedicine, ethnography, plus all the available data on local knowledge and practices.[7]

When speaking to the local herders, we managed to get information about the biuniqueness of the human-animal health dipole. Beware: the pastoral truism "If livestock are well, people are well; and if people are well, livestock are well" is asymmetrical in the pastoralists' perception and actions. The herder, even if ill,[8] cannot leave her/his animals; therefore he/she would consider his/her personal health at a different trophic level from the one of livestock. At the same time, livestock diseases might affect the whole community at a great speed; therefore, animal health is preponderant in the scale of pastoralists' decision-making, being it economic or social.

At individual's or household's scale, the perception of human diseases among Somali pastoralists of the northern Gedo Region (like in other pastoral areas of Africa) is surprisingly low. When questioned about the principal human disease in their household, most of the times the respondents say: '*Hargaab*, common cold', while their animals are worrying the herders 'because of worm infestation (*gooryaan*)'[9] and the ubiquitous *hargab*. Note: the same word is used for a disease in humans and one in livestock, mainly goats. 'because symptoms are the same: running nose, cough and headache (*sic*)'.[10]

On the other hand, we have to consider health in a wider cultural framework: according to Islamic religion and "magical" belief (common to many African health systems), disease 'comes from Allah' (or evil spirits), or by a combination of social envy and individual wrong conduct. The religious matter is of the utmost importance among Somali pastoralists: that is why visiting holy places and reciting the Quran are the drivers to the first up-passage of scale in health seeking-behaviour. Therefore, admitting to be sick implies the difficult steps of accepting first thing God's wrath, and then considering malevolence by neighbours or personal misbehaviour.

In health-seeking behaviour, the question of scale and the pastoralists' perception of wellbeing mingle in a tree-structured model:

At the grassroots level (micro-scale) – the one of individuals in their family households,[11] being the household the indivisible fractal unit of Somali pastoralists[12] – health is considered according to circumstances (grazing seasons, distance from health facilities, cash availability, religious imperatives, social status, among others) and not directly to the severity of the disease.

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[7] For a OH simplified model among pastoralists, see Salza A (2018), *op. cit*. The author developed a critique of the One Health paradigm in Salza A (ed.), *Don't Ask, Don't Tell. One-Health Seeking Behaviours among Pastoralists in a Semi-arid Land*, Technical report, CCM, Turin 2019; Ch. 4.

[8] In medical anthropology we refer to the triad "illness", "disease" and "sickness", where illness is the individual and subjective experience of the event; disease indicates the body's dysfunctionality or pathology from an organic/biological point of view; sickness denotes the social dimension of the problem, *i.e.* the way each society conceptualizes, manages and gives meanings to it. The triad shows the multidimensionality of the health phenomena, often underestimated by biomedicine, that considers only the "disease". See Augé M & Herlzlich C (eds.) (1983), *Le sens du mal : anthropologie, histoire, sociologie de la maladie*, Paris : Editions des Archives Contemporaines.

[9] See Focus Group Discussions in Malkariyey and Tuulo Amin, as reported by OR's stringer Abdi Isaak on December 4, 2019.

[10] Household Spotting Unit's interview, Malkariyey, December 12, 2019.

[11] Somali pastoralists consider the household's internal perimeter (*raas*) as the nuclear family inside the *reer* (lineage group), that lives in and moves with the nomadic hut (*aqal*). See Lewis IM, *A Pastoral Democracy. A Study of Pastoralism and Politics Among the Northern Somali of the Horn of Africa*, Africana Publishing Company, New York 1982; p.56.

[12] Salza A, *Gedo Region of Somalia: Researching in the Field and from Remote*, preparatory paper for HEAL inception, CCM, Torino 2019; p. 11.

At the health-facility level (medium scale) – the one of assistance-seeking household members and of community health workers – health is a compromise between need and availability of drugs, plus knowledge, access and supplies. Between the sick person and the community health worker, we must also consider the religious "emergency rooms" (sacred places like mosques and Quran reading) and the traditional herbalists/healers.

At the Region's public health service (macro-scale) – that of decision makers engaged in formulating health policies and guidelines – health is a paradigm according to exogenous sets of values and protocols (biomedicine, WHO, modernisation), usually rejecting any bottom-up modification.

Summing up:

1. At micro-scale, the individual's health is not considered, and the household routine and consequent livestock care are prevalent.
2. At medium-scale, a specific and reliable interface between the community and the first-level health worker is the limiting factor about health knowledge and disease control/cure.
3. At macro-scale, the top-down, "health productive" public system ignores local cultural hindrances, and singles out undifferentiated individuals.

In this structure, the individual changes resolution – from micro to macro – according to his/her performance inside the Somali society's constraints about health/disease, that, in turn, precede and shape the individual by its institutions and health systems.[13] The Somali society might have a strong pre-architecture, inserting children and adults into a defined case of knowledge and prescriptions about health, but *negotiation* and *performance* provide a feedback *to change* the society and the lived environment.[14] This impermanence of society and culture permits the individual to perform at the different scales of his/her "perceived health", passing with ease from traditional healers to Quran reciting, from personal ties with community health-workers to hospital referral.

To reinforce a more efficient health-seeking behaviour among the Somali pastoralists in the northern Gedo Region, the above health-ladder must be understood and upgraded by refining all steps: i) the bottom-up does not make miracles, so the individual herder must be helped by a health-conscious household *cum* livestock; ii) at the medium level of the community health-worker, the health system needs two hands, one reaching the individual and the other importing from biomedicine; iii) in the top-down approach, the public health-system needs to pass from vaccination campaigns, disease awareness and centralised cure-facilities to a more flexible and custom-made set of healing procedures for pastoralists and derivatives.

The continuum individual-society, passing through the networking of a community, is the space-time framework where individual agents do not become collective patients.

1.2 – HUMAN TERRAIN

The main goal of any health-related intervention is the upgrading of the health systems of individuals and populations in distress, in order to feel at ease with a degree of "health serenity".[15]

[13] Wolf ER, "Inventing Society", *American Ethnologist*, Vol. 15, November 1988; pp. 752-61.

[14] Full discussion in Hinde RA, *Individuals, Relationship and Culture. Links Between Ethology and the Social Sciences*, Cambridge University Press, Cambridge 1987.

[15] The concept was elaborated by Salza after an experience in Burkina Faso, where a "food serenity" model was developed in 2012 at Ouagadougou, during the meeting Erasmus Solutions in Cooperation (ESC) with Yelamani (local NGO); food, like health, must be available, safe/sane and certain/secure.

To achieve this goal it is imperative an appropriate knowledge about the human populations and their future life-paths in the operational environment, as defined and characterized by sociocultural, anthropologic and ethnographic data, plus other non-geographical information.[16] This is intelligence enabling capability; it is meant to help design "nudges"[17], gentle pushes towards health and consequent development. According to a widely accepted axiom, the human territory in the northern Gedo Region of Somalia is pastoralism. Is that valid still?

Pastoralism is a key characteristic of the Horn of Africa. The first evidence of this survival strategy in the area is given by rock-art, starting from four to five thousand years ago.[18] Paleo-environmental and archaeological data suggest that this was a time of major environmental and demographic fluctuations. These conditions make the macro-region an informative area for modelling the relationship between environmental, economic and demographic variables in the evolution of pastoralism in the Horn.

Nowadays, approximately 20 million pastoralists live in the macro-region and create significant migration flows. They move seasonally, often crossing porous borders in search of water, grazing lands, better livelihoods or simply safer socio-environments.[19] Population displacement caused by push factors contributes to mixed population patterns in the fast-changing humanitarian context of the Horn. This macro-region is now one of the major refugee-producing and -hosting places in the world. Nomadic pastoralists, although mobile by lifestyle, can also become displaced due to conflict and natural reasons, such as droughts or floods (a recent, highly feared disaster[20]), becoming the so-called "destitute" pastoralist amongst the millions of IDPs of the Horn.

In 2014, the UN estimated the nomads of Somalia to be 3,186,965, or 25.9% of the population. They are supposed to follow a fusion-and-fission model.[21] Under normal circumstances, in Somalia herds are concentrated around water sources during the *jilaal* (dry season from January to March), and are driven to pastures in the interior during the *gu* (rainy season from April to June). External circumstances and increased pressures on pastoralists – such as climate hazards and conflict – can lead to irregular movement patterns and involuntary displacement of pastoralists, potentially fuelling further conflict and displacement.

Delivering even basic health services to these mobile groups presents a significant challenge for governments, humanitarian agencies and NGOs. While catering to internally displaced people and refugees may be relatively less difficult in the structured setting of a camp, providing the same health services to nomadic groups scattered across the different ecotones is a much more complex task. There are logistical challenges, such as the availability of mobile cold chains and transport accessibility, before creating community awareness of and demand for health services.[22]

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[16] The term "human terrain" has military origins; it is controversial in anthropology, but useful in scenarios of conflict or extreme events; see Kipp *J et al*., "The Human Terrain System: A CORDS for the 21st Century", *Military Review*, September–October 2006: pp. 8-15.

[17] A "Nudge Theory" was elaborated by the economist Richard Thaler, considering innovative ways of changing public behaviour by soft "pushes"; this led him to win the Nobel prize in 2017; see: Thaler R, *Nudge. Improving Decisions about Health, Wealth and Happiness*. Penguin, London 2009.

[18] Brandt SA & Carder N, "Pastoral Rock Art in the Horn of Africa: Making Sense of Udder Chaos", *World Archaeology*, Vol. 19, No. 2, October 1987; pp. 194-213.

[19] Anand S, "Overview of mobile populations in the Horn of Africa", UNICEF ESARO, Nairobi 2014.

[20] 'A ranking exercise near the Dawa River put Flood as the most feared disaster. Environmental and sudden issues, like fire and flood, appear to be perceived more aggressive then the long-term or alien-produced events like drought or conflict', in Salza A, *op. cit.*, 2016 and 2019.

[21] *Ibid.* (2019), par. 2.4.

[22] Schelling E, Weibel D, & Bonfoh B, *Learning from the delivery of social services to pastoralists: Elements of good practice*, Swiss Tropical Institute, Basel, and IUCN, Nairobi 2008; lastly retrieved on December 9, 2019 from https://www.iucn.org/content/learning-delivery-social-services-pastoralists-elements-good-practice.

The species of livestock involved in nomadic movements are obvious limiting factors to pastoral mobility. Regarding the Somali pastoralists, there is a "cameline paradigm", according to which camels[23] are the favourite and most diffuse domestic animals in the area.[24] By the way, that is why we chose for our cover the picture of a camel being milked. This representation of camels is similar to the Sahara sand dunes: they enter 90% of the imagery, but cover only 10% of the surface. Camel preponderance may be still true in the perception of most Somalis and foreigners, but at a finer scale, like in the northern Gedo Region of Jubbaland State, the situation is different. A veterinary technical report[25] states:

> A decrease in the herd sizes was witnessed in cattle, camel, donkeys as well as poultry. Most of the losses were in the range of 1-10 animals, with cattle recording the highest decrease. […] Most households owned more sheep and goats [shoats, aggregated] compared to the other livestock species.

Two years later (2017), in another report from the same source it was related that 'camel herd sizes showed a uniform decrease in three ranges of (-1 to -20%), (-21 to -40%) and (-61 to -80%)'.[26]

This does not mean that Somali nomads do not rely on their camels anymore, but simply that pastoralism in the Gedo Region is changing its structure according to environmental, social and individual constraints and choices. For instance, one of the households involved in our research, considered to be "hilly environment pastoralists", reported to have 'goats, sheep, two cattle and one donkey'.[27] Donkeys are increasingly becoming key pack-animals, substituting camels: they carry water and guarantee load-transport to sedentarising pastoralists, especially to women. In our field research in northern Gedo, donkeys are always cited as part of the household's livestock. They may even become ambulance movers, like reported by Nuria: 'If the patient is very ill, we refer to Dollow health-centre using donkey carts for transport'.[28]

All in all, the above figures about the number of livestock in a household are evidently too low: according to a UNICEF paper of 2013, 'in six Somali regions, herd sizes were low, with households of six people owning an average of 8.1 camels, 7.4 cattle, 37.5 goats and 27.3 sheep – below what is considered minimal for subsistence for households of that size'.[29]

In an outdated analysis of the most vulnerable groups in Somalia (2002), the northern Gedo Region was considered prone to 'extremely high malnutrition rates', because 'large livestock moved out of the Region, with return prevented by insecurity'.[30] Since then, the camel supremacy, faced with conflict, insecurity, displacement and climate change, is crumbling down in Somalia.

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[23] The Middle East, the Sahara-Sahel belt and the Horn of Africa support a high population of dromedaries (*Camelus dromedarius*); they have one hump while, in Central Asia, proper camels (*Camelus bactrianus*) have two. About Africa, notwithstanding the difference, the use of the English word "camel" is prevalent, even in scientific literature.

[24] Hjort af Hornäs A & Hussein MA (1986) *Camel Herd Dynamics in Southern Somalia: Long Term Development and Milk Production Implications*, Camel Forum Working Paper No 13, Mogadishu 1986; pp. 1-32.

[25] VSF-Suisse, *LLRP Baseline survey report, Gedo Region of Southern Somalia. Focusing on Veterinary medicines or vaccines, Livestock, Irrigation and Water supply infrastructure Sub-Sectors*, Nairobi 2015; pp. 26-27.

[26] VSF-Suisse, *A rapid assessment report of the potential in current drought situation for the different model of destocking in Gedo, Jubaland, Somalia*, Nairobi 2017; p. 21.

[27] Focus Group Discussion, Tuulo Amin, 04.12.2019.

[28] Spotter's interview, Bantaal village, on December 15, 2019.

[29] UNICEF, *Enhanced enrolment of pastoralists in the implementation and evaluation of UNICEF-FAO-WFP Resilience Strategy in Somalia*, Nairobi 2013; p. 9.

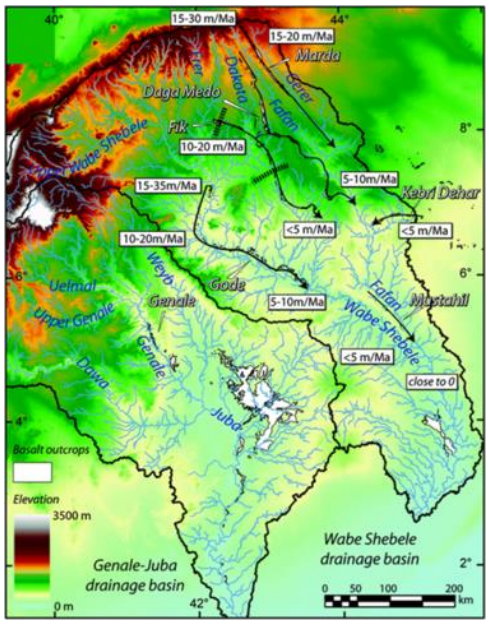
[30] Source: FSNAU, May 2002.

1.2.1 – At the End of the Funnel

The human terrain analysis of the northern Gedo Region suggests us to consider local pastoralism as an example of "ideal behaviour vs real behaviour".[31] This means that camels maintain a symbolic value, but are progressively losing their ecologic viability and economic returns, due to the specific conditions of the area of our Operational Research.

Dromedaries entered Somalia from the Arabian Peninsula during the first millennium BCE, independently and well before than in the Saharan areas.[32] Being more adapted to an increasingly drier climate, in Somalia camels became more than "livestock": they were relational and social capital, rapidly getting special status in line with their owners. The capability of long-distance travel and long-time endurance made Somali camels the epitome of nomadic, free-roaming pastoralism. Now we have to consider the physical and social shredding of the territory in northern Gedo, once known as Daawo:

1. International borders with Ethiopia and Kenya interrupt traditional transhumance routes.
2. The territory is cut in two by the river Jubba, separating eastern pastoralists (Somalia-oriented) from western pastoralists (Kenya-oriented).
3. All drainage systems from the Ethiopian highlands converge to the river Jubba at Dollow, leaving the southwestern plains barren (see Map 1.1).
4. Northeast of the Jubba river at Luuq there is a vast basalt outcrop, significant to pastoralists for vertical transhumance (see Map 1.1), but also a possible haven for Al-Shabaab militia.



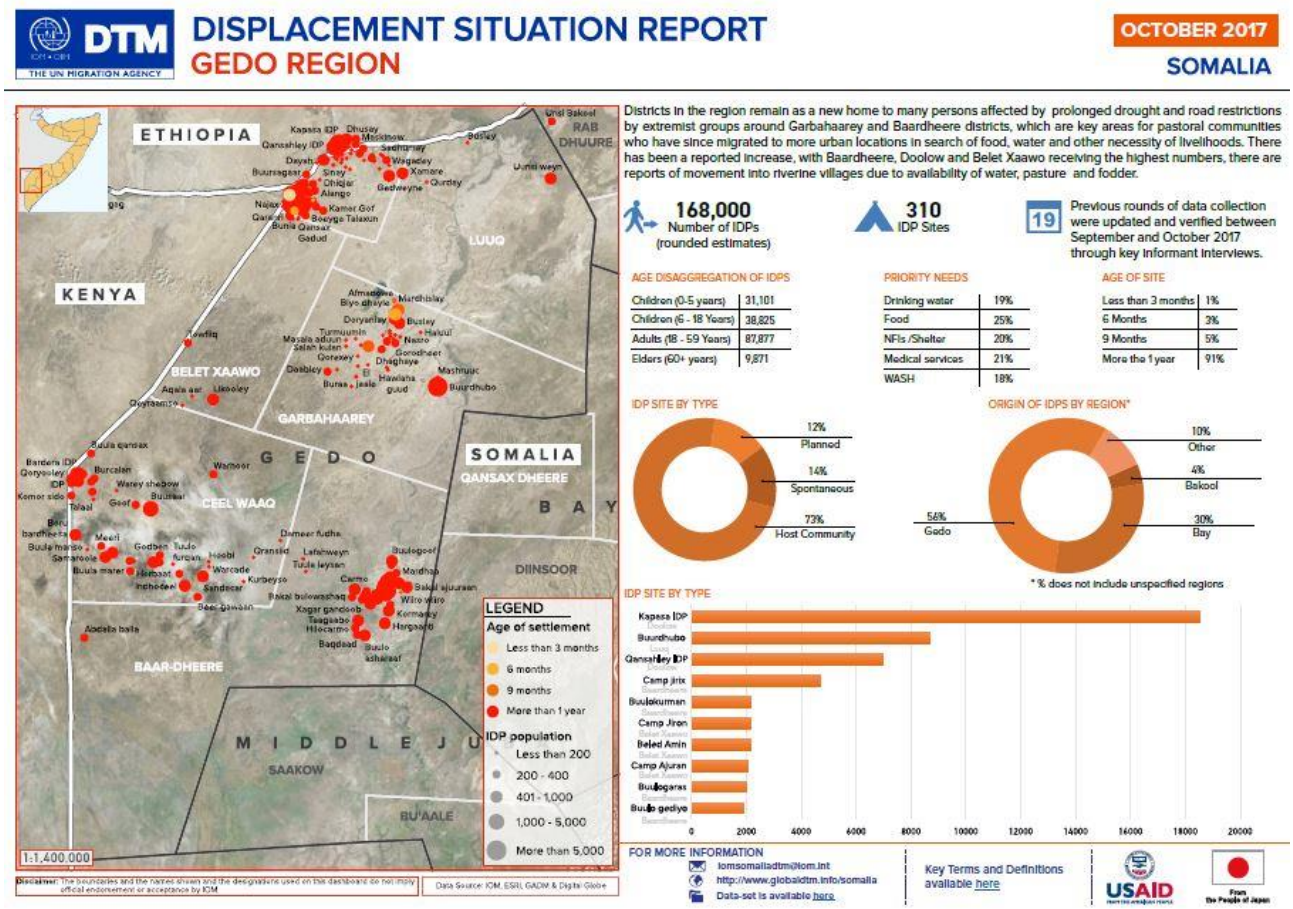
Map 1.1. Gode and Genale hydro-geologic systems, with the Genale-Jubba drainage basin at low centre.[33]

[31] Dyson-Hudson N & R, "The social organization of resource exploitation", in Little MA & Leslie PW (eds.), *Turkana Herders of the Dry Savanna: Ecology and Biobehavioural Response of Nomads to an Uncertain Environment*, Research Monographs on Human Population Biology, Oxford University Press, Oxford 1999; pp. 70-71.

[32] Köhler-Rollefson I, "The introduction of the camel into Africa with special reference to Somalia", in Hjort af Hornäs A (ed.), *The multi-purpose camel: interdisciplinary studies on pastoral production in Somalia*, EPOS, Uppsala University, 1993; pp. 120-21. Phillipson identifies camels among a proto-Somali population in northern Kenya, on the eastern shores of lake Chalbi, at around 3000 BCE; see Phillipson DW, *African Archaeology*, Cambridge University Press, Cambridge 2005; p. 207.

[33] Mège D, Purcell P, Pochat S & Guidat T, *The Landscape and Landforms of the Ogaden, Southeast Ethiopia*, First Online: 24 March 2015. The term m/Ma indicates metres of deposits per megaannum (1 million years).

The pastoralists in Gedo used to cope with these constraints, because they could count on open terrain, minimum border control, seasonal movements, herd diversification and clanic sharing (among others). In recent years, climate change and prolonged internal conflict provided the Somali pastoralists of the region with two negative operational frameworks. Prolonged, dramatic droughts were followed by extreme weather events and massive floods in October-November 2019, as we shall detail in 2.3 when dealing with the environment of the project area. But what changed face to the northern Gedo Region is the "funnel effect" of the IDPs, the forced migration of hundreds of thousands of people (pastoralists and not) towards the critical entry/exit point of Dollow, where Genale and Dawa rivers join at Iskudaraha location, forming the Jubba, running south.



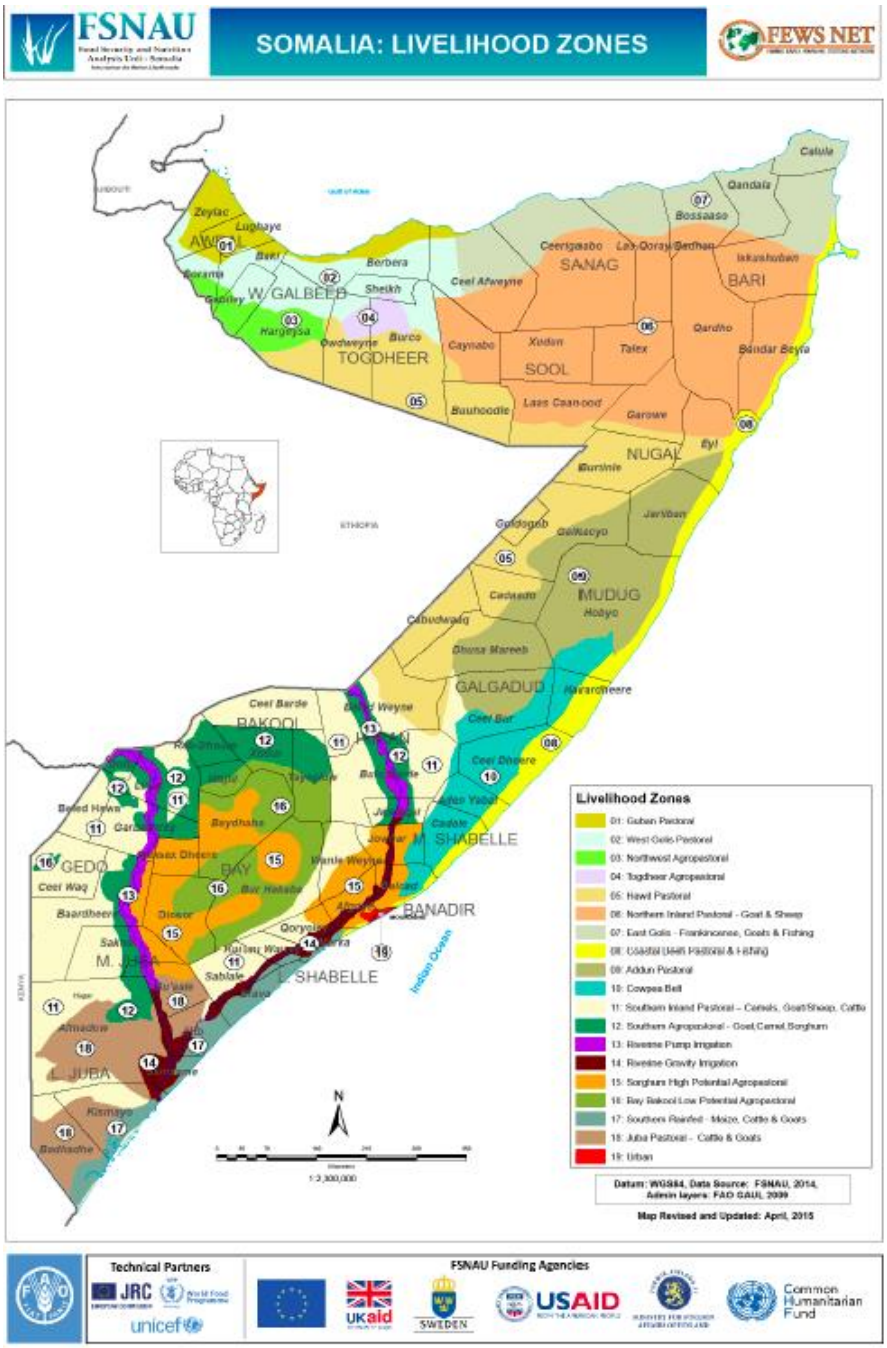
Map 1.2. Displacement situation in the Gedo Region, October 2017 (source IOM-DTM)

We did not investigate the current situation of refugees – being besides the scope of this OR to discuss the IDP issue –, but a visual report of 2017[34] (see Map 1.2) clearly shows a "funnel effect" in the re-population of the Region. While the IDPs of Ceel Wako District concentrate westwards towards the Somali-friend areas of Wajir in Kenya, in northern Gedo the funnelling-push is towards Ethiopia at Dollow (where the Kabasa camp is one of the selected locations of this OR), with camp permanence that exceeds one year.

Like in a funnel, population pressure increases demographic density. A high-density network implies highly standardized values, conditioning individual behaviour to determinism, while low density – typical of pastoral communities – is correlated with strong individualism and probabilistic

[34] In https://www.iom.int/sites/default/files/dtm/IOM-Somalia-DTM-Gedo-Region-20171207.pdf, lastly retrieved on December 14, 2019.

behaviour.[35] This means that the increased density and consequent clan reshuffling in the northern Gedo Region[36] may disrupt the "Somali pastoralist paradigm", leading to a mosaic-based mixed economy and society. In the area, we used to meet southern inland pastoralists (mainly with camels) in open areas, and agro-pastoralists along the river (mainly with cattle and shoats), progressively transformed in pump irrigation agriculturalists (see Map 1.3 – Livelihood Zones 11, 12 and 13).[37]



Map 1.3. Livelihood zones of southern Somalia (source FSNAU)

[35] Full discussion in Maryanski AR & Turner JH, *The Social Cage: Human Nature and the Evolution of Societies*, Stanford University Press, Redwood City 1992.

[36] Gedo Region's population increased substantially in the latter half of the 20th century, reaching more than one million by the early 1990s after the civil war erupted in Mogadishu. Traditionally, the Gedo Region was inhabited almost exclusively by people from the Darood clan, of the sub-clan Marehan.

[37] FSNAU-FEWSNET-Updated-Somalia-Livelihood-Zones-Map-April-2015.pdf; lastly retrieved on December 12, 2019.

Following the evolution of this pattern, we may speak of "opportunistic pastoralists", and this by stretching the limit of pastoralism to its extremes. The ground situation is definitely porous, with livelihoods changing values (from social-capital camels to cash economy), type of community (from nomadic to aggregate to urban), model of economy (meat and fodder for cash sale), scheme of nutrition (from proteins to starches), kinship (from closed clan to exogamous marriage), all this according to circumstances, in a "pendulum aggregation" where social change is liquid, expanding and retreating in all directions.

Since ever, pastoralists count on the cohesive agency of genetics and culture, in what we define "quicksilver model".[38] The pattern is: i) separation of parts when hit by some force and ii) reunion because of "superficial tension", *i.e.* family ties. In the ideal model, different members, according to age and gender, fulfil different niches and perform separate tasks, tied – as per superficial tension in quicksilver – by the concept itself of the Household-cum-Animals Unit.

Nowadays, the cohesive force is broken down or weakened to the point that identities can be negotiated almost every day, but always under the flattening paradigm of modernity. From the *complex* culture of pastoralists, the northern Gedo Region is witnessing the formation of the *complicated* society of mixed pastoralists, former agro-pastoralists, destitute pastoralists (IDPs), subsistence agriculturalists, cash-economy farmers, trade agents, urbanized migrants and so on, most of them with an *ideal* identity way back in pastoralism. Our field research evidenced that almost the totality of answers about pastoral life were sort of normalized by modernity and its variable identities[39]: the person lives inside a pastoralist-non pastoralist continuum, with multiplex identities based on history and performance.[40] Because agency and performance negotiate future community values, out there all people are ready for change, may it come from weather and climate, conflict resolution, development (sustainable or not), education, or whatever wind may blow over their settlements.

Six hundred years ago, Ibn Khaldun[41] described the paradox of nomadic life – its superior character, morality, fortitude, and social cohesiveness – that was being undermined by the inexorable change from nomadic to sedentary life, not the opposite. It was Bedouins who sought the "luxuries" of urban life, not sedentarists who craved for the spiritually uplifting but demanding life of pastoralism.[42]

The Somali experience of restocking while in famine – or inside refugee camps, in an interesting analogy for our OR – to make possible the resumption of pastoral life, is a cautionary tale against reading the nomadic experience of settlement as historically unidirectional. The settled people of the northern Gedo Region, although maintaining ties to the livestock economy, are often not ex-pastoralists but pastoralists-by-other-means.

No longer does the critical triangle of human-livestock-environmental relations unilaterally determine patterns of mobility and husbandry performed in a wide-range pastoral community: herders move not just to access pastures but schools, not just water but shops, or development

[38] Salza A, (ed.), *Don't Ask, Don't Tell. One-Health Seeking Behaviours among Pastoralists in a Semi-arid Land,* Technical report, CCM, Turin 2019; Par. 2.4.

[39] About the standardisation of answers, we must also take into account the stereotyped and repetitive translations by local interpreters and researchers.

[40] Gamble C, *The Palaeolithic Societies of Europe*, Cambridge University Press, Cambridge UK 1999; p. 58.

[41] Arab thinker (1332-1406) who introduced Islam to the notion of critic history, founded on profane factors generated by the natural tendency to weakness of the sedentarized generations, heir of the nomadic life, but prone to progressive decadence due to wealth and the urban way of life.

[42] Cited in Galaty JG, "Time, Terror, and Pastoral Inertia: Sedentarization and Conflict in Northern Kenya", in: Fratkin E & Abella E (eds.), *As Pastoralists Settle. Social, Health, and Economic Consequences of Pastoral Sedentarization in Marsabit District, Kenya*, Kluwer Academic Publishers, New York 2005; p. 53.

projects or clinics and pharmacies. As John Galaty states: 'What is now at stake is not nomadism in a nomadic world, but continuing pastoralism in a world of sedentary sites and institutions'.[43]

1.3 – LET US PRAY FOR HEALTH

'Common cold, the disease we are all suffering from in this rainy season, can be prevented by eating protein food', says Halima.[44] She lives in a semi-pastoral settlement near Beledxaawo, but she still remembers the "time of proteins". Qayrow, a woman in Sullale, near Luuq, says: 'We have farms along the river. During the dry season we move towards the river and plant crops and vegetables like banana, onions, maize, sorghum. That is because there is not enough milk to drink'. A Somali proverb recites: '*Caano daatay dabadooda la qabtaa*', meaning "when milk spills, one tries to catch it by its tail". Both Halima and Qayrow experience the "memory of milk" when, with their fellow herders, they actually "milked health" from animals, because meat and milk meant life and health for everybody, "all bodies".

Biomedicine practitioners take for granted that the body is the receptacle of health. For many people in the world, this may not be held true. For instance, the people speaking Kuuk Thaayorre in the Cape York Peninsula, Australia, have no term for what we think of as "the body". The closest is "true-man" (*pam-minj*), which refers to the specifically physical presence of a human, but also to non-corporeal components of a living person such as her/his voice (*kuuk*), shadow (*man-nganp*), or the footprints (*thamr-rathr*) left behind on the path.[45] Unlike in English and other Western languages, a Thaayorre speaker cannot clearly separate the physical from the non-physical elements of a human being. It is difficult to provide a shadow with a public health service.

The belief that the body is the primary frame of reference is not valid across all communities, as demonstrated by Steven Levinson, at the Max Plank Institute of Psycholinguistics in Nijmegen (The Netherlands):

> The tradition in which the human body is the source of all our notions of orientation and direction is a major ethnocentric error. It is not only that there are languages that do not use the bodily coordinates to construct a relative frame of reference, but there are also many other aspects of such languages, and of the interaction and cognition of their speakers, that point to a fundamental demoting of the body.[46]

To neuroscience, the "body" is a linguistic prejudice introduced by Indo-European migration, and successively elaborated.[47] By the end of the Neolithic, Europeans managed to have, by means of repeated and regular public manifestations (e.g. statues or kinds of treatment of the dead), the appropriate form for the human spirit to take: the body.[48] But this may not hold true for other human groups. Unlike in English and other Western languages, a Thaayorre speaker cannot clearly separate the physical from the non-physical elements of a human being.[49]

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[43] *Ibid.*; p. 54.
[44] Focus Group Discussion in Malkariyey, Beledxaawo District, Gedo Region, on December 4, 2019.
[45] Gaby A , "The Thaayorre 'True Man': Lexicon of the Human Body in an Australian Language", *Language Science*, Vol. 28, issues 2-3, March-May 2006; p. 202.
[46] Levinson S, *Space in Language and Cognition: Explorations in Cognitive Diversity*, Cambridge University Press, Cambridge 2003; p. 14.
[47] *Ibid.*: p. 10.
[48] Bayley DW, "Figurines, Corporeality, and the Origin of Gendered Body", in Bolger D (ed.), *A Companion to Gender Prehistory*, Wiley-Blackwell, Chichester UK; p. 263.
[49] Gaby A, *op. cit.*, p. 207.

This is not the case of Somali speakers, but Africa is to be considered the land of the immaterial, a liminal landscape between the spiritual and the material,[50] where we observe disembodied dimensions of health if we use the pastoralist's point of view. Health-seeking behaviour is a bottom-up performance of individuals, not a mere following of cultural values and social norms. The multiplex identities of the Somali pastoralists in the northern Gedo Region generate what the modern anthropology defines *dividuals*. The word "individual", means "indivisible": like atoms, individuals were considered the core and minimum element of any community, but – just like it happened with the discovery of elementary particles – people appear to be split in different opportunistic selves, much more so under stresses like conflict, forced migration, climate crisis or extreme weather events.

These *dividuals* consider illness as a disorderly moral world, more than a physical accident. We saw above (see 1.1) that Gedo pastoralists change shape climbing up and down their scales of health. The perception of a "healthy" self, becomes then blurred by the difficulty of both *having* and *being* bodies, subject to hazards and risks.[51] To overcome the dichotomy, the Gedo pastoralists seem to have lost the "mnemonics of their bodies"[52] and follow instead the normative health structures implicit in their Islamic religion. If sickness is a cultural performance,[53] they *must* first refer to Allah, and then, maybe, to the health worker. All – and we mean 100%, of the respondents in our field research in the northern Gedo Region – declared that 'We take our sick to the old people; then we call the sheik at home or we take the sick to the mosque; we slaughter an animal and recite *dua* (prayer), while the sheik reads Quran over the sick. If the sick is not cured, only then we refer to the health facility. We have no bush doctors (doctor *baadya*) or herbalist healers'.[54]

The sequence is clearly defined by *all* respondents:[55] illness is recognised at household level (disorder) → the head (male) decides action → a sacrifice is needed (a-life-for-a-life reconstruction of order) → sacred people and places are called in (sheiks and mosques as moral regulators) → biomedicine is eventually approached (health workers and facilities). After the disorder of disease enters the household, the sick person is moved from religious specialists to biomedicine specialists. In any case, a prayer *must* precede the referral. When this sequence is inverted, culture may collapse because '*Caado la gooyey caro Allay leedahay*': "a broken tradition angers Allah". If, like believed by all pastoralists we interviewed, 'disease comes from Allah' (see 1.1) and therefore only Allah can cure it, all public health institutions have to deal with a self-feeding closed circuit.

Among these institutions, the health system for people, livestock, and the environment they live in is the scenario where survival itself is at stake. Even in the context of modern public health, it has been shown that in institutional settings, individual distress is systematically transformed into the amoral, decontextualized signs-and-symptoms of biomedicine, or is alternatively psychologized and moralized with implications for the allocation of responsibility.[56] That is why we

[50] Salza A, "Negotiating with evil. Power artefacts, shamanic relics and brain responses in African healing practices", in: Janot F (ed.), *Silouhettes africaines*, PUN-Éditions Universitaires de Lorraine, Nancy; p. 153.

[51] Lock M, "Cultivating the body: Anthropology and epistemologies of bodily practice and knowledge", *Annual Review of Anthropology*, Vol. 22, October 1993; p. 136.

[52] Comaroff J, *Body of Power, Spirit of Resistance: The Culture and History of a South African People*, University of Chicago Press, Chicago 1985; p. 124.

[53] Frankenberg R, 1986. "Sickness as cultural performance: drama, trajectory, and pilgrimage root metaphors and the making of social disease", *International Journal of Health Services*, Vol. 16, Issue 4, October 1986; pp. 603-26.

[54] This is the authors' synopsis of all interviews and FGD answers about the health-seeking procedures recorded by the Operational Research in November-December 2019.

[55] Very few respondents invert their sequence (biomedicine first), but it is clearly a verbal mistake or an attempt to please the interviewer, a public health worker.

[56] Lock M, *op. cit*., p. 142.

strongly suggest health-project planners to involve and insert sheiks into the public health chain, at least as facilitators and enforcers of accountability, while managing to incorporate modern health norms in the Somali *xeer*, the customary legal system. Religious leaders are a group of non-state actors with which NGOs, as well as donors and the State, often engage in Somalia. As a report from the Overseas Development Institute (ODI) states:

> Worth noting, however, is the fact that NGOs do not necessarily work directly with religious leaders to improve accountability or governance and often omit them from their Theories of change. This is surprising given the political clout religious leaders have in the country.[57]

To the "multiplex pastoralists" of the northern Gedo Region, health is not coming from milk any more. Milk, with its physical and cultural values and parameters, used to provide 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity', as per WHO's standard definition of health.

Nowadays, health cannot be "milked" as a nutrient provided by the optimum performance of pastoralists in their uncertain environment. The women of a neighbouring pastoral group, the Gabra of Northern Kenya, told us last year: 'Our children live with animals, drink their milk, and eat their meat: they are healthy'.[58] In the area of our operational research, instead, health – as perceived and experienced by pastoralists of all kinds – appears to be, literally, left in the hands of God.

Somali say: '*Nin bukaaboqol u talisay*', "a sick man has a hundred advisers". Any research, or One Health approach, or project in the domain of health, should improve the quality and quantity of their advice.

Figure 1.1 – Bantaal health post, Dollow District (courtesy of Abdi Isaak)

[57] McCullough A & Saed M, *Gatekeepers, Elders and Accountability*, report of ODI, London, October 2017; p. 16.
[58] Comberti G and Shamo T, *The voices of pastoralist women in a One Health project*, CCM Technical brief about AICS Project AID11507, Turin 2019; p. 19.

SECTION 2 – BODYSCAPES, LIFESCAPES AND LANDSCAPES

2.1 – PATTERNING

Human reactions to disease are both biological and cultural. Sometimes, these reactions are in contrast, like it happens with pain. Some years ago, we saw a young girl of the Samburu pastoralist group of Northern Kenya climbing two hours down a volcano (cutting lava and rocks) on her broken femur.[59] Two old men were walking next to her, talking all the way about cultural diktats against physical feelings: 'Pain is not to be shown'. She did not utter a lament. But when we loaded her on the Flying-Doctor plane, she burst into tears: she felt abducted from her pain-control cultural network, and left alone in agony. That is the point: a pastoralist, notwithstanding isolation and distance, is never alone. The force-field of the household is always encompassing the individual, even when sick or in pain.

Multivariate reactions to disease organize patterns in mind, behaviour, and body, giving features to what we identify as the "bodyscape". The concept of "scape" – a systemic array of related activities and features[60] – positions the sufferer or the observer *within* the same scenario of the sick, like an enveloping medium that allows to reject objectively-given relations to space, health and body. That way, we, as concerned observers, try to see like a herder.

In the case of pastoralists' livelihoods, this operation creates a domino effect on the health of people-cum-livestock ("lifescape") and the environment they are living in, the landscape.[61] These are the three components of One Health, often negatively perceived as "problems" by most humanitarian interventionists, with the following, misleading development-agency's narrative about pastoralists:

1. Pastoral environments are seen as a static nothingness, with scarce resources (landscape);
2. Pastoral mobility and livelihood are perceived as a liability (lifescape);
3. Pastoral individuals are constantly considered at physical and psychological risks, because of conflict, diseases, food insecurity (bodyscape).

Like this development narrative, health patterning is not self-evident, once set into a culture. Closely related to the kinds of individual decisions and behavioural patterns, culture influences human health and the patterning of disease.

Gender is obviously one of these patterns. Our field research in Gedo confirmed that, among the Somali pastoralists, the 'family father' takes all decisions about the referral and treatment costs of the household members: so they declare this power-position like a fixed pattern. Somali are quite fond of proverbs to delineate and enforce moral codes of conduct (that is why we often cite them): one is '*Haween la'aani waa hoy la'aan*', "Where there are no women, there is no home"; indeed, this banality may be followed by a quite crude oppositional sentence: '*Naag ha kaga jirto guri ama god*', meaning "Your woman should be in the house or in the grave". This

[59] Salza A (ed.), *Don't Ask, Don't Tell. One-Health Seeking Behaviours among Pastoralists in a Semi-arid Land,* Technical report, CCM, Turin 2019; Par. 1.1.

[60] Ingold T, "The temporality of landscape", *World Archaeology*, Vol. 25, No 2, October 1993; p. 158.

[61] These and the following "scape" concepts have been elaborated and used throughout in: Semplici G, *Moving Deserts. Stories of mobilities and resilience from Turkana County, a Kenyan desertscape*, thesis submitted for the Degree of Doctor of Philosophy, Department of International Development, Oxford 2019, to which Salza participated as an external tutor; see also: Appadurai A, "Global Ethnoscapes: Notes and Queries for a Transnational Anthropology", in Fox RG (ed.), *Interventions: Anthropology of the Present*, School of American Research, Santa Fe 1991; pp. 191-210.

ambivalence can be explained by a myth of the origins, vastly diffused among Cushitic-speaking people, according to which women once had political power, but they lost it to men.[62] The reversed power struggle is economy *vs.* biology.

It looks like there is no way out of male dominance for Somali women, even in the domain of their health. Our field researches have shown elsewhere[63] that this is a stereotype, and it should be redressed. In African pastoral societies, there is a division of labour as well as a division of power. Men deal with the present (household daily survival), while women deal with the future (generation and maintenance of children). Therefore, the health-seeking behaviours of men and women follow different power domains and action patterns, as confirmed by a CCM health operator in Northern Kenya: 'Most of the elders are not willing to participate in human health out-reach services, taking it as "women's issue"'.[64]

Tradition can be a killer, when local conditions vary. Livestock is diminishing because of ecological and economic reasons, and men are losing power. The health of animals and the environment they live in is daily becoming a mirage. Like it happens after wars, more than half of Somali households are female-headed, but approximately half of female-headed households are living below the poverty line.[65] The gender pattern is obviously active among the Somali pastoralists' narrative, but it is made flexible by the stresses of modernity and emergency in the northern Gedo Region. Gender roles and responsibilities saw a shift at household level. Before the crisis (war and displacement), men were breadwinners in their families and women did not work for cash. Now women, especially in IDP camps, perform manual labour such as washing clothes for other people. According to a report by the NGO Trócaire, active in the same area of our field research:

> One of the major barriers to women accessing health is service providers being of opposite sex. When asked about their preferences when it comes to the sex of the healthcare provider, most respondents expressed that they prefer a same sex service provider. However, women in Kabasa [one of the localities of CCM's research] observed they prefer male health service providers because they are more respectful and welcoming, while female staff are disrespectful.[66]

Apart from suggesting, like Trócaire, that gender balance in health staffing should be a priority in Somali public health planning (like everywhere else), we see that the gender pattern about health and economics is already rapidly changing in the northern Gedo Region.

While planning health interventions, we must consider that the way of life, combined with learned behaviour, the strategies for adjusting to the environment, and the modalities of feeling, all influence our susceptibility to illness. Bodies and pathogens are determined not just by physical actions, but by beliefs, and beliefs are powerful motivators. According to James A. Trostle, of the Trinity College at Hartford:

> Rates of morbidity and mortality are determined in part by cultural scripts that specify how, where, and when to behave in certain ways. The influence of culture can be seen in how people care for symptoms before they receive a diagnosis. Groups vary in their willingness to undertake preventive measures; they

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[62] An example is in: Wood JC, *When Men are Women: Manhood Among the Gabra Nomads of East Africa*, University of Wisconsin Press, Madison 1999; p. 5.

[63] Comberti G and Shamo T, *op. cit*., 2019.

[64] Monthly Report to AID 11507 project "ONE HEALTH: Multidisciplinary approach to promote the health and resilience of shepherds' communities in North Kenya", CCM, North Horr, July 2019.

[65] INFORM Global Risk Index 2019 Midyear, available at https://drmkc.jrc.ec.europa.eu/inform-index/Results-anddata/INFORM-2019-Results-and-data.

[66] Trócaire, *Gender Analysis Report Gedo Region, Somalia*, September 2019; p. 9.

vary in how they perceive and classify symptoms. Across the world, people employ diverse markers to decide who will be labelled disease-ridden or contagious; they differentially rank which diseases are seen as important or unimportant. What treatment, if any, sick people choose, whether they take medication, how they manipulate their diseases for other ends, whether therapy succeeds – culture influences diseases through these pathways as well as through the patterned work of nerves, muscles, and bones.[67]

We can say that, today, biomedicine is a particularly widespread and effective form of therapy, but it is a cultural-system patterning like the others, often competing with them, less frequently collaborating.

That is the reason why it is important to highlight connections between patterns of disease and patterns of culture. An anthropological approach was needed to identify these processes, and a field operational research helped develop more appropriate health policies, deepen understandings of disease causation and treatment, and create more effective actions to enhance health and prevent disease among people who – as we have already glimpsed among the pastoralists in the northern Gedo Region – consider health and disease at quite different scales and values than biomedicine.

Figure 2.1. IDP mother at Kabasa camp dispensary (courtesy of Abdi Issack)

2.2 – BLURRED LIVELIHOODS

Pastoralism is the dominant livelihood for a large number of Somali people: it is their lifescape. It shows a different degree of mobility, from nomadic to sedentary. In 2011, the pastoral population in Somalia was estimated at 2.3 million (29% of the total), of which 52% resided in the

[67] Trostle JA, *Epidemiology and Culture*, Cambridge University Press 2005, Cambridge 2005; p. 2-3.

north, 33% in the south and 15% in central Somalia.[68] Note that population numbers in Somalia are either based on estimates from surveys or extrapolations from the 1997 population census.

Livestock production has been the backbone of the Somali economy for centuries. It is also the most important source of cash income for the predominantly rural population, and meat, together with milk, assures 55% of the calorific intake of the entire population. A projection of 15 years ago estimated livestock numbers to include around 5.2 million cattle, 13.5 million sheep, 12.5 million goats and 6.2 million camels, with cattle being concentrated mainly in the south and camels in the northern part of the country.[69] The predominance of the nomadic rearing system – with herds moving even across borders into Kenya and Ethiopia in search of forage and water (and illegal market, nowadays) – and the almost complete absence of fixed assets, has meant that livestock production was not as heavily impacted by the civil war as other production systems. Compared with other nomadic livestock systems, that of Somalia is quite market-oriented. Approximately 2.5 million animals were exported each year, representing in 2003 about 40% of gross domestic product (GDP) and 80% of foreign currency earnings, according to World Bank's data.[70] Perturbed by the export bans placed on Somalia by countries like Saudi Arabia, the export of live and slaughtered animals was then hampered by the collapse of the public veterinary system, and the absence of an animal health surveillance system in particular.

As we discussed above, after some 15 years the present situation in the northern Gedo Region is blurred by multiplex livelihoods, assumed by pastoralists, agriculturalists and forced migrants. Although southern Somalia's environment suffered less from the livestock pressure of nomadic pastoralists than the northern parts of the country, agricultural development and the expansion of the cattle industry are now placing severe pressure on the area, economically and ecologically speaking. That is why diversified livelihoods are becoming less and less significant in the northern Gedo Region, where flexibility and opportunism appear to be the role against the "normal" tripartite livelihood categorisation.

1. The pastoral system: in Somalia used to cover approximately 72% of the total area, extending across the country with major concentrations in central and northern regions. One is considered a pastoralist if more than 50% of the income comes from livestock.
2. The agro-pastoral system covers 23% of Somalia, while the agro-pastoral population represents 26% of the total population, with 88% of this concentrated in the south, where the Gedo Region is. Various rain-fed crops guarantee subsistence and trade. In Gedo, the pump-irrigation prevails, including fodder for sale. Livestock are used for family consumption, income, transportation, land preparation, and as a crop-failure mitigation measure.
3. Urbanisation is increasing rapidly. Internal labour migration is fuelled by weakened pastoral livelihoods – in large part due to the 2000-2009 livestock ban prompted by a Rift Valley Fever outbreak in Saudi Arabia (the first ever outside Africa). Migration because of drought and IDPs escaping conflict add to the intensity of clashes with the resident population. Many pastoralists dropped out of pastoral production and migrated to urban centres where better livelihoods are perceived as possible.

Gedo Region's population increased substantially in the latter half of the 20th century, reaching more than one million by the early 1990s after the civil war erupted in Mogadishu. Traditionally, the Gedo Region was inhabited mainly by people from the Darood clan, of the sub-clan Marehan. Nowadays, this social situation changed with inputs from internal migrants. In the available literature by aid and development agencies, there is a differential perception of the local economy

[68] FAO-Somalia, *Plan of Action 2011-2012*, FAO 2011; p. 5.
[69] UNEP, *The State of the Environment in Somalia*, *A desk study*, Nairobi, December 2005; p. 28.
[70] World Bank, *Country Re-engagement Note*, UNDP/World Bank, Somalia, Nairobi April 2003; p. 8.

protagonists in the Gedo Region. For instance, in a recent development proposal,[71] the Districts of Beledxaawo (about 65,000 people) and Luuq (about 51,000) are said to have a significant 60% of urban population with "industries" and informal sector activities, while the most important subsistence strategies in the rest of the two districts is said to be agricultural, directly connected to the water systems of Dawa and Jubba rivers. In any case, the two systems provide (according to the above-mentioned project) some food security only to 27% of the families, while only one third of the population appears to be self-sufficient from pump-irrigation agriculture.

The liaison between the two tendencies (pastoral livelihood ↔ agricultural livelihood) is at the moment held – along rivers and with energy/cash inputs for pump fuel – by subsistence crops and the cultivation of fodder for household's livestock consumption or for sale. As per a recent report by VSF-Suisse active in the Gedo Region:[72]

> Maize fodder, cowpeas, Sudan grass, beans and sorghum were harvested in a cropping season per household in the range of 70-900 bundles [a fresh bundle of fodder weighs between 2 to 5 kg]. Odaa and Malkariyey [65% of households with access to irrigation farming] villages reported a crop of 1600 bales[73] (*Columbus grass*) and 600 bales (*Sudan grass*) respectively […] The livestock feed security period ranged from 2 to 8 months, with most sites reporting 6 months. The food self-sufficiency period from the benefits of fodder activities was in the range of 1 to 10 months; with the majority reporting 2 months. The main challenges of fodder were: floods, lack of farming implements/storage facilities/skills […] The findings revealed that most of the fodder farmers owned livestock in the following range: camels (0-2); cattle (1 -2); donkeys (0-4); sheep (1- 3) and goats (10-25).

The above reported situation was just before the heavy *deyr* rains of October 2019, which devastated the region with an unseen rain increase and vast floods (see further, 2.3). Before that, the lifescape of pastoralists in the region was shrinking, with progressive loss of livestock due to drought. In a previous report from the same source,[74] at Beledxaawo, while small ruminants were owned by some households, most of the respondents owned none or only a few of the other livestock species within the 2014-15 years. For instance, 95% of people had no camels, while 80% reported to be without cattle. Sheep and goat herd-sizes had reduced too. During the same period, in Luuq most respondents owned all livestock species, with sheep and goats being the majority, with positive and negative variation in herd size (68% had no camels). Sheep, goats and donkeys increased. The donkey is significant for water transport and farm work, not much in pastoral livelihoods, where the now exiting camel was the core of survival and status. According to the authors of that report, 'the exits could be attributed to cyclic droughts, diseases and sales to meet other family obligations'.

The local economy is complicated by the presence of refugee camps and internal migrants, that tend to settle in towns or near the rivers, where roads and services are available. What is utterly missing from this picture, is the pastoral economy, traditionally able to support most households in the northern Gedo Region. The fact is that pastoralists, highly mobile even when needing medical/food assistance, are almost invisible to both economists and medical personnel (check the

[71] "Intervento di emergenza in favore delle popolazioni locali sfollate colpite dalla siccità in Somalia", AID11248 by Terre Solidali Onlus, Nairobi 2018.

[72] VSF-Suisse, *LLRP-III Baseline Survey Report, Gedo Region of Southern Somalia. Focusing on Livestock, Veterinary Pharmaceuticals and other Medical Commodities (VPMC), Irrigation, Water supply and Hygiene Promotion Sub-Sectors*, Lifesaving & Livelihoods Restoration Project, Nairobi February 2019; pp. 11-14.

[73] A traditional "bale" of hay weighs about 2 kg. Bales of hay made by VSF-Suisse supported farmers weigh approx. 1518 kg each.

[74] VSF-Suisse, , *LLRP-III Baseline Survey Report, Gedo Region of Southern Somalia. Focusing on Veterinary medicines or vaccines, Livestock, Irrigation and Water supply infrastructure Sub-Sectors*, Lifesaving & Livelihoods Restoration Project, Nairobi November 2005; pp. 12-13.

urban health-centre referrals, the only available to statistics, where the sick person's "profession" is not registered); we ascertained this situation in Ogaden (Somali Region of Ethiopia 2004-2006), in Filtu (Ethiopian border near Dollow, 2014-2016) and North Horr (Northern Kenya, 2018).[75]

The operational research in Gedo has the task to redress this perception and derived cultural biases: the illusive concept that agriculture is the way to get a decent livelihood from scarce resources is affecting socio-medical intervention plans and aid strategies in general, above all in the domain of pastoralists' livelihood and health.

Economy and lifescape are not immune from cultural biases. According to information derived by an extended research in the Gedo Region, the Hubeer sub-clan (a cluster of 30 family groups) shows a binary social composition, the "nobles" (*bilis*) and the intrinsically low-status adopted members (*boon*). This leads to considerations about a rich person (a *bilis* by definition) being poor, and a poor person (*boon* by standard), being rich. By this social partition, a person may also be a sick rich or a rich sick, with considerable twists in the demography/health data, not to speak about self-esteem and identity.[76]

Figure 2.2. Negotiating identity and River Jubba at Bantaal (courtesy of Abdi Isaak, at right)

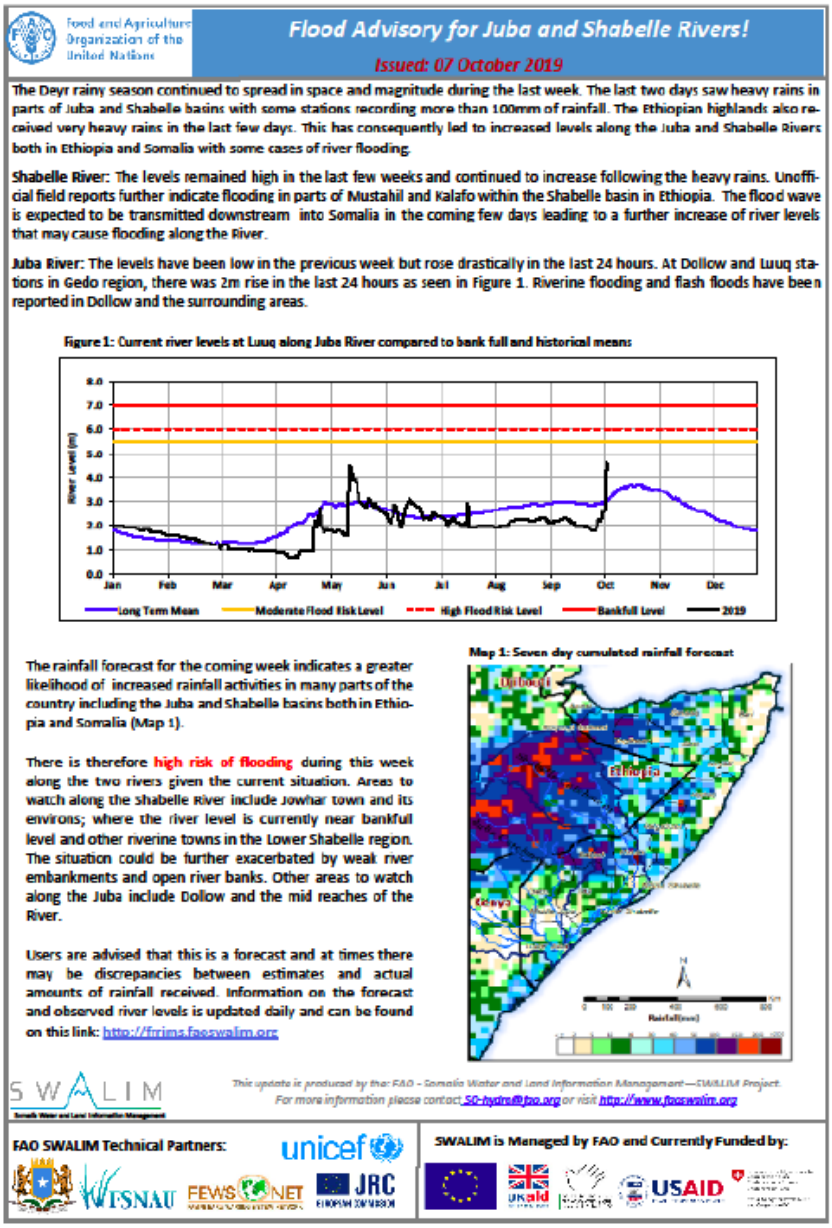
2.3 – LANDSCAPE AT CHANGE

Pastoralists, livestock and the environment they live in is an eco-social unit: indeed, they *are* their animals *and* ecosystems. A mutual environment surrounds pastoralists, moves with them (a herder has five cardinal points, North, South, East, West, and the mobile Centre, *Ego*), feeds them and their animals.[77] But like any living entity, this SES mutates with time. What characterizes the northern Gedo Region is *change* in all "scapes": change in clan composition, increase in population density (quite variable with the continuous in- and outflows of IDPs), constraints against nomadism (security), diminution in herd size, shift from camels to sheep and goats

[75] See CCM's reports by Salza A (2016, 2018, 2019), *op. cit*.
[76] Helander B, "Power & Poverty in Southern Somalia", in Anderson DM and Broch-Due V, *The Poor Are Not Us*, Eastern African Studies, James Currey, Oxford 1999; pp. 91-105.
[77] Gamble C, *op. cit.*, p. 138.

(complementary feeders), change in urbanisation patterns (in and out camps and refugia). Behind and before all this, there must be change in the landscape.

Change, and not the "norm", is therefore the informative benchmark along which the regional circumstances should be considered. During the period of the OR we are dealing about, a very significant change happened in the rain regime of the last *deyr* season (October-November 2019). The main consequences to this extreme event were extended floods, blocking access to resources both for pastoralists, agro-pastoralists and farmers, not to mention the highly reduced mobility on all roads. Due to the rains from the Highlands of Ethiopia, even upriver localities along the river Jubba, like Dollow, on October 7, 2019, were considered by SWALIM at 'high risks of flooding' (see below, Chart 2.1, centre, for river levels (black line), compared to historical means (blue line).[78]



Food and Agriculture Organization of the United Nations

Flood Advisory for Juba and Shabelle Rivers!

Issued: 07 October 2019

The Deyr rainy season continued to spread in space and magnitude during the last week. The last two days saw heavy rains in parts of Juba and Shabelle basins with some stations recording more than 100mm of rainfall. The Ethiopian highlands also received very heavy rains in the last few days. This has consequently led to increased levels along the Juba and Shabelle Rivers both in Ethiopia and Somalia with some cases of river flooding.

Shabelle River: The levels remained high in the last few weeks and continued to increase following the heavy rains. Unofficial field reports further indicate flooding in parts of Mustahil and Kalafo within the Shabelle basin in Ethiopia. The flood wave is expected to be transmitted downstream into Somalia in the coming few days leading to a further increase of river levels that may cause flooding along the River.

Juba River: The levels have been low in the previous week but rose drastically in the last 24 hours. At Dollow and Luuq stations in Gedo region, there was 2m rise in the last 24 hours as seen in Figure 1. Riverine flooding and flash floods have been reported in Dollow and the surrounding areas.

Figure 1: Current river levels at Luuq along Juba River compared to bank full and historical means

The rainfall forecast for the coming week indicates a greater likelihood of increased rainfall activities in many parts of the country including the Juba and Shabelle basins both in Ethiopia and Somalia (Map 1).

There is therefore **high risk of flooding** during this week along the two rivers given the current situation. Areas to watch along the Shabelle River include Jowhar town and its environs; where the river level is currently near bankful level and other riverine towns in the Lower Shabelle region. The situation could be further exacerbated by weak river embankments and open river banks. Other areas to watch along the Juba include Dollow and the mid reaches of the River.

Users are advised that this is a forecast and at times there may be discrepancies between estimates and actual amounts of rainfall received. Information on the forecast and observed river levels is updated daily and can be found on this link: http://frrims.faoswalim.org

Map 1: Seven day cumulated rainfall forecast

SWALIM

This update is produced by the: FAO - Somalia Water and Land Information Management—SWALIM Project.
For more information please contact SO-hydro@fao.org or visit http://www.faoswalim.org

FAO SWALIM Technical Partners: unicef, USAID, FEWS NET, JRC

SWALIM is Managed by FAO and Currently Funded by: USAID

Chart 2.1. Flood advisory and River Jubba levels during deyr rains*, October 2019 (Source: FAO SWALIM)*

[78] https://reliefweb.int/sites/reliefweb.int/files/resources/Flood_Advisory_Juba_and_Shabelle_07102019.pdf, lastly retrieved on December 26, 2019.

The flood peaks (black line) against “normal” means (blue line) are obviously to be related to extreme rain events. In Chart 2.2 (see below), the deviation from long term mean (LTM) in the rainfall performance in Somalia is dramatic. From January 2001, there was never such a high increase in monthly precipitation, when compared to October 2019. We remind that these are not absolute values, but indicators of *change* in monthly pluviometry.

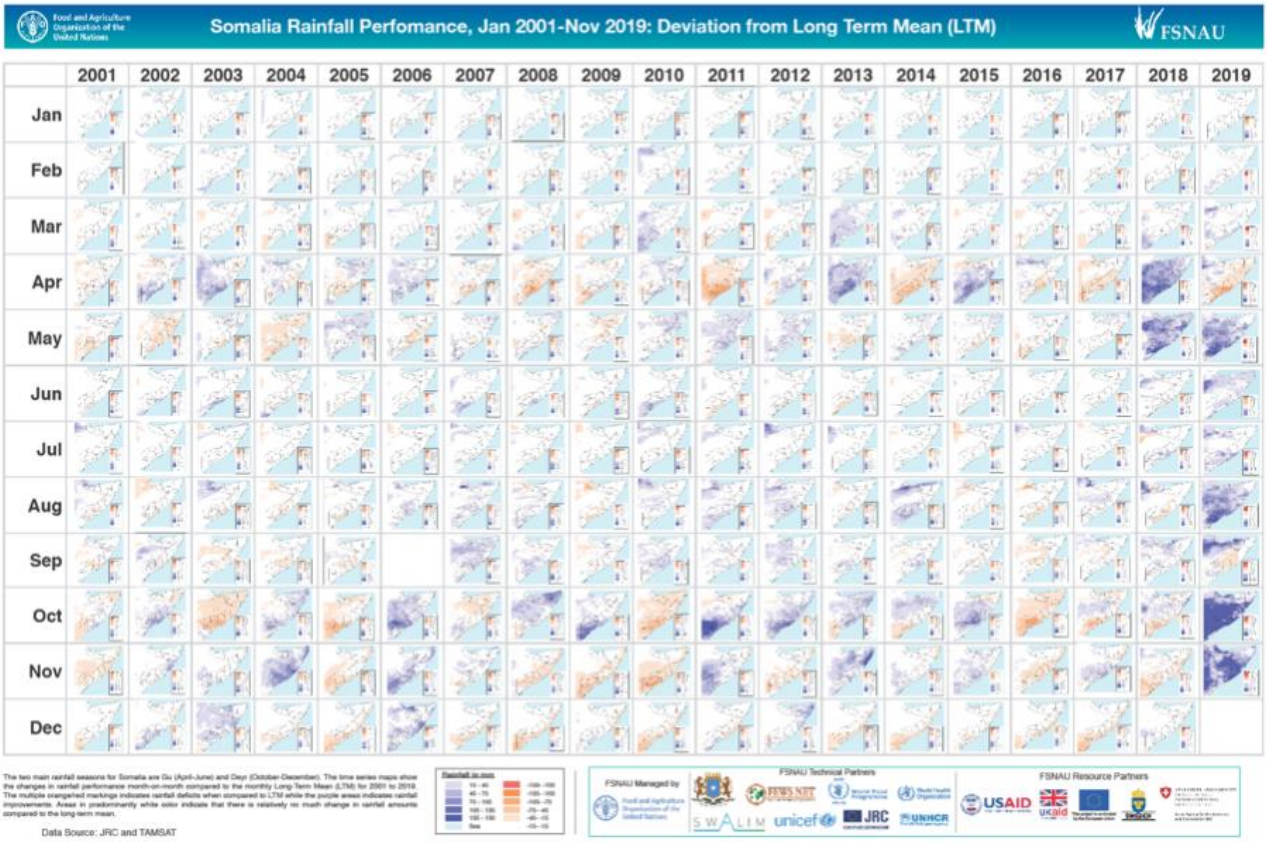


Chart 2.2. Somalia Rainfall Performance: deviations from the LTM, 2001-2019 (Source: FSNAU)[79]

The limiting factor for a herder is grass, not water, because the adapted Somali livestock – in a semi-arid wood/bush savannah like the one of the Gedo Region – can get enough moisture from morning dew and fresh vegetation, even for prolonged periods.[80] Grass is a derivative of rainfall, though: Saharan Touareg nomads call themselves “the sons of the clouds”. In Ogaden and in Filtu area (Somali region of Ethiopia), we identified among the pastoralists young “cloud scouts”, who observed the formation of humidity in the sky after a dry season to predict rain, and immediately go to check the grass growth in their traditional grazing locales.

Therefore, after an extreme event like the rains of October-November 2019 throughout the Horn of Africa, we might expect a parallel variation in vegetation growth. This is exactly the case, as demonstrated in Chart 2.3 (next page). Since 2002, the vegetation increase was never so deviating from the Long-Term Average (LTA), even more than the exceptional year of 2006. This is clearly visible in the dense green (high deviation) at the end of 2019 column. But the question is: the condition of which species of trees and grasses is deviating from average?

[79] At https://reliefweb.int/sites/reliefweb.int/files/resources/Rainfall-for-Somalia-Over-The-Years-2001-2019.pdf, lastly retrieved on December 24, 2019.

[80] Salza A, *Atlante delle popolazioni*, UTET, Torino 1997; p. 209-11.

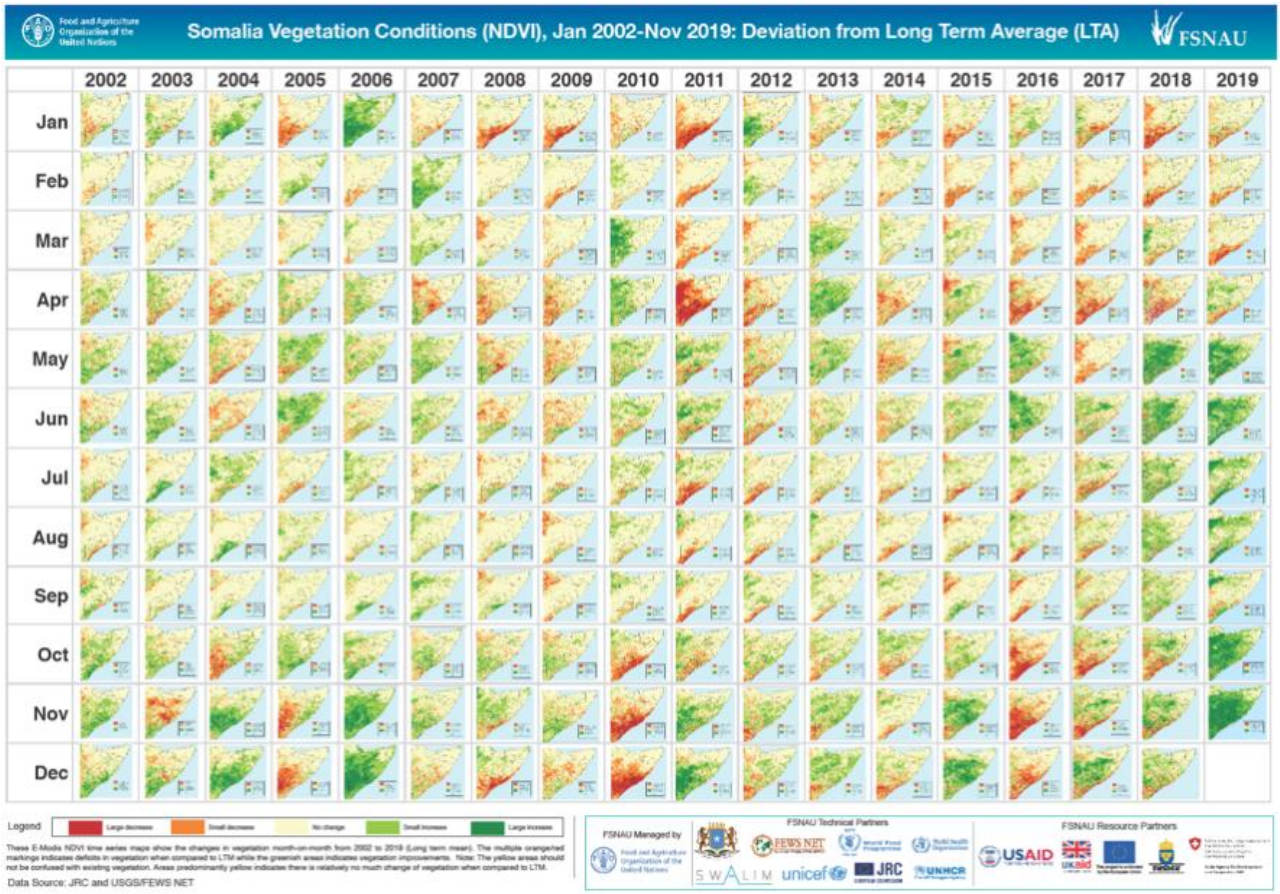


Chart 2.3. Somalia Vegetation Condition. Deviation from LTA 2002-2019 (Source: FSNAU)[81]

The above question about the relationship rain/grass is crucial for the herder. In the field, among pastoralists living in the northern Gedo Region, we gathered complaints about encroaching plants and the diffusion of ventral bloating killing livestock. Both phenomena are bound to climate change.

Charts 2.2 and 2.3 give no information about this basic question for pastoralists: after all these rains and floods, shall we have more grass or more bushes? Again: would tree leaves keep their nutritional power? Where should I go to get better pasture? What has a change in the pattern of rains to do with the health of my family and livestock? As we said above, Somali pastoralists tend to "health serenity", a guaranteed minimum of health, both for humans and livestock, habilitating them to freely exploit the environmental resources by continuous movement. They do not tend to an abstract individual health optimum, the one considered by modern biomedicine. But they are well aware that something is going astray in their environment. Let us hear four pastoralists from Malkariyey, Beledxaawo District:[82]

> Mohamed: '[after these rains] the most common disease in our animals, especially cattle, is the abdominal distention gas, flatulence: the animal cannot and dies within few days'.
> Isack: 'The traditional way of managing abdominal distention is to burn the stomach'.
> Husen: 'The animal should be lied on his back, so gas comes out'.
> Jamaal: 'You insert your hand in the animal anus and relieve it'.

[81] At http://www.fsnau.org/downloads/NDVI-Index-for-Somalia-Jan%202002-Nov%202019.pdf; lastly retrieved on December 25, 2019.
[82] FGD at Malkariyey, Beledxaawa District, on December 4, 2019.

The divergence on a solution about bloating tells about the relative novelty of the disease (or ignorance due to a long-time divergence from pastoralism), that can be fatal to livestock.

In a neighbouring area (North Horr, Marsabit County, Kenya), our field research found in 2018 fancy remedies to bloating. Some women said: 'We have no knowledge about the causes of bloating in our shoats. We use Omo powder to induce burping and gas exit: it works! If we do not have Omo, we use the milk from the sick animal instead'.[83] In another camp, the family head, Wario, introduced the topic of bloating: 'It is caused by eating wet grass'.[84] That is correct: bloating is a typical example of a One Health problem: excessive or out-of-season rains induce growing of grass at the wrong moment (environmental health). Therefore, animals gorge themselves with a wet indigestible vegetal mass, produce ventral gas (animal health), and eventually die (loss of nutrition for humans). 'Then we use Omo'. This "eco-disease" should be treated by preventing the animals from eating wet grass and, if the case, their belly should be pierced by a small pipe to let the air blow out. 'Can you teach me the needle procedure?' asked us Wario, but added: 'What about infection risks?'

Instead, the topic of plant encroachment has been quite crucial in the past 30 years, and it may directly be related to climate change. According to scientists, Holocene grasses are vulnerable to atmospheric warming, leaving room to a succession of bushy plants, an effect quite visible in the Gedo Region vegetation.[85] Reduced open grassland is an increasing problem throughout the Horn of Africa. Pastoralists remember when grass was knee-tall, while nowadays thorny bush is taking over. We had no time to thoroughly investigate the subject in the Operational Research area, but we can utilise the perception of pastoralists from another neighbouring area (Filtu, Somali Region of Ethiopia) to give the scope of the problem. *Maalin* Abdlullahi Ahmed said:[86]

> Twenty years ago, here was the best place for grazing, one grass growth following the other after good, strong rains. But then grass started dying off, substituted by the ubiquitous thorny bush (*hanan*, or "killing bush"). Our place was called *Anabadan* meaning "a lot of milk", from camels and cows at the same time. We could have 20 litres per day, for milk and ghee. One place in the neighbourhood was called Becid because it could support many big antelopes (*becid*). A place was considered *banan krenji* ["flatland with green colour"], and now it is grey bush.

According to the relevant literature, increase in woody cover of thorny bush (*Acacia* sp.) leads to declines in the productivity of understory grass or herb layer species.

The two flood peaks of Chart 2.1, similar in intensity both for the *Gu* (long) and *Deyr* (short) rain seasons evidence another recent phenomenon that might hit the Greater Horn of Africa. After a climatic research in Kenya, it was shown that in North Horr the two rainy seasons tend to equal values (see below, Chart 2.4). The decreasing differential in rain precipitation (dotted blue and yellow lines, converging at right) is a warning about a deep change in local climatic conditions, possibly affecting the growth of seasonal grasses and shrubs.

Throughout our missions, pastoralists rumoured about a lack of nutritional power in some fodder plants, and the depletion of grazing land. Husen, a pastoralist from Malkariyey: 'Wild fruits are diminishing and it is not like in previous years: people used to depend on wild fruit as a source of vitamins and food, but now you will not find those trees any more'. Mohamed, from the same location: 'The change of weather is due to deforestation and flood. Floods are removing the soil

[83] Eel Beso settlement, November 4, 2018.
[84] Barambate settlement, October 10, 2018.
[85] Roberts N, *The Holocene: An Environmental History*, Blackwell, Oxford 1988; p. 68.
[86] See Salza A (2018 and 2019), *op. cit.* wherefrom scientific information about encroaching vegetation is derived.

top-layer; only rocks are visible. Previously it was fertile land with a lot of grass, but now it is different'. More by Muslima: 'Previously, when I was young, I used to look after animals. There were plenty of wild fruits and thick forests, but now the land has become barren land. Nowadays you will not get even some shade to rest under it'.[87] Nuria, from Bantaal: 'Important plants are disappearing, like the plants that used to give us wild fruits when we became hungry'. Halima, agro-pastoralist from the same village along the river Jubba: 'Soil lost its nutritional power because of an abnormal growth of cereals and other crops'.[88] Nimco, pastoralist from Sullale (Luuq): 'Plants have relatively lost their fruits. Some years back our lunch depended on them'.[89]

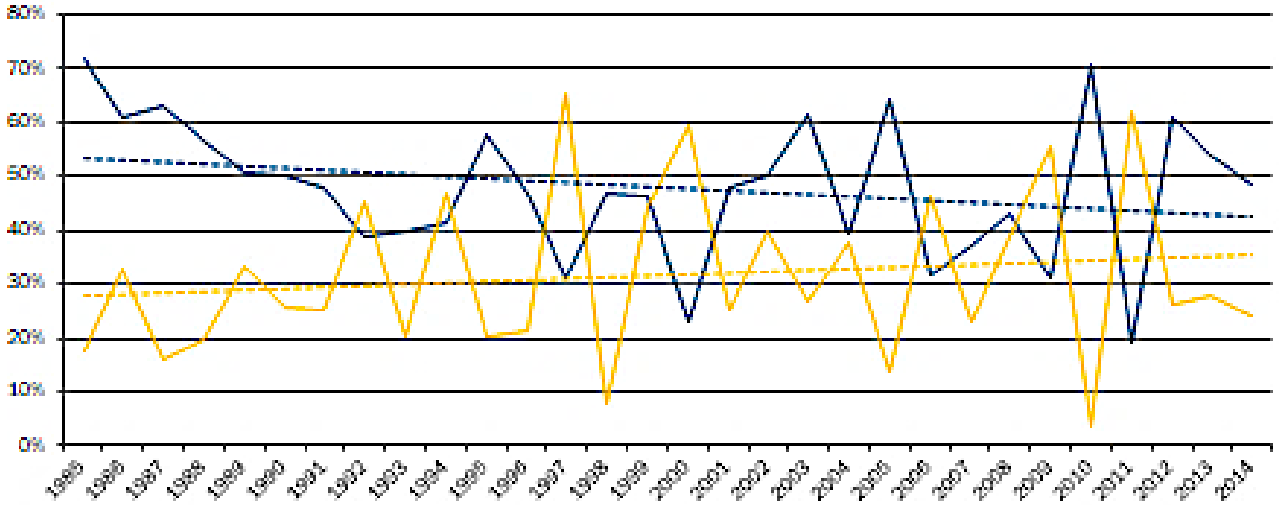


Chart 2.4. Difference of seasonal precipitations during the year, North Horr 1985-2014 (by DIST)[90]

An environment-related issue is the infestation of algarroba (*Prosopis juliflora*), a problem shared by other pastoral communities in the Horn (Figure 2.1). The plant, looking like an acacia, has its origins in Brazil, and was imported for reforestation projects. Now it is infesting: it encroaches the land, impeding the passage of animals and people, and preventing livestock to feed on the grass under it. Its pods and leaves are eaten by livestock, but they do not give nourishment like other plants. Its thorns are infective, so much that a camel can die by foot necrosis if pricked. Hereafter we refer the words of a family of Somali pastoralist. Isniina: 'There are plants called *cali garoob*. They are thorny trees, and easily grow anywhere'. Mohamed. 'There is abnormal diffusion of a fast-growing tree, expanding in the bush. Animals do not eat it and there is no benefit for human consumption'. Abdi: 'This plant has a negative impact: no grass or any other plant can grow under it. The only solution is to eradicate this tree'.[91]

Total eradication of *Prosopis* might not be the only answer, considering the economic value of firewood and charcoal in the northern Gedo Region, but the local pastoralists' perception is against changes in the fodder plant availability and not in favour of money returns: to buy what, grass? For the semi-sedentarized and settled populations, instead (not to count the IDPs) fodder agriculture and charcoal production mean cash, an asset nowadays progressively substituting any other form of economic exchange medium in the area.

[87] Malkariyey spotters' report, December 11, 2019.
[88] Bantaal spotters' report, December 15, 2019.
[89] Sullale spotters' report, December 14, 2019.
[90] Bigi V (DIST) and Vigna I (COO), "La ricerca sul campo: analisi del contesto geografico-climatico", power-point for the CCM conference *One Health, relazione tra salute umana, animale e ambientale*", Turin November 13, 2018.
[91] Tuulo Amin, Household Spotting Unit's interview, December 5, 2019.

Figure 2.1. Prosopis *bush encroachment on the road to Malkariyey (courtesy of Abdi Isaak)*

The life of a herder – like that of any "responsible person"[92] – is bound to qualitative choices, not to quantitative maps. From her/his large-scale ecology perspective, resources are not scarce (as per the usual development agencies' narrative that sees movement as a "survival condition"[93]), but unevenly distributed in space, time, and connectivity.[94] As Greta Semplici puts it:

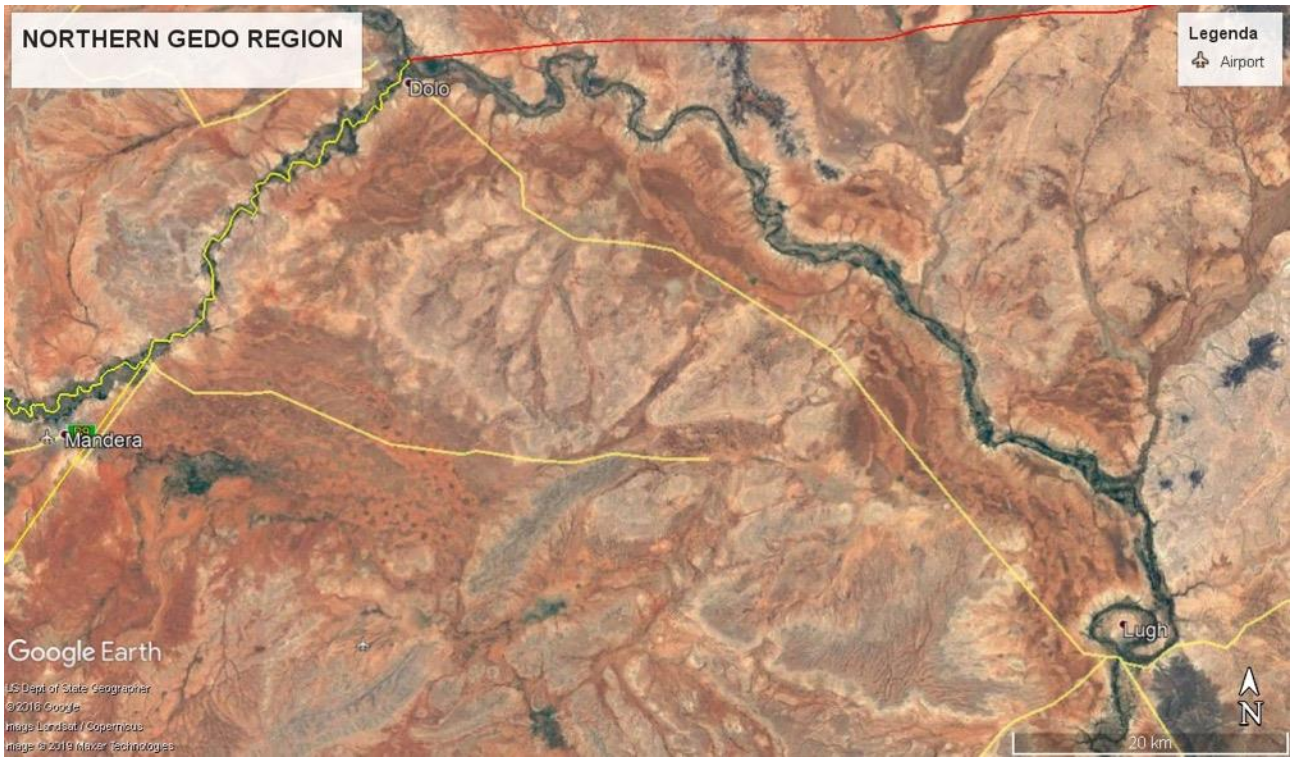
> Moving with herders implies moving beyond maps, taking advantage of multiple habitats across and within ecological niches. By moving with herders, one starts seeing signs that reveal the existence of connections among coexisting micro-zones. Tracks of birds, animals, people. The steps of excessively loaded donkeys. Printed trails of motorbikes. Spoils of hunted animals. The landscape is webbed with paths and footways. By moving, herders respond to the movement of their space, which restlessly decomposes and recomposes itself.[95]

Large-scale connections link various ecologies and also simultaneous times. Pastoralists may move between lowlands and highlands, or one can stay put and the other go 150 km away; shift places between wet areas and drier areas during rain seasons, between types of forage and water

[92] Among the Beja nomads of Sudan, there is no term for "person" but "responsible man/woman"; see Hjort af Ornäs & Dahl G, *Responsible Man. The Atmaan Beja of North-eastern Sudan*, Stockholm Studies in Social Anthropology, Uppsala 1991; pp. 69-74.
[93] Retaillé D & Olivier W, "Spaces of Uncertainty: A Model of Mobile Space in the Sahel", *Singapore Journal of Tropical Geography*, Vol. 32, No 1, April 2011; pp. 85-101.
[94] For the concept of "connectivity", see Retaillé D, "From Nomadic to Mobile Space: A Theoretical Experiment (1976–2012)", in Miggelbrink J, Habeck JO, Mazzulli N & Koch P (eds.), *Nomadic and indigenous spaces: productions and cognitions*, Routledge, London 2013; p. 59-75.
[95] Semplici G, *op. cit.*, p. 153.

sources; away from ticks and flies. Taking this into account, it emerges a complex web of socioecological relationships connecting heterogeneous ecologies.

In this mobile landscape, rain quantity and location vary without any regularity; clouds are unpredictable; quality of vegetation is an hazard; river levels go up and down without making sense: the Gedo Region is, literally, a mobile landscape that, in Luuq, sees a big river like the Jubba making a somersault before heading to the Indian Ocean (see Map 2.1, at low right).



Map 2.1. Physical features in the northern Gedo Region (Source: Google Earth)

Although Nuur said: 'There is no environmental change I ever noticed starting from my young-hood',[96] change is intrinsic in the Somali pastoralists' landscape. The problem is the control of its "health", action that may be considered blasphemy. As Mohamed – watching the receding waters of river Jubba after the last devastating flood of October 2019 – put it: 'Change of weather pattern? Sometimes cold, sometimes hot: this is due to natural events and it comes from Allah. It is out of our control'.[97] To follow the visions of Jim Morrison, 'This is the end, my only friend, the end / Of everything that stands, the end / No safety or surprise, the end'.[98]

[96] Bantaal, spotters' report, household 5, December 14, 2019.
[97] Bantaal, spotters' report, household 2, December 14, 2019.
[98] The Doors (Morrison J, Krieger R, Manzarek R & Densmore J), *The End*, Elektra Records, 1967; track 11.

SECTION 3 – OPERATIONAL RESEARCH TO ONE HEALTH

3.1 – WHAT IS BEST AND WHAT IF?

To underline the necessity of carefully operate inside all their multi-faceted "scapes", Somali say: '*Arrinxumo abaar ka daran*', meaning "A bad decision is worse than a drought".[99] To prevent any kind of disaster, one has beforehand to:

1. explore the surrounding land and the people living in it (research);
2. consider different options out of the problem (planning);
3. implement multivariate actions to solutions (operation).

Most development agencies in the Greater Horn of Africa deal with the task of 'understanding strategies, needs, perceptions and behaviours of local pastoral communities towards human and animal health, and their strategies of conservation of – and adaptation to – the environment, also in relation to climate change'[100] (now to be named a worldwide climatic crisis). After many experiences in the field among Somali and culturally related pastoralists, CCM developed a One Health (OH) model of informative Operational Research (OR) in the pastoralists' domain. Because we recently submitted a full document about this issue to the HEAL Consortium,[101] we do not go into details about the concepts of OR and One Health.

We just remind that ORs produce tools to support decisions meant to manage activities and resources, in order to maximize or minimize an objective in alien territory. Many variables can interfere in the scenario, but a nonlinear algorithm of an *ad hoc* OR is:

Contact with Donor/Agency → Programme analysis → Logistics → Insertion → Local authorities involved → Mobility guaranteed → Modelling → First field contact → Building rapport & trust → Local power assessed and involved → Assistants' training → Fieldwork at individual/household/small community levels → Gender issues acknowledged → Ecosystem analysis → Participatory exercises → Immaterial assets analysis → Territory mapping → Household budgets explored → Health systems (formal and informal) → Workshops, training and meetings → Pre-project designed and discussed → Informed consent formally obtained → Monitoring personnel funded and trained → Exfiltration → Reports (feedback) → Monitoring → Final assessment.

Even the One Health paradigm – as stressed by one of the authors of this report in many occasions – needs critical rethinking: OH must not be considered a mere sum of three elements, but a quantum leap of complexity involving three domains, the vector-product of human, animal and environmental health combined (entanglement[102]). CCM's field missions evidenced difficulties at all levels of management and implementation in keeping entanglement as the operational priority. As an example, see the narrow focus on zoonosis by veterinaries and epidemiologists; this is a very important topic – although not always in the perception of herders – but the

[99] An ample collection of proverbs is in: Hassan MS, Diiwaanka maahmaahyada. *A collection of Somali proverbs*, Scansom & Förlag, Järfälla, Sweden 1997.

[100] VSF-Suisse, CCM and ILRI, *One Health Units for Humans, Environment, Animals and Livelihoods (HEAL)*; Inception report for the opening phase of the project p. 32.

[101] Salza A, *Gedo Region of Somalia: Researching in the Field and from Remote. A OH Anthropological Research in the framework of HEAL*, CCM, Turin 2019.

[102] In quantum physics, a state is called entangled if, and only if, the state is correlated and not separable; see: Schneiderbauer L, *Entanglement or Separability: an introduction*, Bachelor Thesis, University of Wien, 2012; def. 2.6, p. 5.

environmental domain appears often neglected, from microbiota to vectors' ecology to extreme weather events. Without proper entanglement (not 1+1+1=3, but 1x1x1=1), the OH project framework might implode in self-referential activities.

Pastoralists do not live in a mapped environment (points, areas, borders) like us, scholars who accept only the 'metaphysics of sedentarism'.[103] They are 'phenomena of lines',[104] produced by movements that leave trails and tracks behind: their entwinement produces "plaid-patterned" landscapes[105] where the life/fabric of each element is bound up with the other. Therefore, like the mobile household units of pastoralists, a OH project should move along four trajectories:

1. pathway to health;
2. pathway to water and pasture;
3. pathway to communication and social relationships;
4. pathway to modernity.[106]

All these paths look forward, to the *future* and therefore, to change.

A Theory of Change (ToC), although criticised and somehow outdated (change is inherent in tools too), becomes necessary to prepare an appropriate tool to monitor plans and actions by development agencies, opening the space for accountability both to the agencies themselves and to the stakeholders involved in the process.[107] As written by Otto Scharmer:

> Basically, social change processes want to take us to a place where we have never been before. The agents involved imagine and visualize the future reality in a way that is not possible to fully understand at present. This is partly due to a fundamental fact: we project our possible futures based on the mind-sets we have at present day, so there are many aspects of the future impossible to grasp or visualize with the learning tools we currently have. That is why we need to develop new capacities to learn from the future as it emerges.[108]

Following these pathways, CCM – being a medical INGO – with HEAL consortium partners proposed an operational research based on medical anthropology and human ecology, utilising communication and modernity as a test in the field and from remote.

The OR's primary objective is to provide a decision support system to project designers, leading to a virtuous behaviour valid both for operators and communities, and for the environment where both are guests. About this issue, non-quantitative systems such as tradition, personality, choice ability, survival strategy, relationship with animals and environments, and so on, are to be studied. Our OR is meant to lead towards a development *from* local conditions and not *to* prefabricated objectives. A two-way communication system should enable all stakeholders to be part of the process.

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[103] Malkki LH, "National Geographic: The Rooting of Peoples and the Territorialization of National Identity among Scholars and Refugees", *Cultural Anthropology*, Vol. 7, No 1, February 1992; pp. 24-44.

[104] Ingold T, *Being Alive: Essays on Movement, Knowledge and Description*, Routledge, London 2011; p. 12.

[105] Guthrie RD, "Mosaics, allelochemics and nutrients: an ecological theory of Late Pleistocene megafaunal extinctions, in Martin P & Klein R (eds.), *Quaternary Extinctions: a Prehistoric Revolution*, University of Arizona press, Tucson 1984; figure 13.1.

[106] Kurewa A, Salza A and Abdirizaak Mohamed, conversation in North Horr, Kenya, November 2018.

[107] Retolaza Eguren I, *Theory of Change. A thinking and action approach to navigate in the complexity of social change processes*, UNDP Hivos, The Hague 2011; p. 3.

[108] Scharmer CO, 2007, *Theory U. Leading from the Future as it Emerges, The Social Technology of Presencing*, Sol Press, Cambridge (Ma), 2007.

Before getting to the formal structure of the specific OR in the field and from remote, we remind the two founding tools of ORs:

1. Optimization: the *what-is-best* approach points to a very good (optimum) or as-near-to-good-as possible (sub-optimum) solution of the problem (negotiated with the community; e.g., is it better to have more cattle and deplete the land, or goats and have less social status? Can we reduce the number of camels and give social status to farmland instead? Which values are going to be lost in both options?).
2. Simulation: the *what-if* approach explores different solutions to the same problem, by simulating a variety of situations and behaviours inside the OR Project Area (e.g., what if we train mobile health-household-agents to go along with the pastoralists? Or what if we empower instead the local authorities with means for permanent health posts? How would pastoralist react? Would their health improve or not?).[109]

As far as we are concerned, optimal options (what-is-best) and decided-upon hypothesis to action (what-if) should be inserted into a closed, although artificially defined, socio-ecologic system (SES), as much consistent as possible in human, livestock and environmental features.

3.2 – PROJECT AREA DEFINED

The Gedo (also Ghedo o Ghedu) Region (*gobol*) of Southern Somalia – one of the pilot zones for the HEAL project – has a surface of 60,389 km², with capital in Garba Harre (aka Garbxaarreey in Somali spelling). To reduce the extension of fieldwork in relation to timeframe and security, we limited the project area (PA) to the triangle with vertexes in Dollow, Luuq and Beledxaawo (where a VSF-Suisse base is located). These are District capitals and, because of their strategic position between Ethiopia (Dollow), Kenya (Beledxaawo) and central Somalia (Luuq), can be considered entry/exit points in/out Somalia (as per the HEAL project[110]). Dollow and Luuq are on the river Jubba, bordering the Somali Region of Ethiopia; Dollow is on the road from Filtu to Mogadishu, some 40 km from Beledxaawo, very close to Mandera, Kenya; Luuq is 72 km from Dollow. Distances, evaluated before the implementation of the OR, are of the utmost importance for the mobility of the health personnel and patients. Of course, as anywhere in Africa, distances are better understood in terms of travel time, but we did not find particular travel difficulties notwithstanding the recent floods in the area.

According to GPS data, Dollow and Luuq are at an elevation of little less than 200 m ASL. The river Jubba runs through a degrading alluvial plain towards the sea (southeast), mainly across the Luuq District (see Map 2.1). Towards the border of Kenya, south of Beledxaawo, the orography reaches the 600-700 m on a highland system.

From these environmental features we envisaged a human terrain where pastoralists move in transhumance routes from plains to highlands, in function of climate (seasonal rainfall), vegetation (grass typology and palatability), accessibility (terrain) and availability of resources (grazing lands). These movements criss-cross the fields of farmers, mainly along the river Jubba banks. The two systems, like CCM found in K'elafo and Filtu (Somali Region of Ethiopia), are traditionally complementary, and not in opposition (even if conflicts for water occur). For instance, livestock (cattle, dromedaries, shoats) are on purpose sent to the fields after harvesting; while eating the

[109] Salza A, "Remote Training Unit 3", Gedo Region OH OR by CCM, Torino November 2019; par. 3.2.
[110] *One Health Units for Humans, Environment, Animals and Livelihoods (HEAL)*, Inception report for the opening phase of the project (1st March 2019-30th May 2020) by VSF-Suisse, CCM-Italy, ILRI, CGIAR.

nutritious stubble, they fertilise the soil with their dung; each pastoralist family has a correspondent "step-relative" at the river, with life-long ties. Both systems, pastoral and agricultural, refer to the same small centres for services (health, provisions, markets, education).

Pastoralists are not isolated, unchanging entities: therefore we considered also urbanised pastoralists, agro-pastoralists and destitute pastoralists (IDPs). Consequently, in the PA we pinpointed five main socio-ecologic systems, all of them related to diversified health systems and access to health facilities:

1. lowlands (seminomadic pastoralism);
2. highlands (nomadic pastoralism);
3. river and alluvial plains (agriculture and mixed economy);
4. small towns and peri-urban belts (services, markets, urban livelihood);
5. IDP camps (totally artificial and alien to the surrounding ecosystems and livelihoods).

Five corresponding villages and settlements have been selected by the Somali assistant to the field research, Abdimaalik Issak, according to environment and typology (GPS data and distances are approximated):

1. Malkariyey, Beledxaawo District (11 km from Beledxaawo town): N 3° 58' 43" – E 41° 54' 57"; Elevation 165 m ASL
2. Sullale, Luuq District (9 km from Luuq town): N 3° 48' 49" – E 42° 31' 19"; Elevation 162 m ASL
3. Bantaal, Dollow District (9 km from Dollow town, 260 households, population 1560): N 4° 10' 46" – E 42° 6' 33"; Elevation: 141 m ASL
4. Tuulo Amin, Beledxaawo District (5 km from Beledxaawo town, 219 households, population 1314): N 3° 57' 23" – E 41° 53' 39"; Elevation 210 m ASL
5. Kabasa, Dollow District (3 km from Dollow town, artificial camp, population 4986): N 4° 09' 39" – E 42 05 26"; Elevation 187 m ASL

From the short distances, it is evident the caution we took before moving far from the main centres, where security from Al Shabaab (AS) raids and their intelligence scouting is somehow guaranteed. Some days before starting the field activities, CCM received a disturbing report from the INSO[111] about severe hindrances to be found for any movement by INGOs personnel from Dollow to Luuq:

> Inform your staff, including staff from your implementing partners, about the risk of kidnappings due to temporary take-overs by AS of villages on the Dollow-Luuq road. Avoid moving on the road. Even low profile or private movement of aid workers does not hinder AS from getting information.

Security in the PA is a priority. Therefore its definition, the extension and frequency of movements on roads and tracks, the identification of specific locations and the like, all this was monitored by CCM's HQ in Nairobi and decided upon after thorough investigations, following the advice of the local involved persons and authorities in Somalia.

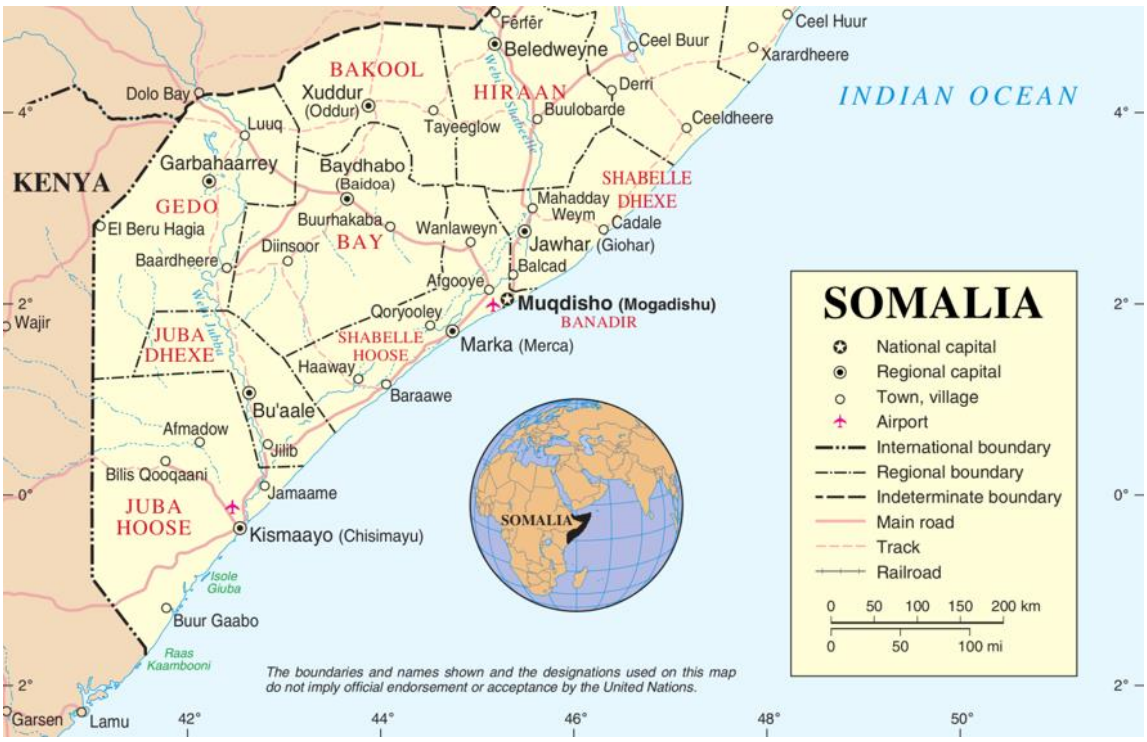
Fortunately, our assistant researcher in the field found no travel difficulty in the PA, as far as security was concerned. Apart from the hazards of a civil war zone, we must highlight, though, the intrinsic risk of making anthropological research (not a life-saving activity) in a place where taking GPS waypoints, asking questions about health, getting information on sensitive issues (like movements of people and livestock), visiting IDP camps, working for a foreign NGO, taking

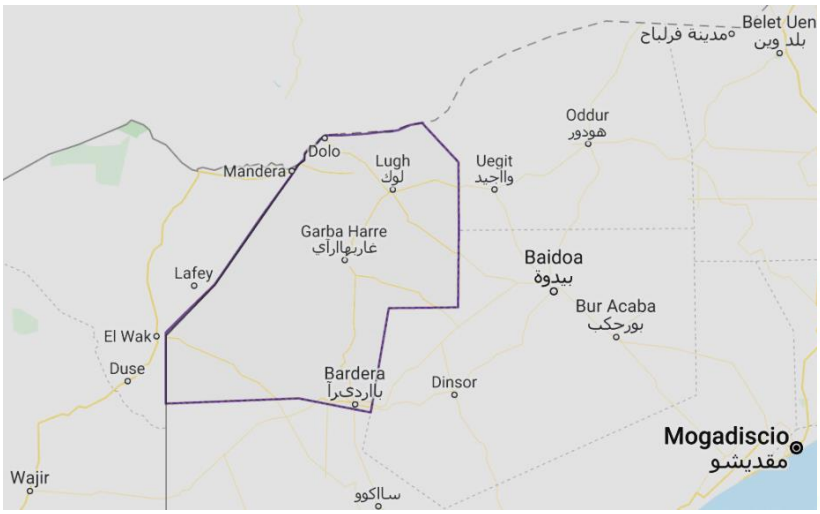
[111] INSO Somalia, "SOM-SOUTH CENTRAL - Geedweyne, Doolow, Gedo- Take-Over", Serial No 25/10/2019/1.

pictures, shooting videos, having daily Internet and WhatsApp contacts abroad, all this can be considered spying by a terroristic organisation and mean sudden death.

For all these reasons, the main decisions about movement inside the PA were left to the local personnel and authorities. We cite the words by Alessandro Guarino, CCM Country Representative for Kenya and Somalia, based in Nairobi:[112] 'For my experience in such security challenging contexts, people living in the area are very straightforward in telling you what can and what cannot be done. And also, to propose alternative options'. Local voices lead the way.

Down here, we insert three maps that include the Project Area. The actual triangle of the PA – Dollow, Beeldxaawo and Luuq – is better visible in Map 2.1. Detailed maps of Dollow, Beledxaawo and Luuq districts by OCHA (open source) are available in the folder GEDO REPORT MAPS, c/o CCM.





Maps 3.1: Southern Somalia (top), 3.2: Actual Gedo Region (bottom left), 3.3: old Gedo Region (bottom right, where PA is denominated Daawo); discrepancies in borders are due to the different open sources.

[112] E-mail of October 30, 2019.

3.3 – VOLUMETRIC ANTHROPOLOGY AUGMENTED

Practically, in 2020 Somalia is still an off-limits zone for expatriates engaged in humanitarian aid and, above all, field research. Therefore, CCM designed an innovative operational research, making use of local personnel for the field activities in Somalia and of experts for a training-on-the-job and follow-up from and by remote in Italy. The insertion of a trained local person inside the various typologies of communities of the Project Area (PA) was planned to bypass the intrinsic difficulties of the northern Gedo Region (security, mobility, accessibility, language barriers, trust, bureaucracy, terrain and more). In the meantime, an anthropologist – expert in One Health projects and pastoralists' human ecology – prepared distance-learning material, ran a gap analysis, developed *ad hoc* scientific knowledge-bases, and started interacting with the field researcher, daily training and tutoring his field activities.

To avoid the hazards of vocal transmission of information by phone or conference calls (uncertain connection, sound disturbance, white rumour, language barrier, misunderstandings, obsolescence), it was decided to use e-mail correspondence only. Written words remain, as the Latin said, while a Sahel proverb recites: "Spoken words are like eggs: once opened, they fly". As a second benefit, the exercise itself of putting in writing the daily field observation demonstrated to be an excellent learning/updating procedure both for the field and the remote researchers.

We are well aware that communication among Somali pastoralists in the Horn of Africa is primarily through word of mouth. Oral information is appreciated above all other forms of communication, due to the fact that a significant number of Somali pastoralists are illiterate, with the 2000-2006 adult literacy rate standing at 37.8%.[113] The traditional Somali lifestyle is fed by a continuous flow of news, because nomads need essential information on conflict, peace, good pasture or drought. Radio is considered the most powerful medium of mass communication in the Somali society: 35% of households in Somalia confirmed ownership of radios, while 60% of men, 43% of women, and 15% of children said they listen to the radio regularly.[114] This is just to demonstrate how the Somali pastoralists are prone to distance learning.

Given the well-functioning mobile network infrastructure in Somalia, cell phones are increasingly common[115] among pastoralists and used, for example, to share information about livestock market prices, weather, remittances, pasture availability, and water sources.[116] Internet, therefore, is becoming an accessible tool for development, not only justifying, but promoting its use for research in Somalia, in the field and by remote.[117]

Our projection about the OR results (see below) is optimistic, because they appear to be methodologically sound and aptly enhanced by the incoming 5G network:[118] we made a step towards "spatial anthropology", a volumetric research tool that will make use of live interviews, 360° videos, virtual reality, 3D graphics, augmented reality, GPS point cloud, and other

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[113] UNESCO, *Somali distance education and literacy*, in www.unesco.org/uil/litbase/?menu=4&programme=1002006.

[114] Carr-Hill R and Ondijo D, *Assessment of the education, livelihoods, living conditions and welfare of Somali pastoralists. A representative, multi-sectoral survey conducted to provide a baseline for programming*, Horn Relief/Adeso, Nairobi 2011.

[115] In June 2014, the CIA World Factbook reported 658,000 mobile phones in use in Somalia, with ownership rates at 78.5% in South-Central Somalia.

[116] Schelling E, *Enhanced enrolment of pastoralists in the implementation and evaluation of the UNICEF-FAO-WFP resilience strategy in Somalia*, UNICEF Eastern and Southern Africa Regional Office (ESARO), Nairobi 2013.

[117] According to Internet World statistics (IWS, December 2018), in Somalia there are 1,200,000 Internet users, 7.7% of the population, with 1,100,000 Facebook subscribers in December 2017, with 7.0% penetration rate; data available in https://www.internetworldstats.com/stats1.htm, lastly accessed on December 31, 2019.

[118] 5G is the fifth-generation wireless technology for digital cellular networks.

perception/observation/analysis utensils, providing sounds and para-physical interactions too. These paraphernalia are already utilised by the most updated journalism.[119]

Following this line of preparedness to the future (both for pastoralists and researchers), we chose an emergent, simple methodology commonly implemented by journalists in war and disaster zones: the stringer/spotter relationship. Adapting the concept to anthropologic research in the northern Gedo Region, a "pastoral spotter" is someone informed about his/her community, livestock and environment, able to observe and provide intelligence about the three of them. A "pastoral stringer" is a mobile field operator who feeds a static research operator with field notes, reports, images and information about a difficult or isolated zone, on an ongoing basis. The term "stringer" conveys the idea of adding "strings" to the raw field-information by spotters, before being conveyed to the head researcher for scientific elaboration and data dissemination.

Making use of hi-tech communication – but keeping paper, notebook and pencil at hand – we elaborated and implemented an innovative and replicable (in similar contexts) remote-tutored field-mission methodology, meant to follow, monitor and pilot step-by-step the activities in the field, the quantity/quality of gathered data, their reporting and two-way elaborations. The tutoring was achieved by a continuous flow of information from/to the expert anthropologist and a Somali public health operator, knowledgeable about local health systems, communities' social background, local people's behaviours and customs, environmental criticalities. The flow was activated and kept going by communication technology (Internet and, to a minimum extent, smartphones). Luckily, we were confirmed that networking was available throughout the Gedo Region, at least in its main centres.

Figure 3.1. Somali stamp, representing Africa and its telecommunication networking (Google open source)

[119] At the moment, a techno-advanced newspaper on this issue is *The New York Times*; see https://rd.nytimes.com/

3.4 – IN THE FIELD AND FROM REMOTE

The role of anthropology in development and health interventions started to be considered 30 years ago.[120] Anthropologist may identify and describe local knowledge/understanding of disease (cause, treatment and control), thereafter suggesting axes of intervention by health policy makers (e.g., awareness building, communication, education) and appropriate insertion of biomedicine in the local context.

In this scenario – complicated by the request of a "rapid assessment" (a bad practice in research) – the spotter/stringer system can work for collecting news, but may be insufficient to provide information at various scales of interaction, as required by anthropologic research. That is why, in the specific northern Gedo situation, we did not use single spotters, but five Household Spotting Units, composed of spotters from the same family for each environment identified in the PA (see above, 3.2). We remind that the household is the basic unit of all pastoral communities. That way we managed to deal in a single go with all problems of the community, including topics related to adults, youth, children, and age (plus gender). All this in a coherent selfie-like picture.

With one stringer and some Household Spotting Units we have a basic structure; its advantages are security, speed, flexibility, coverage, low cost, community approval and scientific data elaboration. Above the structure we had the research operator (anthropologist/human ecologist) who, by remote, trained, guided and monitored all the stringer/spotter field activities and data. The relational sequence by remote was of the following type, with the algorithm previously discussed, developed, ameliorated and continuously checked with the employed stringer, after having obtained an informed consent (FPIC)[121] by the communities. The "flexible protocol" was:

1. The research operator instructs the stringer from remote (training).
2. The stringer and HQ contact local authorities and get all necessary permits (legal positioning).
3. The stringer reaches the PA and its communities (inserting).
4. Two-way contacts from operator and stringer to deal with local authorities and community governance (tutoring).
5. The stringer pinpoints and trains the Household Spotting Units in the 5 social environments, with the help of the relevant communities and the research operator (tutored capacity building).
6. Two-way contacts operator/stringer to build awareness and collaborative relationships with local authorities and community governance (counselling and trust building).
7. The stringer moves into chosen localities of the PA, meeting the communities and their HSU (trust building).
8. The spotters start acquiring data that are transmitted to the stringer (collecting).
9. The operator follows all activities through the stringer (monitoring and steering).
10. The stringer daily downloads spotters' data, plus his own, in field notes and transmits them to the remote operator (narrative flowing).
11. The research operator corrects possible mistakes and twists, evidencing if the case the missing information (tuning).
12. The interaction is reiterated with the maximum possible frequency (every day) in a data flux and pre-elaboration (data cycling).

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[120] Manderson L, "Applying medical anthropology in the control of infectious disease", *Tropical Medicine and International Health*, Vol. 3, No 12, December 1998; pp. 1020-27.

[121] Free, prior and informed consent; the normative framework of FPIC consists on a series of legal international instruments including the UN Declaration on the Rights of Indigenous Peoples (UNDRIP), the International Labour Organization Convention 169 (ILO 169), and the Convention on Biological Diversity (CBD), among many others, as well as national laws. Operative information in the manual: AA VV, *Free Prior and Informed Consent. An indigenous peoples' right and a good practice for local communities*, FAO, 2016.

13. The operator, with academic help, extracts from the research data-base a knowledge-base (data + management) for the project necessities (elaborating).
14. The operator, the stringer and the spotters – at various levels and with different modalities – share and communicate the final exit of the research (reporting).

We tried and somehow managed to keep this algorithm going. An example of the procedure and its language is given in ANNEX 1, where we describe in detail the Dollow Health Centre visited at the beginning of the research.
Throughout the OR, the main constraint was time and not security as we supposed. Our timeframe was considering four weeks: one for training by remote of the stringer (distance learning), one for insertion (local authorities and HSUs identified and trained) and two for field activities and data gathering. Due to complications and misunderstandings, unavoidable with distance, cultural biases, inexperience, language barrier and so on, the fast schedule was beyond our capacities, but its structure remained intact and the activities were all accomplished, even if a varying degree of precision and intensity. After the four weeks, we took the necessary time for data elaboration and reporting outside the PA.

The timetable was organised after an introductory video-conference (for reciprocal knowledge) and some email exchanges for testing the communication system, while defining logistic details. After that, the research followed a time-routine (replicable) in three phases:

Phase 1: Training

In seven days, five pre-written, programming training units are sent to the stringer by the research operator.[122] Each Unit contains information and exercises. The Units deal, in sequence, with:

1. Anthropology and derivatives
2. One Health and generalities
3. Operational Research, Remote Control and Choice of Locations
4. The Stringer-Spotter system, extended to Household Spotting Units
5. Research tools, from interviews to FGD to ecology transects

The stringer reads and learns the concepts in Unit 1. Then he responds to the exercises, directly writing on the document of the Unit. As soon as possible, the stringer sends back the elaborated Unit 1 to the research operator, with answers, questions, comments and requests, if the case.
As soon as the feedback-augmented Unit 1 is received, the research operator analyses and edits it; then he immediately sends back to the stringer comments and suggestions, together with the Unit 2 (further elaborated according to the feedback material, if the case).
The stringer reads the comments about Unit 1 and then learns the concepts in Unit 2 and responds in written form to the exercises. The sequence continues up to Unit 5.

The routine cycle is repeated five times, leaving two days (out of the pre-determined seven) for elaborations and possible delays or communication failures. The two-way communication network from stringer to research operator considered the two-hour difference Kenya/Italy for its timing.

Phase 2: Introduction to local authorities, Project Area definition, Household Spotting Units choice

Day 8: The stringer meets the local authorities. After considering feasibility, security, opportunity and research objectives, they sketch together a proposed Project Area (PA). The stringer relays the

[122] At Olivetti, in 1968-69 the author of the training units, Alberto Salza, was part of a programme to train and form managing personnel, tutored by David J. Klaus, a behavioural psychologist, expert in distance learning. See: Klaus DJ, "An analysis of programming techniques", in Glaser R (ed.), *Teaching machines and programmed learning*, II, Association for Educational Communications and Technology, Washington 1965.

information to the research operator for comments and validation. The research operator sends his approval of the PA or suggests corrections.

Day 9: The stringer relays information to the authorities and prepares logistics for visiting the chosen localities of the OR, where to individuate the Household Spotting Units for further health information acquiring.

Days 10 to 13: The stringer visits the PA chosen locations (five) and contacts the relative Household Spotting Units for details about methodology and incentives (in money, as decided upon by CCM HQ and research operator).

Every day the stringer writes a mission report with details and sends it to the research operator who, after analysing these reports, steers stringer's decision-making by suggestions via email. In case of emergencies, the stringer can relay messages by phone to the Nairobi office, who relays them to the research operator in due time.

Day 14: At their home bases, the stringer and the research operator refine details. The stringer relays information to local authorities, if asked.

Phase 3: Field research and data acquisition

Days 15 to 26: Following what learned by the Training Units, the stringer starts activating the spotters' network, acquiring the data according to methodology. A day by day schedule is going to be agreed upon according to distance, security, availability of focal persons, etc. The proposed five research locations are visited and, possibly, revisited.

In this phase, the stringer has ample freedom of logistical and timing choice, but it is imperative that all information gathered in the field be relayed back to the research operator every two days maximum, in order to facilitate any steering intervention from remote by the research operator.

Days 27 and 28: Pre-analysis of data and closing of the Operational Research with the local authorities, the Household Spotting Units, and the focal persons in the communities.

During the following days, the stringer, on a voluntary base, may contribute to the final report writing by answering clarifying questions by the research operator.

This timeframe was duly followed, but with an interruption of some days decided by CCM after the first week, for financial reasons. The sequence was then restarted without structure changes or particular setbacks. Anyway, considering the hazards of failure in any of the phases, our suggestion is to double the OR time to consent proper attuning of all stakeholders, giving time to a wider informative bottom-up web to be developed on the terrain.

This operational research in the field and by remote was an experiment. It also helped in trying to deal with the anthropologic myth of "detachment" when facing alien communities. In our case, the physical distance between the "academic" anthropologist and the field researcher, himself part of the cultural set to be studied, managed to avoid the effect "vulnerable observer vs vulnerable observed" in gathering qualitative data from the field, information that remains anyway laden with alien values, both sides.[123]

3.4.1 – The Tree of Health

Talking in metaphors is an essential part of the pastoralists' rhetoric. In Ogaden, we have been told by an elder: 'Poetry is leading our actions, followed by theatre'.[124] Among these herders – like in other pastoral contexts – those who demonstrate the ability to construct rhetorical expressions

[123] Behar R, *The Vulnerable Observer: Anthropology that Breaks Your Heart*, Beacon Press, Boston 1997.

[124] Salza A, field notes of the European Commission and CCM's project *Support to the traditional social system of Somali nomadic Pastoralists*, K'elafo Woreda, Gode Zone, European Initiative for Democracy and Human Rights - Micro-Projects Ethiopia, 2005-06.

are regarded as qualified orators, "gifted men", able to use poetic genres to convey social messages. In the Somali poetical culture, women have a fundamental role: the *buraanbur style*, reserved to women, is highly appreciated by all Somali.[125] Therefore, in the training units we managed to convey some useful metaphors to be used in the first approach to informants, like we previously did in similar occasions and contexts.[126]

One Health must be described in the terms of the involved population; therefore, we used the metaphor of the three stones of the ubiquitous African fireplace: without one of the stones, no matter which, it is impossible to cook. To describe our OR, instead, we resorted to a metaphor that is familiar both to biomedicine/computer science and to pastoralists' information networking: the tree-structure, although trees are disappearing in the PA at a worrying pace, like stated by Husen: 'Men are cutting the live trees for economical purpose, making charcoal'.[127]

The Somali genealogy system, or "counting of fathers" (*abtirsinyo* or *abtirsiimo*), is like a tree. Its roots and branches provide Somali people their social positioning. In order to bypass local adverse conditions and build an efficient flow of information, the OR in Gedo Region was designed like a tree-structure. At the roots, there is the research operator, an anthropologist who can "tap" scientific knowledge for the tree growth. He trains, guides and monitors all the stringer/spotter field-activities and data.

The trunk is the field researcher (the stringer), who passes information up and down the tree. The branches are the groups of people involved by the stringer (called spotters), who grow from the stringer and relay back information to trunk and roots. The leaves are all pastoralists involved in the OR: they transform light (Somali culture) in energy (decision-making), giving strength to branches, trunk and roots.

This tree-structured OR has some advantages: security, speed, flexibility, coverage, low cost, community approval, replicability, and facilitated scientific data elaboration. After running some cycles of the sequence, all participants could be inserted in an upgrading system, in order to widen the distribution of stringers and Household Spotting Units, either deeper in the PA or wider into other project zones and regions. By this, an operator by remote becomes a regional coordinator; a stringer substitutes the operator; spotters are trained to be stringers (at household level first, then at community's); and more spotters become initiators and facilitators among the pastoralists' communities, while providing information through the cycle by remote.

By mirroring sequences, in a multiplying geometrical effect the algorithm by remote is to be considered replicable in variate contexts, with the training units section modified in order to answer the needs of *ad hoc* diversification, project by project, area by area, locale by locale, community by community.

3.4.2 – Dances with Camels

Notwithstanding we saw a progressive decline of the camel as a status symbol and economy main asset in the PA, titling this paragraph[128] we tried to keep "seeing like a herder", for whom the "white dromedary" is still the epitome of Somali pastoralism. Walking with camels is a consuming exercise. Camels keep a steady pace: 74 steps per minute, even on sand; while following them,

[125] Abokor AA, "Classification and role of pastoral poetry", in Hjort af Ornäs A (ed.), op. cit., pp. 107 and 115.
[126] See Salza, A, "Oral stories", annexed to the North Horr field notes, Word document, c/o CCM, Turin 2019.
[127] Interview by HSU at Malkariyey (Beledxaawa District), semi-nomadic pastoralists in a plains area, December 12, 2019.
[128] The title echoes *Dances with Wolves*, the Oscar-winning movie by Kevin Costner (1990).

your rate goes to 102 steps on harder terrain.[129] Not to be left behind and die, you need rhythm, cadence and *glissade* like in a ballet.

In our remote-tutored research, operator, stringer, spotters and the community had to be synchronized like in a ballet, whose plot contained an *entrée* (training), an *adagio* (contact with authorities and insertion in the community) and a *pas de deux* (interaction operator-stringer), with a *variation* for each dancer (feedback correspondence), some *hesitation* (doubts and setbacks) and a *coda* (reporting).[130]

Starting from the Somali consideration for the arts, we considered the remote-tutored field-research like a collective dance: music, rhythm, dancers and audience must perform like a single coordinated entity. Instruments play an attuned harmony, dancers follow each other with their eyes, arms, legs and feet, the audience clap hands and sings along, keeping the tempo and giving energy and meaning to the whole performance. The dance is fluid like running water.

The Gedo Region Operational Research (OR), like any dancing, was made out of four agents:

1. "Music": the One Health HEAL project framework, methodology and objectives; it was the binding element, and it dictated time, mode and ways to research local health systems of any kind (public, private, traditional).
2. "Rhythm": the two-way, remote-tutored sequence of events; it was the timeframe for a continuous flow of health- and culture-related information from and to the field.
3. "Dancers": the research operator, the stringer, the members of the Household Spotting Units; they were the coordinated actors of the One Health OR.
4. "Audience": the categories of people (nomadic pastoralists, semi-nomadic pastoralists, agro-pastoralists, urban former pastoralists and destitute pastoralists) in the five chosen locations; they represented the feelings and perceptions towards livelihood and health in the Gedo Region communities.

Remember: in its origin and development, dance is a social activity; the dancers perform *for* the audience and *with* the audience. This means that the research operator, the stringer and the spotters had always to consider the local communities as their responsibility, and perform in accordance with the local culture and knowledge. The people in the northern Gedo Region are not "beneficiaries": they are active participants to their health and development.

3.4.3 – Tools of the Trade

Making and using tools is a "scape" in itself, what anthropologists call "taskscape".[131] The necessary sequence to accomplish something "done", the *chaine opératoire*,[132] is imbued with rhythm and symbolism, like in the case of the Gedo OR. Moving about and inside a studied and understood ecosystem, an ideal and appropriate operational research to OH should be conducted, with multiple data-collection and social enhancement tools, like the ones described in the following list, where we added in square brackets our setbacks in the northern Gedo Region:

- Surveys on foot. [unfeasible because of security in the pastoral transhumance areas]

[129] Salza A, "Le strade del deserto", *Airone*, No 217, Giorgio Mondadori, Milano May 1999; p. 88.

[130] "Glossary of Dance Terminology", compiled by the Practice Committee Performing Arts Special Interest Group, Orthopaedic Section, APTA, January 1998, in https://www.orthopt.org/downloads/PAglossary.pdf, lastly retrieved on December 30, 2019. *Hesitation* is a typical step in slow-waltz dancing.

[131] Ingold T, *op. cit.*; p. 158; see also: Ingold T, *Making. Anthropology, archaeology, art and architecture*, Routledge, London 2013; Ch. 3.

[132] Leroi-Gourhan, *Le geste et la parole. La mémoire et les rythmes*, A. Michel, Paris 1965; Ch. 11.

- High mobility by car, with roads used as human, animal and environmental domain transects. [not performed, see below]
- Unstructured informal interviews – in rural areas, pastoral routes, grazing spots and in towns – of men and women, public health personnel, health private practitioners, others. [accomplished only in villages and settlements near the main towns of the PA, and not at full capacity because of time]
- Non-scheduled informal focus group discussions at household clusters. [performed throughout the PA, with good results]
- Scheduled meetings with local authorities at all levels. [well accomplished in the second week of the OR, at Region, District and Community level]
- Participatory mapping and activity calendars. [this exercise is time-consuming and it was decided to cancel it]
- Structured seminars and workshops. [this tool is to be used in the future, when a structured long-duration project is going to be implemented]
- Capacity building activities with assistants/interpreters, drivers and personnel. [valid for stringer and spotters, but impossible to assess for the others from remote]
- Dissemination of all findings and methodologies. [to be implemented in the next future, when reports and specific materials are ready]

We can see that the utilised research tools were the standard ones in anthropology: structured and semi-structured interviews, focus-group discussions, locally elaborated question lists, mapping, community involvement, official meetings with local authorities,[133] lay conversations, data diffusion and sharing. Although the stringer was using a car for his mobility in the PA, we did not manage to get ecologic transects along the roads (transhumance routes were far and hazardous) like we did in previous human ecology researches among Somali pastoralists. The stringer, a human health expert and co-author of this report, admitted his inability to recognise the various types of vegetation; at the same time, stopping along the road and take photographs for relay to the research operator (a human ecologist) was considered too risky security-wise. Participatory exercises, like household budget, activity calendar, transhumance routes and health facility mapping, were too time-consuming to provide reliable information in just two weeks of fieldwork in five locations; so we decided to leave them out for further investigation.

[133] Meetings, FGDs and Spotters' data are transcribed in the external Annexes A, B and C, c/o CCM.

SECTION 4 – OUTCOMES & DOWNCOMES

4.1 – A SPECIAL OPERATION

The framing space of a research is never complete, but always under construction, just like the "desertscape" of pastoralists, wrongly considered by humanitarian agencies and most of academia a static nothingness. The herder, instead, frames behaviours inside an ongoing production of space-time, by injecting mobility into the landscape itself.[134] In parallel, the anthropologist evolves his/her glance and reference, moving about and routinely updating discipline and methodology.[135]

The Operational Research in the northern Gedo Region was an experiment: something similar, as far as the authors know, was never tried before by anthropologists, although the military make use of similar techniques in special operations. The experience in the field and from remote provided diversified results: some positive, some neutral (no additional knowledge), but none utterly negative.

The first positive outcome is readable in the previous Sections: the "remote anthropologist" had ample time to run a gap analysis, to organise the literature reference, and to respond to the ongoing variations and requests by the field operator, the stringer. Most of the considerations and baselines of this report were elicited by and during the field research.

After the due preparatory training and reference work (ongoing throughout the research), the live two-way communication produced in the research operator situations like the need to rapidly consult a reference book for information or browse a dictionary when a word is missing or misunderstood. Conversely, the field researcher was not an automaton, because he could *feel* to be assisted and that his findings were daily modifying the research processes. All considerations and data cited above and below come from this kind of procedure or by our previous experiences and knowledge.

The second positive outcome is visible in the Training Units progress (readable in full, with answers by the stringer and comments by the anthropologist, in the folder GEDO REMOTE TRAINING UNITS, c/o CCM). The activity managed to build both competence in the stringer in the field (at an acceptable level, because of short time and gaps in academic background) and trust in the research operator from remote, whose biased knowledge about Somali pastoralists was any moment at stake. If this kind of exchange managed to cascade on spotters also (something to be monitored in the near future), the result is going to be an informative/formative network directly implanted in the chosen human terrain.

Neutral results are in the realm of our OR field data. The local situation (innovative methodology, short time, security, routine precedents, diffidence, desire to please) determined a form of standardisation in the respondents' answers about health in the three domains of OH (see below, 4.2). About this, we have also to consider the statistical irrelevance of the sample: one stringer, five Household Spotting Units and 20 households in 5 localities.[136] Therefore, we decided to forget about percentages and indicators. We remind the reader that operational researches tend to *qualitative* data. Health itself is perceived by most people in the world as a holistic quality and not a *quantitative* sum of body exams' results.

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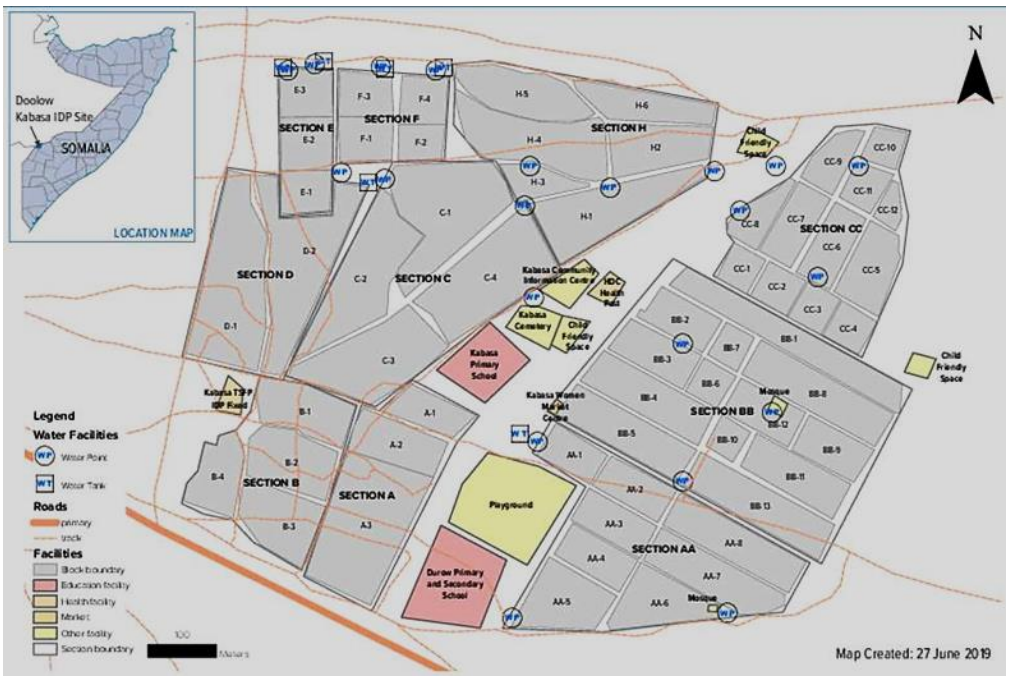
[134] Semplici G, *op. cit.*; p. 146; see also: Adey P, "If Mobility Is Everything Then It Is Nothing: Towards a Relational Politics of (Im)Mobilities", *Mobilities*, Vol. 1(1), 2006; p. 90.

[135] Full discussion in Clifford J, *Routes: Travel and Translation in the Late Twentieth Century*, Harvard University Press, Cambridge (MA), 1997; Ch. 3.

[136] See Annex C in the folder GEDO REPORT ANNEXES, c/o CCM.

4.2 – EVERYBODY IS EQUAL BEFORE THE HEALTH

In the last twenty years, the most dramatic change in the northern Gedo Region was in demographic composition and density. Reporting from the Kabasa IDP site, the stringer wrote: '50% of Somali clans are living in this camp, but most are from the Rahweyn and Marihan communities'.[137] This means that, at least in refugee camps, identity is diluted and shuffled, culturally and genetically speaking. But these sites are not landlocked: they are porous to influxes (controlled) and exits (voluntary). Furthermore, out of emergency, they are not planned according to the local culture, but to official efficiency, as seen in Map 4.1, where the artificial settlement has no trace of the pastoralists' alignment of huts, or of the chaotic Arab-style Somali town.



Map 4.1. Kabasa IDP site (Source: UNHCR)[138]

According to the stringer Abdi Issack, 'Kabasa IDP camp is about 5 km^2, hosting about 5,000 people. The community is arranged in rows called blocks. This resemble a well-designed city, each block with roads in between. Inside the block, the IDPs' shelters are divided into zones and then into sections. But the houses are made of plastic sheets provided by NGOs and some are semi-permanent, made of mud bricks and iron corrugated sheet. When I met the first spotter selected by the chief, he told me that the house his family was living in (7 people, sharing three mosquito nets) was made of makeshift materials, like plastics and clothes. Whenever IDPs want to shift to other areas, they dismantle the whole concoction and go.[139] The main water system the camp uses is a pipeline supported by a local organization. When I asked about the rubbish, the spotter showed me scattered waste and plastic bags. There is no nearby firewood: "To get it, we have to travel with donkey carts for almost one day, and there is no free electricity in the camp. It is owned by the private sector and is quite expensive for people like us", added the HSU spotter'.

[137] FGD in Kabasa IDP camp, December 16, 2019.

[138] In https://data2.unhcr.org/en/documents/details/70801, created on June 27, 2019.

[139] The stringer did not go deeply into the IDP's mobility issue; therefore we have no data about decisions and permits inside Kabasa IDP camp. Apparently, a high degree of free-movement is allowed, complicating any demographic analysis but head-counts.

Figure 4.1. Kabasa IDP makeshift shelters and water jerrycans (courtesy of Abdi Issack)

In an environment like this, but also all over the PA, if the ongoing clan mutation has potentially positive outputs – reduced antagonism, conflict resolution, democracy enhanced, women's empowerment (all health-sensitive features) – the high density pressures we evidenced in paragraph 1.2.1 may dramatically change the perception of the "other", leading to a "*craquelé* uniformity".[140] The crackle effect, well visible in the *Mona Lisa* by Leonardo da Vinci, results out of drying, aging, patterning, or a combination of all three; among the pastoral communities of the northern Gedo Region, density worked in a similar way: it dried up identities, made old traditions obsolete and patterned new behaviours.

Anthropologic research among hunter-gatherers showed that a low population density allows a group to consider the "others" like beneficial for barter, exogamy, technique exchanges etc. When density reaches a certain peak, the "others" become invaders, women rapists, competitors over resources, enemies. A high-density network implies highly standardized values conditioning individual behaviour, while low density is correlated with strong individualism.[141] Between the two phases, like amongst the Gedo pastoralists, behaviour tends to become uniform, but with evident (although thin) lines of *craquelé*. That is what our OR found out in the field: the discourse about health tends to become normative, with everybody conforming to pre-determined answers, notwithstanding the presumed differences in ecology and economy that are the baselines for our OR. The uniformity in answers (see below) highlights a probable degree of cautious disguise too, like in any other Shatter Zone.[142]

[140] The French term refers to a fine pattern of dense cracking formed on the surface of materials. It is most often used to refer to tempera or oil paintings.

[141] Turner JH and Maryanski A, "Network analysis", in Turner JH (ed.), *The structure of sociological theory*, Wadworth, Belmont 1991; pp. 540-72.

[142] A belt of randomly cracked rock that may be filled with mineral deposits. Its meaning (XIX century geology) shifted dramatically after WW II when it began to be used in political geography to denote borderlands, especially ones to which refugee populations migrated in large numbers to escape the pressures of the State and/or the capitalist economies through which the state exerted itself; see also Salza A, *Eliminazioni di massa. Tattiche di controgenocidio*, Sperling & Kupfer, Milano 2012; p. 121.

In any case, we tried from the very beginning to diversify questions and topics according to the supposed differences in habitat and economy. The OR suggested a series of issues to be investigated, above all in FGDs, by the stringer and, subsequently by the Household Spotting Units. These were the outlines to be followed:

- Sullale: supposing that the population is composed of nomadic pastoralists in a hilly area, deal about people-with-livestock in type-1 rangeland. The focus is on the zoonosis, diseases transmitted by animals to men, and vice versa (focus on Animal and Human Health in open Environment).
  Explore: a) local knowledge about zoonosis common in Sullale (symptoms, effects, animals involved, traditional prevention and cures); b) seasons and localities of zoonosis outbreak (when and where they are more frequent: rain/drought, plains/hills); c) veterinary and/or medical services available to the community (name and distance, validity of personnel and drugs availability, awareness campaigns, breakout responsiveness); d) other opinions about livestock and sickness (ticks, parasites); e) zoonosis more frequent in men/women/children; f) other diseases considered important in Sullale and next grazing areas; g) perception of weather and climate variations.
- Malkariyey: supposing that the population is composed of seminomadic pastoralists in a plains area, deal about people-with-livestock in type-2 rangeland. The focus is on principal diseases in people and livestock in the zone (focus on Animal and Human Health in open Environment).
  Explore: a) most common diseases in people and livestock around Malkariyey (name, symptoms, effects, traditional prevention and cures); b) most feared diseases in people and livestock; c) veterinary and/or medical services available to the community (name and distance, validity of personnel and drugs availability, vaccination campaigns); d) guidelines to improve health services on the rangeland, both for humans and animals; e) perception of weather and climate variations.
- Bantaal: supposing that the population is composed of agro-pastoralists along a river, deal about farmers with few domestic animals in a riverine habitat. The focus is on malaria and dengue with their determinants (focus on Human and Environment Health, with Animal vector-borne diseases).
  Explore: a) presence and gravity of malaria/dengue cases (prevalence in men, women, children, old-aged); b) perception and description of symptoms; c) traditional prevention and cure; d) medical services available to the community (name and distance, validity of personnel and tablets availability, Government campaigns); e) knowledge of the malaria/dengue cycle in local weather and environment (connection to rainy seasons, water pools, mosquito bites); f) guidelines to improve malaria/dengue control along the river (cleaning of rain-pools, mosquito-nets, tablet distribution, other); g) other diseases of importance, especially if attributed to the diet (poor in animal proteins, high in vegetal vitamins); h) perception of weather and climate variations.
- Tuulo Amin: supposing that the population is composed of former pastoralists in urban settings, deal about people exposed to risks from hygiene (bacteria and pests) and environmental pollution. The focus is on urban diseases (Human and Environmental Health, with microbiota-borne diseases).
  Explore: a) overall conditions of water, sanitation and hygiene (WASH); b) household water use (availability, consumption, perceived quality); c) pit latrines (yes or no) and how many per inhabitants; d) perceived causes of epidemiologic diseases (dysentery, diarrhoea, hepatitis, flu, pulmonary tract diseases, others); e) pollution and cancer; f) referral and health facility conditions and use (good/medium/bad, frequent/rare); g) other health issues considered important in Tuulo Amin; h) perception of weather and climate variations.
- Kabasa: supposing that the population is composed of destitute pastoralists in an IDP camp (artificial habitat), deal about persons that were exposed to high levels of health stress in a war environment (evaluate their former pastoral life with today's one). The focus is on stress (Human and Environmental Health) and malnutrition with consequent health effects.
  Explore: a) WASH conditions of camp; b) population density (how many people on the camp surface); c) problems of being densely packed; d) self-perception of war stress symptoms; e) participatory activities to check and reduce stress; f) perception of quality of medical facilities and services in the camp (good/medium/average); g) nutritional problems as perceived and narrated; h) considerations about the official statistics concerning health and nutrition in the camp; i) most

dangerous disease according to the IDPs of Kabasa; j) guidelines to improve health conditions; k) perception of weather and climate variations; i) comparison of nomadic *vs.* settled life.

The data coming from the field are not enough for any statistical analysis; they provide anyway a glimpse of the real or presumed conformity of perception towards the health of people, animals and environments.[143] The stringer managed to involve, in the 5 locations of the PA, 5 households with potential spotters (usually, the head of the family or an educated son[144] took the role); in some ten days the whole group of HSUs, managed to involve and question 20 neighbouring households in their settlements, from a minimum of 3 to a maximum of 5 per each HSU. The stringer, in the meantime, could organise and perform 9 FGD in the 5 localities, after having informed all types of local authorities in a series of official meetings.[145] If we consider that 4 localities (IDP camp apart) were composed by two to three hundred households, and each Somali household has an average of 6 members – as per official data[146] and our field research (although we had higher numbers in the most urbanised cases, up to 14 members) – we may have visually contacted from 5 to 6,000 people, and talked to more than 200 people. The result is a long series of answers and few requests. Hereafter we are going to read some of the field material, with both the conformist and the divergent opinions about the three OH domains.

Keeping in mind the criticism about the disaggregation of the three OH components (see above, 3.1), we decided to anyway operate a tripartite subdivision of data, going against the due entanglement only for easy-reading sake and report over-simplification.

4.2.1 – Human Health

We have already exposed above some of our findings about the perception of Somali pastoralists in the domain of their personal health (see 1.1 and 1.3). Here we give voices to the people themselves.

Stringer: 'Bantaal has one human health post constructed with the effort of the community and World Vision; it has no private pharmacies or itinerant human doctors. Waste pollution? There was no pollution in the village. There were some toilets: five households are using one toilet'. [former pastoralists, now river-bank agriculturalists, December 02, 2019]

FGD in Malkariyey (28 women, seminomadic pastoralists in the plains, December 4, 2019):

Muslimo: 'Common cold (*hargab*) can only be prevented by avoiding contact with an infected person'.

Nuurto (raising her hand): 'Common cold can be prevented thorough critical hand washing'.

Caasho: 'Common cold can be prevented by avoiding sneezing in over-crowded areas'.

Shamso: 'Traditionally we give some herbal medicine and animal soup to relieve common cold'.

Muslimo: 'Dengue gives high fever in the first day. We avoid any drugs and only promote showers'.

Caasho: 'Once my child got dengue fever and I took him to the human health post, and the doctor gave him paracetamol for three days and my child got cured'.

Shamso: 'Malaria is also a problem for our village'.

Nuurto: 'The only way we can prevent malaria is making smoke during evening time; then the mosquitoes disappear'.

Muslimo: 'It is good, that is our natural method, but we also use mosquito nets during night time'.

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[143] We remind the reader that the northern Gedo Region is not ecologically and climatically uniform; anyway, we suggest further specialised environmental research in the PA.

[144] Having a component of the HSU with writing abilities and a cell-phone was a prerequisite in the stringer's choice.

[145] All meetings minutes, FGDs transcriptions, stringer's and spotters' field data are reported in the folder GEDO REPORT ANNEXES, c/o CCM.

[146] *Household Size and Composition Around the World*, UN data booklet, 2017; p. 12; these data are for the whole Somalia, and might be diminutive for the demographic pressure of IDPs and refugee relatives in the PA.

Figure 4.2. Women's FGD in Malkariyey

FGD in Tuulo Amin (12 men and 29 women, former pastoralists in urban setting, December 11, 2019)

Amina: 'Diarrhoea is affecting children under five'.
Zaynab: 'Diarrhoea does not affect only under five children, it also affects adults'.
Nuurto: 'What is the cause of diarrhoea?'
Zaynab: 'The cause of diarrhoea is unknown'.
Halima: 'Diarrhoea is due to the season, and it will disappear'.
Amina: 'Diarrhoea is caused by poor hygiene'.
Ali: 'What is diarrhoea?'
Nuur: 'Diarrhoea is frequent loss of watery stool for three or more times in twenty-four hours'.
Yusuf: 'The cause of diarrhoea is due to germs'.
Abdi: 'Does diarrhoea have a vaccine?'
Ali: 'No'.
Mohamed: 'How can we treat it? We give the person some meat soup'
Abdi: 'When a person gets diarrhoea, all the body fluids get lost. So the person needs ORS, that we call *milankashifo*. If we don't use toilets and keep our environment clean, defecation in the open can transmit the disease from man to animal and from animal to man'.

FGD at Malkariyey (10 men and 15 women, semi-nomadic pastoralists in a plains area, December 12, 2019

Sacdiyo: 'What is dengue fever (*kaduudiyow*)?
Muslima: 'Dengue fever has an unknown origin. It brings high fever'.
Sahro: 'Dengue is not unknown: it is kind of malaria'.
Sacdiyo: 'This is not the malaria we used to know'.
Xabiibo: 'Which are the signs to recognize this disease?'
Muslima: 'Fever and severe muscle pains'.
Najma: 'This disease is transmitted by a kind of mosquito that bites human beings during day-time'.
Sacdiyo: 'Does it have a cure?'
Najma: 'It has no cure like malaria, but can be prevented through the use of mosquito nets'.

FGD at Sullale (nomadic pastoralists in hilly rangeland, December 14, 2019).

Asho: 'Malaria is transmitted by mosquitoes. I believe that dengue is also malaria'.
Abdia: 'You are true: malaria is transmitted by mosquitoes and dengue also is transmitted by mosquitoes. But dengue is new to us'.
Zaytun: 'Can malaria be transmitted from animal to man?'
Maryam: 'No, it only transmits from man to man through mosquito bites'.
Asho: 'How can we prevent ourselves from malaria?'
Zaytuna: 'We can use mosquito repellent'.
Maryam: 'What is mosquito repellent?'
Asho: 'It is a cream you apply to your body, and mosquitoes will not bite you for one to two hours'.
Zaytun: 'We can also use mosquito nets during day and night time'.

FGD in Tuulo Amin (former pastoralists in urban setting, males, December 5, 2019)

Ali: 'What do we know about hygiene?'

Qasim: 'Hygiene means keeping clean the children under five'.

Nuur: 'Hygiene, for me, is keeping one's body clean".

Ali: Hygiene is different if you consider personal hygiene and family hygiene. Personal hygiene is to cut your hair or shave to protect yourself from lice infestation and skin diseases like scabies (*nadaamis*).

Mohamed: 'Personal hygiene is cutting your nails, brushing teeth, and washing clothes'.

Qasim: "There is one vital thing I want to add: bathing or having a shower every day, once or twice'.

Figure 4.3. Men's FGD in Tuulo Amin

FGD in Kabasa (destitute pastoralists in IDP site, December 16, 2019)

Faisal: 'There is a new human disease in our camp, called dengue fever'.

Mohamed: 'How does dengue transmit?'

Adan: 'From animals to man'.

Faisal: 'I think that is not right: the dengue is transmitted by mosquitoes from man to man only'.

Mohamed: 'Mosquitoes are a problem. How can we eradicate them?'

Abdi: 'We can eradicate by clearing the bushes around our houses'.

Faisal: 'We can also eradicate by draining water and burning the empty cans, because this leftover water enhances the breeding of mosquitoes'.

Adan: 'We have to use mosquito nets regularly, especially at night time'.

Mohamed: 'Malaria eradication needs community involvement and efforts through the community's mobilization and training'.

Spotter: 'When a person gets very sick, we take him/her to the Luuq health facility. But before taking the sick person to referral we, as a community, take him/her to the sheikhs; Quran is recited on the sick person; only if the person does not improve, we take him/her to Luuq Hospital. At the moment many under 5 children have pneumonia (*burunkiito*)[147], plus diarrhoea (*shuban*). There is also a new type of fever in the area next our villages and many people get sick. This new fever is called dengue (*kaduudiyow*). Currently most of the herders are coming back to the village since there is enough pasture for the animals. We believe the disease was brought by those who came back after a long drought that displaced them from their original sites'. [Sullale, nomadic pastoralist in a hilly rangeland, December 8, 2019]

Stringer: 'The spotter told me that in his family recent diseases are diarrhoea and malaria; he believes diarrhoea is more serious, especially for children under 5, if not treated early. Tuulo Amin, with a population of 1,314, has one health post with one community health worker only. The available drugs are: paracetamol, aspirin, ORS, albendazole, vitamin A, micro nutrient powder. The health post worker

[147] The word has a clear origin from the Italian *bronchite*, bronchitis.

reports to Beledxaawo health centre, but does not provide vaccinations for children under five and PLW. There was a vaccination campaign last month against measles and polio'. [former pastoralists in urban settlement, December 5, 2019]

Spotter: 'If I have to rank human disease here, I'd say: 1) malaria (*xanuunkaduumada*); 2) dengue; 3) diarrhoea. [destitute pastoralist in Kabasa IDP camp, December 3]

Ahmed: 'The overall health condition of the household is good, including women, children and adults and teenagers, apart from common cold. Common cold has affected almost everyone, and we are now recovering from it'. [informant to HSU, Bantaal, December 15, 2019]

Shamso: 'The recent diseases in our household are common cold and malaria'. [informant to HSU, Bantaal, December 15, 2019]

Nuria: 'We refer our sick children and adults to the available clinic and if the patient is very ill, we refer to Dollow health centre using donkey carts for transport'. [informant to HSU, Bantaal, December 15, 2019]

Mohamed: 'The overall health of my family is good, but my father is sick with dengue; he has fever, headache and joint pain. He could not come out of the house for the last two days. All other family members are doing good and they are healthy'. [informant to HSU, Bantaal, December 15, 2019]

Shuceyb: 'The dengue fever is due to mosquito bites during the day. Common cold is transmitted from one person to the other and it is quite diffused during the rainy season. So, according to my perception, I can call it seasonal flu'. [informant to HSU, Bantaal, December 15, 2019]

Sumeya: 'We refer our sick people to Bantaal clinic for treatment; we also have another option, that we prefer: calling sheikh from the mosque and reciting Quran on the sick person; *dua* prayer will be recited'. [informant to HSU, Bantaal, December 15, 2019]

Nuuriya: 'There is fever in every household, maybe malaria. I myself have fever, headache and joint pain'. [informant to HSU, Malkariyey, December 12, 2019]

Abdia: 'When we get sick, we refer our people first to our sheikhs. They recite Quran, pray and then we take them to the health clinic'. [informant to HSU, Malkariyey, December 12, 2019]

Caasho: 'The most recent diseases in the family for the last month were malaria, common cold and dengue'. [informant to HSU, Malkariyey, December 12, 2019]

Duniyo: 'There is no bush doctor in our village. Rather than that, we prefer the doctor we have at the clinic'. [informant to HSU, Malkariyey, December 12, 2019]

Mohamed: 'When our family members get sick, we take them to the sheikhs and Quran is recited on the sick person. We slaughter animals for them, and if the sick do not improve we take or refer them to health clinic'. [informant to HSU, Malkariyey, December 12, 2019]

Figure 4.3. Malkariyey health post; there is no signpost because of security.

Shamsa: 'The overall health of the family is quite fair. Previously, before the rain, there was not much illness. Nowadays there is a new illness called dengue. Two boys of my family are having dengue just now'. [informant to HSU, Malkariyey, December 12, 2019]

Abdi: 'My family members are doing good and they all healthy, but my father Mohamed has common cold. Due to this cold, he has fever and a running nose'. [informant to HSU, Sullale, December 14, 2019]

Mohamed: 'Our first option is to take the sick person to the sheikhs, or the sheikhs will come to the sick at home. Quran will be recited on the sick and hopefully the person shall become healthy'. [informant to HSU, Sullale, December 14, 2019]

Abdulaahi: 'The condition of the family is good. We are eight, and one of my boys is having malaria, with fever, headache and joint pain. We took him to Sullale clinic. They gave him some drugs: he is improving slightly, day by day'. [informant to HSU, Sullale, December 14, 2019]

Nimco: 'We refer our people to clinics when they get sick. And if they become very sick we refer them to Luuq hospital, where there is better treatment and specialist doctors'. [informant to HSU, Sullale, December 14, 2019]

Mohamed: 'As per culture and belief, we refer our sick people to the sheikhs. Quran will be recited at home and mosques according to the needs, but we prefer to read the Quran in our house'. [informant to HSU, Sullale, December 14, 2019]

Suada: 'We are ten. All of us are healthy and no one is sick, thanks to Allah. I have been quite a long time in this place. There is no new disease. Most of the diseases are known by the community'. [informant to HSU, Sullale, December 14, 2019]

Qayrow: 'When our people get sick, we have two ways: we call the sheikhs at our home, they recite Quran on the sick person. And then we take the sick to the health facility, where there is modern treatment'. [informant to HSU, Sullale, December 14, 2019]

Mama Halima: 'The overall health condition of our family is quite good, even though two of my children have fever, and I believe it is both malaria and dengue;[148] but the other children in the family are doing well'. [informant to HSU, Tuulo Amin, December 11]

Mohamed: 'Dengue is more severe than malaria. I believe that dengue originated from town people who had this disease. They came to our villages and stayed for some days; then the mosquitoes bite and the disease spreads to other people in the village'. [informant to HSU, Tuulo Amin, December 11]

Layla: 'Most of the diseases come from town people, especially in overcrowded areas'. [informant to HSU, Tuulo Amin, December 11]

Abdia: 'The father or the household is its head. So the father and secondly the mother will decide when and where to take the sick person'. [informant to HSU, Tuulo Amin, December 11]

Caasho: 'The origin of the diarrhoea in my children is due to lack of hygiene and enough water in all rural villages like this'. [informant to HSU, Tuulo Amin, December 11]

Mohamed: 'The condition of the household members is good. Men, women, youth, children and old people are doing well, but the old man has common cold. We have no traditional healer that gives our sick herbal medicine'. [informant to HSU, Tuulo Amin, December 11]

Ali: 'When our people get sick, we refer them to the health facility. Our sheikh recites Quran, but this does not prevent the sick person to be taken to the clinic'. [informant to HSU, Tuulo Amin, December 11]

Abdi: 'Men, women, youth and children, they are all doing good. In our family we are eight, and two children were sick last week: diarrhoea'. [informant to HSU, Kabasa IDP site, December 16, 2019]

Hassan: 'Recent diseases in our household were diarrhoea and common cold'. [informant to HSU, Kabasa IDP site, December 16, 2019]

Amina: 'The recent disease in the family is common cold, but one of my children had pneumonia (*kolbaariyo*)'. [informant to HSU, Kabasa IDP site, December 16, 2019]

Adan: 'We refer our sick people to Kabasa health and nutrition centre'. [informant to HSU, Kabasa IDP site, December 16, 2019]

[148] According to the stringer, dengue and malaria can affect the same person at one time (it happened to him during OR), because vectors (mosquito species) and typology (parasite and virus) are different.

Abdi: 'In our culture the other option is to depend on Quran and pray for the sick person at his or her house'. [informant to HSU, Kabasa IDP site, December 16, 2019]

Yusuf: 'The health of the entire family is good. No one is severely ill, but we have common cold and dengue'. [informant to HSU, Kabasa IDP site, December 16, 2019]

Jelle: 'Yes, there is a new disease affecting human beings, and it is dengue. People will have all the same signs and symptoms related to malaria, and when we take them to the health facility the health professional tells us: no treatment but paracetamol only'. [informant to HSU, Kabasa IDP site, December 16, 2019]

From the above reported answers it is clear that in *all* locations, modes of enquiry, types of pastoralists and environments, the perception of health, disease and cure is homogeneous and standardized even in wording (although this may be an outcome of the "lost in translation" effect by learned people like the stringer or some spotters). We tried not to utilise questionnaires, but the RO's guidelines were strictly followed by the stringer and, consequently, by the HSUs. Because of that, outcomes were shaped by fixed questioning sequences and uniformed transcriptions.

Respondents were obviously sincere, although we must be careful in analysing their answers: respondents may be complacent. For instance, consider the two most common diseases according the interviewed families, common cold and dengue. Updated at the month of October 2019, the top ten diseases at the Dollow TB and Health Centre were: 1) Acute Respiratory Tract Infections; 2) Pneumonia; 3) Malaria; 4) Urinary Tract infections; 5) Diarrhoea; 6) Sexual transmitted infections; 7) Intestinal parasites; 8) Skin infections; 9) Dengue fever; 10) Tuberculosis.[149] Dengue, the most feared disease according to our informants, ranks only ninth.

An interesting fact is that both among the IDPs of Kabasa and the local population there was no self-indication of "iatrogenic diseases",[150] those generated by wrong practices and treatments by the health personnel. This means that all respondents had a good degree of understanding, trust and satisfaction in the available health personnel, mainly lamenting about costs and lack of drugs and structures.

All in all, the above reported data from local health centres clash with the "reported perception" of diseases by the people living in the PA, clearly stated by our respondents. Anthropologists and biomedics have to answer a crucial question: who is right?

4.2.2 – Animal Health

Having to deal with "pastoralists" by mandate, we paid specific attention to the domain of animal health. We saw above (1.2.1) how people of the PA make use of all possible forms of subsistence economy, but animal rearing is still a priority, at least in their perception. Camels may have partially lost their status, but goats and poultry provide easy protein and are much more manageable in an increasingly dense and barren habitat. Anyway, the words of the "pastoralists" provide some "perceived data" about the health of their livestock.

Stringer: 'In the village I counted 39 cultivated fields, with maize, beans, sorghum, bananas, onions, water melon, tomatoes and lemons. Goats, sheep and poultry were the livestock I managed to observe. The main prioritised problems were: 1) livestock diseases and 2) human diseases. In the village veterinary health post, service was available, with veterinary personnel rendering animal treatment and visiting households every morning to identify the sick animals.[151] The available livestock in the village are mostly

[149] See Annex 1 at the end of the report.

[150] Scott-Smith T, annual lecture of the Oxford Department of International Development (ODID), 2019.

[151] Because of the rapid assessment, we did not manage to have a complete map of the available veterinary services in all the 5 localities; the issue is still under investigation.

goats, sheep and cattle; recently there was enough rain, so no lack of pasture and water, but the main problem is livestock diseases like flu and running nose. In addition to that we visited some houses who had complains and we discovered animals with mouth ulcers: they cannot graze due to the ulcers. Approximately 5,000 goat and sheep, 4,300 cattle, and 1,500 camels are to be found in the village and its vicinity'. [Bantaal, former pastoralists, now river-bank agriculturalists, December 2, 2019]

Spotter: 'We have goats, sheep and cattle. During summer and winter we move with our livestock to the Jiicle area,[152] a distance of 27 km away from here'. [Malkariyey, semi-nomadic pastoralists in a plains area, December 4, 2019]

Spotter: 'Animal health? Goats. Especially goats have contagious caprine pleuropneumonia (CCPP) that we call *hargab*,[153] but there is no new animal disease in our settlement. In any case, there are no veterinary clinics not even in Luuq town'. [Sullale nomadic pastoralist on hilly rangeland, interviewed at the Luuq livestock market, December 8, 2019]

Spotter: 'Our family has goats, sheep, two cattle and one donkey. Goats and sheep have worms. The mange,[154] that we call *cadho*, is due to animals from other locations'. [Tuulo Amin, former pastoralists in urban setting, December 5, 2019]

Stringer: 'The village has no animal health post structure, but they have one community animal health worker who was trained by VSF-Suisse. The vet drugs are provided from Beledxaawo. The CAHW keeps them in his house. When animals get sick or have problems, the pastoralists directly take them to him and he treats them'. [Tuulo Amin, December 5, 2019]

Stringer: 'The household is enclosed with small fence (*boma*), and is made up of wood and thatch made out of a local grass called *gerba*. Animals are kept separated from the hut'. [Tuulo Amin, December 5, 2019]

Spotter: 'Livestock? If you have any animal, their diseases are worms and mange'. [Kabasa, IDP destitute pastoralists, December 3, 2019]

FGD in Malkariyey (5 men, semi-nomadic pastoralists in a plains area, December 4, 2019)

Mohamed: 'The most common disease in our animals, especially cattle, is the abdominal distention gas, flatulence: the animal cannot breathe and dies within few days'.

Mohamed: 'Worms (*gooryaan*) are a common disease in Malkariyey'.

Jamaal: 'There is no traditional methods for treatment, rather than giving anti-worms tablets'.

Husen: 'Agreed'.

Jamaal: 'Let's discuss about mange'.

Husen: 'Traditionally we can apply some plants added with salt: *cadho* disappears and the skin of the animal becomes OK'.

Mohamed: 'We can take the sick animal to the animal health unit and they give us a lotion brought by our vet community health worker'.

Collective complaint: 'We have no animal health post, only vaccination campaign by VSF through local community health workers'.

FGD in Melkariyey (women, who refused photos 'because we fear for our security', December 4, 2019)

Ruqiyo: 'Worms can be transmitted from animals to humans. So we have to keep animals away from our dwelling sites'.

Sahro: 'Some animals come with ticks and this might be unhealthy and infest and bite'.

Naima: 'You are right: ticks bite people and can bring disease from animals to human beings. What we will do is that we take our animals to the vet community worker and spray them some poison: ticks will die, and no more troubles'.

Sahro: 'This for all the animals or the infected ones only?'

Naima: 'No: only the infected animals are to be taken to the animal health worker'.

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[152] *Jiicle* is *Premna resinosa*, a bush whose charred wood is used to give good odour to milk containers; the plant also has medicinal uses and edible fruits; see Leslie AD, *An Introduction to Woody Vegetation of Somalia*, British Forestry Project Somalia, Working Paper 11, Mogadishu; p. 88. As studied by Salza, Somali and other pastoralists use a "vegetal geography", by which identifying grazing areas according to seasons (Acacia flowers indicate incoming rains).

[153] We remind that the same word is used both for humans (common cold) and animals, wherein it is much more dangerous.

[154] A type of skin disease caused by parasitic mites.

FGD in Malkariyey (10 men and 15 women, semi-nomadic pastoralists in a plains area, December 12, 2019)

Mohamed: 'What about the *hargab* (CCPP) affecting our goats?'

Zakaria: 'Not only goats. Even other animals can be affected'.

Adan: 'What shall we do about it?'

Mohamed: 'We will inform the local authority and vaccinate our animals'.

Zakaria: 'The local authorities have drugs or vaccine with them: even their animals are sick too'.

Mohamed: 'We have community animal workers: we can buy the drugs and they will vaccinate'.

Adan: 'Vaccines are not for sale. You will never find them anywhere. Only government or local NGOs give vaccines for free once in a year'.

Zakaria: 'What about other drugs?'

Mohamed: 'No, we cannot buy'.

Adan: 'Let us wait this organization, the ones who are collecting data'.

Zakaria: 'This man here, Abdi, is collecting data, but it takes time'.

Adan: 'I agree. We have to empower our community animal worker and do something'.

FGD in Sullale (nomadic pastoralists in hilly rangelands, December 14, 2019)

Nuh: 'What about animal sickness like *hargab*?'

Mohamed: '*Hargab* is very simple: you just take your animals to the community animal worker and he will treat them'.

Osman: 'What about vaccinations?'

Mohamed: 'Vaccination is good and prevents many diseases, but we do not have vaccines'.

Jelle: 'The animal worker treated my goats with oxytetracycline'.

Mohamed: 'Do you agree with him?' [After a thorough discussion, participants agreed that CCPP can be treated by the animal health worker]

FGD in Bantaal (15 men and 20 women, agro-pastoralists along the river, December 15, 2019)

Ali: 'Worms are becoming very common in our animals, especially cattle and goats'.

Zakaria: 'Worms transmit from animal to animal and from animal to human or from human to animal'.

Mohamed: 'Worms are very difficult to eradicate'.

Qaalid: 'No, I do not agree. We can eradicate worms through proper sanitation in human beings and killing worms by giving anti-worm drugs to our animals'.

Abdi. 'Do worms have some form of vaccination?'

Adan: 'No, worms do not have vaccination'.

Husen: 'Yes, you are right: worms have no vaccination'.

FGD at Kabasa (destitute pastoralists in IDP camp, December 16, 2019)

Adan: 'Our animals have diseases like CCPP'.

Faisal: 'Not only CCPP. Our animals are also suffering from worms during this rainy season'.

Mohamed: 'Which are the signs of CCPP?

Adan: 'Cough, weight loss and poor appetite in all animals, but especially in goats and sheep. I treated my goats from a private animal pharmacy. You too can access to that private animal clinic'.

Nuria: 'The health of the goats is not good because they have a problem like worms, and are not grazing well. It is because of animals coming from other parts of Somalia: they are having different diseases like common cold, worms and many other diseases that we do not know'. [informant to HSU, Bantaal, December 15, 2019]

Ahmed: 'According to our elders, livestock used to get diseases like meningitis (*qoorgooye*), that was affecting camels'. [informant to HSU, Bantaal, December 15, 2019]

Sabdow: 'The health condition of my livestock is good, even though they were not vaccinated for a long time. When we take our animals to the farms there is the tsetse fly that bites the animals, and this might bring a disease to our livestock. Goats have *hargab*: they are coughing all the time, even at night'. [informant to HSU, Bantaal, December 15, 2019]

Siyaad: 'According to our elders there were diseases that used to affect animals, but we have not seen anything like meningitis and anthrax'. [informant to HSU, Bantaal, December 15, 2019]

Ali: 'Recent diseases of the livestock in the family are worms (gooryaan) and hargab that affected our goats and sheep'. [informant to HSU, Bantaal, December 15, 2019]

Mohamed: 'The disease originated from other livestock and possibly from the environment'. [informant to HSU, Bantaal, December 15, 2019]

Ali: 'No new disease was recently detected by the old men and women'. [informant to HSU, Bantaal, December 15, 2019]

Abdia: 'The health of the animals in the family is good, but tsetse fly (*gindi*) is disturbing the animals during grazing; the goats have also worms and *hargab*, because the goats and sheep are coughing'. [informant to HSU, Bantaal, December 15, 2019]

Hassan: 'No new animal disease was recently detected in our livestock'. [informant to HSU, Bantaal, December 15, 2019]

Nuur: 'The health condition of livestock, including camels and donkeys, is good, apart from goats and sheep which are having common cold and worms'. [informant to HSU, Bantaal, December 15, 2019]

Husen: 'The overall condition of livestock is good: the camels produce enough milk, goats are grazing well, but not growing fat. Apart from that, goats are coughing and I think this is common cold'. [informant to HSU, Malkariyey, December 12, 2019]

Abdia: 'There are no new animal diseases currently, but according to old tales the animals used to die of anthrax, *furuq*'. [informant to HSU, Malkariyey, December 12, 2019]

Husen: 'That was long time ago. I cannot tell the exact calendar year, but it happened before 40 to 50 years back'. [informant to HSU, Malkariyey, December 12, 2019]

Hassan: 'Our animals are healthy and currently there is no disease in our livestock'. [informant to HSU, Malkariyey, December 12, 2019]

Caasho: 'Our animals are healthy, but there are other animals that are sick. The origin of their disease might come from alien animals that returned back after the long drought, coming from other areas like Garbaharey'. [informant to HSU, Malkariyey, December 12, 2019]

Hussein: 'We have different types of animals: cattle, sheep, goats, donkeys and camels. All our animals are healthy, but goats are coughing and I hope this is just common cold'. [informant to HSU, Malkariyey, December 12, 2019]

Zakaria: 'I believe the disease of mange originated from Somalia highlands. Compared to other diseases, mange is the most dangerous one: the animals cannot be cured for a long time'. [informant to HSU, Malkariyey, December 12, 2019]

Hussein: 'According to past experience, time ago animals suffered from meningitis, especially camels and goats'. [informant to HSU, Malkariyey, December 12, 2019]

Zamzam: 'The overall condition of our animals is OK and they are doing good. We have cattle, goats, sheep and camels'. [informant to HSU, Sullale, December 14, 2019]

Mohamed: 'Goats are having common cold. Especially goats'. [informant to HSU, Sullale, December 14, 2019]

Nuur: 'The most recent diseases are CCPP and worms'. [informant to HSU, Sullale, December 14, 2019]

Mohamed: 'According to our perception and belief, the origin of these diseases comes from other animals. And CCP might be due to the season'. [informant to HSU, Sullale, December 14, 2019]

Zamzam: 'CCPP is more severe than worms because *hargab* gives strong cough to the animals; they experience difficulties in breathing. According to our experience, animals used to become sick, but no new disease was seen during this recent period'. [informant to HSU, Sullale, December 14, 2019]

Nimco: In our household we have camels, cattle, goats, sheep and donkeys. They are doing good, but the goats are coughing. There are also ticks, especially on cattle'. [informant to HSU, Sullale, December 14, 2019]

Mohamed: 'According to my previous experience, animals used to get meningitis and anthrax, but these diseases were gradually disappearing. People were treating their livestock, and I hope anthrax has disappeared for good'. [informant to HSU, Sullale, December 14, 2019]

Suada: 'Some of the goats have ulcers on their mouth and have difficulty in grazing. Goats have worms too'. [informant to HSU, Sullale, December 14, 2019]

Qayrow: 'I believe the animal diseases are either from other animals that are grazing together with ours, or wild animals having themselves some diseases. Or even the environment: in some areas, animals become sick due to less or absent salts in pastures'. [informant to HSU, Sullale, December 14, 2019]

Mohamed Abdi: ‘We have two camels and both are healthy; we have also few goats and sheep. Sheep have CCPP’. [informant to HSU, Tuulo Amin, December 11, 2019]

Ali: ‘Currently no new disease affected our animals, but a long time ago there were new diseases like anthrax, but now it disappeared’. [informant to HSU, Tuulo Amin, December 11, 2019]

Layla: ‘I rank the disease found in our family’s animals: 1) mange, 2) *hargab*, 3) worms, abdominal gas bloating (*caloolbarar*)’. [informant to HSU, Tuulo Amin, December 11, 2019]

Yusuf: ‘No new animal disease is recent, but before, years back, there was anthrax’. [informant to HSU, Tuulo Amin, December 11, 2019]

Caasho: ‘We have cattle, goats, sheep and donkeys. Donkeys are doing good, but goats and sheep, although grazing well, are not growing fat. I think they have worms’. [informant to HSU, Tuulo Amin, December 11, 2019]

Hassan: ‘Previously animals used to fall down and immediately die; the name of that disease is *qoorgooye*, meningitis. It was three years ago’. [informant to HSU, Tuulo Amin, December 11, 2019]

Shukri: ‘According to our perception, the origin and cause of animal diseases is due to animals migrating from place to place. These transhumance routes are the main cause of disease in livestock’. [informant to HSU, Tuulo Amin, December 11, 2019]

Mohamed: ‘According to what our old men say, the diseases of animals are due to seasonal events, like: ticks infest animals and cause disease in overcrowded animals’. [informant to HSU, Tuulo Amin, December 11, 2019]

Ali: ‘The recent disease of livestock are CCPP and worms; regarding to severity, worms are the most severe compared to other diseases. The diseases that affect our animals originated from other animals that were not treated and vaccinated. They are originated from other areas’. [informant to HSU, Tuulo Amin, December 11, 2019]

Zaynab: ‘Previously, old men narrated us that there were animal diseases, meningitis and anthrax. Those diseases were found in Lower Shebelle, Somalia’. [informant to HSU, Tuulo Amin, December 11, 2019]

Muslima: ‘In our IDP camp we have some goats, about fifteen. And we cultivate a farm along the river, among the cooperatives. The health of our livestock is good, but while grazing the tsetse flies bite the animals and this might bring sickness to the animals. Otherwise we have healthy goats’. [informant to HSU, Kabasa, December 16, 2019]

Abdi: ‘Goats are also having worms and pneumonia’. [informant to HSU, Kabasa, December 16, 2019]

Adan: ‘The livestock? Within the family we have goats, cattle and sheep. Sheep and goats have worms, but cattle and some goats are doing well’. [informant to HSU, Kabasa, December 16, 2019]

Amina: ‘The origin of animal diseases comes from other infected animals. The most severe one is *hargab*’. [informant to HSU, Kabasa, December 16, 2019]

Shamso: ‘No recent disease affected our livestock, that include goats, sheep and chickens’. [informant to HSU, Kabasa, December 16, 2019]

Yusuf: ‘No recent outbreaks happened, neither for people or livestock’. [informant to HSU, Kabasa, December 16, 2019]

Figure 4.4. The Health Post in Kabasa IDP Site

The above monochord discourse about animal health comes from *all* typologies of "opportunistic pastoralists" (see above, 1.2.1 and 1.3) and PA locations. Although surprising, it is conform-copy to a recent report from the same area by VSF-Suisse:[155]

> The livestock body condition was good, following the good rains received during Deyr. The body condition of donkeys and camels was rated as the best, compared to the other livestock species. The livestock diseases/cases that commonly featured were: in Goats (CCPP, Pneumonia, worms and PPR); Cattle (Black quarter, worms, and pneumonia); Donkeys (worms and mange) and in Camels (Trypanosomiasis, worms, Haemorrhagic septicaemia and mange). CAHWs and veterinary team's services were acceptable in the community, even though more households experienced difficulties in affordability of vet drugs due to poverty, low income and high cost. Most pastoralists sourced for veterinary pharmaceuticals from local private vet pharmacies that procured them mainly from Mogadishu and Nairobi.

Two years before, the same INGO reported that the leading diseases/cases in camels were tick infestation, Trypanosomiasis, Wry neck; in cattle, Black quarter, worms and 3 days sickness; in goats, CCPP and worms; in sheep, worms and diseases of unknown aetiology; and in donkeys wounds, unknown diseases, worms.[156]

We can see that, although some diseases remained common (CCPP and worms), others are not in the list after the very good rains of October 2019, above all those utterly 'unknown', or of a menacing 'unknown aetiology'. To complicate the picture, there are discrepancies in the perception of livestock diseases. For example, while common cold (*hargab*) in humans is not considered serious, CCPP (*hargab*, the same word used for both people and animals, but correctly not perceived as a zoonosis, dangerous to people) is to be cured at all costs, vaccines included. Killing livestock diseases, like anthrax and meningitis, are perceived like 'from the old days' and 'eradicated', even if an informant in Tuulo Amin admits that he remembers cases from only 'three years ago'.

Another important point is the fact that animal diseases are mainly believed as "imported" by migrants and improper livestock management during transhumance (overcrowding, mixing, poor control). Here we see the "invasion syndrome", typical of high-density locales (see 1.2.1.).

All in all, we may assume that the uniformity of our informants' answers is not simply due to quick translations or mischievous disguise, but to a perception of incoming "good times", a space-time where only "common cold" and worms (felt like eradicable, though) may interfere with the wellbeing of all households and their livestock.

4.2.3 – Environmental health

Environment and climate change are becoming buzz words in all international agendas, but they are difficultly manageable in the field where, since ages, pastoralists are coping with uncertainty both in climate and environmental resources. Thus, our OR tried to keep some distance from the technicalities of ecology, because pastoralists *are* their environment, as we discussed above. A secondary problem was the insufficient involvement of the stringer (a public health expert) about the environmental issue, something we experienced with biomedic personnel, expatriate and not, during all OH researches in the pastoralist macro-region.

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[155] VSF-Suisse, *LLRP-III Baseline Survey Report, Gedo Region of Southern Somalia, op. cit.*, 2019; p. 2.

[156] VSF-Suisse, *A rapid assessment report of the potential in current drought situation for the different model of destocking in Gedo, Jubaland, Somalia,* Nairobi, February 2017; p. viii.

Having in mind the local perception, instead of getting lists of available plants or vegetation associations and zones, we decided to get information about basic elements of the environmental health: weather, water, sanitation, infesting plants, nutrition values in grasses and trees, pollution and changes in climate and landscape. We kept in our mind that desertscapes like the ones in the northern Gedo Region are alive, themselves in movement, generating movement, and generated by the movement of biotic organisms and abiotic factors.[157] And movement is change, at any moment.

Stringer: 'The weather was so hot that I had to join the community under the "meeting tree", sitting on the ground on mates, to make them feel comfortable. Bantaal is along the river Jubba, but has only one garbage pit for the village waste; it is a dug pit-hole with no fencing; the rubbish from the village is collected and burnt every two to three days; the village has no public latrine'. [former pastoralists, now river-bank agriculturalists, December 02, 2019]

Spotter: 'This soil is loam and sand. Grass and shrubs are the type of plants all around. We have enough grass and bushes for our animals and no overgrazing. Our water comes from a public kiosk directly connected from the river to a water tank; then it is distributed to water points. We fetch water from the main distribution site, at half a kilometre, some 15 to 20 minute walk. Sometimes the water is muddy and sometimes is clean'. [Malkariyey, semi-nomadic pastoralists in a plains area, December 4, 2019)

Figure 4.5. Fenced household on sandy soil, Malkariyey

Spotter: 'Climate problems are related to the natural seasons. You see, Luuq area is among the hottest places, when you consider temperature and climate in our Region'. [Sullale, nomadic pastoralists on hilly rangeland, December 8, 2019]

Stringer: 'I asked the spotter about the environment around his hut. He replied. "There is grass and bush". I checked, and it was bush and grass'. [Tuulo Amin, former pastoralists in an urban setting, December 8, 2019]

Spotter: 'For the water, we have a hand-dug well and a hand pump. [Tuulo Amin, December 8, 2019]

Stringer: 'The surrounding environment had plastic bags around the house and no toilet, no electricity, but the spotter said: "We have cell phones and there is network around"'. [Tuulo Amin, December 8, 2019]

Spotter: There is abnormal growth of a fast-growing tree, *cali garoob*, expanding in the bush. Animals do not eat it and there is no benefit for human consumption. If we promote rangeland management and the plantation of some more important plant, it will be beneficial to our society. Climate? Rain is very

[157] Semplici G, *op cit.*; p. 146; see also Thrift N, "Space", *Theory, Culture & Society*, Vol. 23, issues 2-3, May 2006; pp.139–46.

scarce and the temperature is high in this area, but they are natural phenomena. Here, climate change is due to deforestation'. [Tuulo Amin, December 8, 2019]

Spotter: 'In our camp no bush, or vegetation. And it is sandy'. [Kabasa IDP, December 3, 2019]

Stringer: 'The main water system the camp uses is a pipeline supported by local organization. When I asked about rubbish, the spotter showed me scattered rubbish and plastic bags. "There is no nearby firewood: we have to travel with donkey carts for almost one day", he said'.

FGD in in Tuulo Amin (former pastoralists in urban setting, males, December 5, 2019)

Abdalla: 'Environmental pollution is disposing waste into the open field'.

Qasim: 'Like what?'

Mohamed: 'Like plastic bags, or defecating outside'.

Sahro: 'Water is contaminated by animals. Our well is not protected and water is not good for human consumption. So we need 'water guards' (purifiers).

Ruqiyo: 'The number of latrines is limited. Most of our community defecate outside. This can cause health hazards of disease like diarrhoea'.

FGD in Malkariyey (10 men and 15 women, semi-nomadic pastoralists, December 12, 2019)

Mohamed: 'What is deforestation?'

Ali: 'Deforestation is cutting the trees down'.

Zakaria: 'We have to cut trees because they will re-germinate and grow again, no matter what'.

Ali: 'Cutting live trees will cause negative effects on our environment and weather'.

Zakaria: 'How?'

Adan: 'If we cut trees, the wind directly blows on the land, carrying all topsoil away: the trees will block the wind or slow down the speed of the wind and the soil will be safe'.

Zakaria: 'You are right, I agree with you'.

FGD in Sullale (uncounted men, nomadic pastoralists in hilly rangelands, December 14, 2019)

Mohamed: 'Deforestation is cutting trees from the environment'.

Nuh: 'No matter. We have a lot of trees around: let us benefit from our environment'.

Mohamed: 'If we preserve our environment and keep our trees alive, it is more beneficial than one-time benefit. Our animals eat, we use a tree as a shade right now, and many more benefits. But if you cut, it is not reversible and you benefit only one time and lose a hundred times'.

Mohamed: 'Raise your hands, those who agree to preserve our plants for future use'. [The whole group agreed and the topic was closed].

FGD in Bantaal (15 men and 20 women, river-bank agro-pastoralists, December 15, 2019)

Abdi: 'The only water source we have is the river, but when we go out with our animals for grazing there are no wells or ponds. So this forces us to stay close to the river'.

Mohamed: 'We can preserve water by constructing water ponds through community's efforts'.

Abdi: 'Artificial ponds are very expensive. I believe that digging wells by hand is cheaper and less time-consuming'.

Husen: 'We need additional support'. [they all agreed that the community is ready to dig wells by hand, but they need additional support, like money and food-for-work].

FGD at Kabasa (destitute pastoralists in IDP camp, December 16, 2019)

Abdia: 'What are the major issues of our environment at Kabasa?

Aasho: 'Lack of public latrines in the camp'.

Abdia: 'True. There is no public latrine near the market. People defecate or urinate everywhere, and this can produce bad smell'.

Shamso: 'There are problems everywhere in our camp. People throw used polythene bags, and animals eat this waste and die'.

Abdia: 'Polythene can stay in the soil for a long time and not be destroyed by sun or soil. So it is a real threat to our environment'.

Nuria: 'Important plants are disappearing, like the plants that used to give us wild fruits when we became hungry. The only solution is to have rangeland or protected land in the responsibility of our village, because now it is no man's land'.

Ahmed: 'I agree that those plants were destroyed by men and not women, because we men make money from the plants. On the other hand, weather has changed. Previously the year was having four calendar seasons, two with heavy rain and two dry seasons. Nowadays all seasons are almost near to drought or with little rain'.

Nuria: 'The cause of the environmental problem is due to lack of trees, because the trees used to attract rain and keep our soil stronger against water and wind erosion'. [informant to HSU, Bantaal, December 15, 2019]

Sabdow: 'We live along the river. Our main water problem is that the river shrinks and water becomes too little to be absorbed by the electric pump for the irrigation of our farms'. [informant to HSU, Bantaal, December 15, 2019]

Asho: 'Previously there were wild fruits everywhere along the river. Now the community has extended along the river and cleared all the bush. You will only find farms, no more bush'. [informant to HSU, Bantaal, December 15, 2019]

Mohamed: 'The bush is cleared, and this is manmade, not a natural disaster'. [informant to HSU, Bantaal, December 15, 2019]

Sabdow: 'The weather pattern has changed. Apart from this year, the rainfall was very low and the temperature high, making difficult for us to plant horticultural products'. [informant to HSU, Bantaal, December 15, 2019]

Halima: 'As a family, our perception of environmental problems is that they are due to scarcity of water. The loss of nutritional power in trees is due to manmade problems, because men cut the trees. Soil lost its nutritional power because of an abnormal growth of cereals and other crops'. [informant to HSU, Bantaal, December 15, 2019]

Ali: 'Using artificial fertilizers for the farms and the plantation of trees will be the only solutions to the existing problem'. [informant to HSU, Bantaal, December 15, 2019]

Abdia: 'During the *jilaal* the river will shrink and scarcity of water will rise. So water shortage is due to seasonal alternation'. [informant to HSU, Bantaal, December 15, 2019]

Shuceyb: 'The climate is constant and there is no great change. [informant to HSU, Bantaal, December 15, 2019]

Abdia: 'According to my perception, the cause of environmental problems is due to two reasons: one is manmade and the other is natural disasters, like flood and strong wind'. [informant to HSU, Bantaal, December 15, 2019]

Geesey: 'Scarcity of water is associated with drought season: plants become dry and lose their nutritional value'. [informant to HSU, Bantaal, December 15, 2019]

Ali: 'The origin of environmental problems is due to drought (natural) and cutting of trees from the bush (manmade)'. [informant to HSU, Bantaal, December 15, 2019]

Nuur: 'There is no environmental change I ever noticed starting from my young-hood'. [informant to HSU, Bantaal, December 15, 2019]

Husen: 'Wild fruits are diminishing and it is not like in previous years: people used to depend on wild fruit as source of vitamins and food, but now you will not find those trees any more'. [informant to HSU, Malkariyey, December 12, 2019]

Abdia: 'This year it rained well, but this event comes only once every 10 years. You will see: next seasons there will be with not enough rain. Anyway, the weather is something natural. No one can change the hotness, the coldness. Rain or no rain is out of our power. This is Allah's power, but we can conserve water, plants, grass with the help of Allah'. [informant to HSU, Malkariyey, December 12, 2019]

Mohamed: 'The environmental problem is due to overgrazing: the animals become too many compared to the land. So no more grass and the land will barren. In a short period of time the grass will be finished and people have to look again for where there is pasture and water. The problem is a vicious cycle and we have no solution'. [informant to HSU, Malkariyey, December 12, 2019]

Caasho: 'People have to be taught how to rear animals: quality but not quantity'. [informant to HSU, Malkariyey, December 12, 2019]

Mohamed: ‘The change of weather is due to deforestation and flood. Floods are removing the top-layer of the soil; only rocks are visible in some areas. Previously it was fertile grazing land, but now it is different: no trees and grass’. [informant to HSU, Malkariyey, December 12, 2019]

Abdi: ‘The environment is conducive to wellbeing during the rainy season, but during the dry seasons there is lack of water and grazing. Plants become dry and lose their nutritional value, whereas animals cannot graze’. [informant to HSU, Malkariyey, December 12, 2019]

Duniyo: ‘The rainy season is not enough. Because we are living in lowlands, the temperature is always high, making thus a high evaporation of water, eliciting dry climate conditions’. [informant to HSU, Malkariyey, December 12, 2019]

Amina: ‘Climate related problems are at most manmade-related, like deforestation. The only mitigation measure is to conserve the bush and develop rangeland for the community’. [informant to HSU, Malkariyey, December 12, 2019]

Zakaria: ‘Environmental problems come from manmade activity, like deforestation, overgrazing, use of herbicides on plants: animals eat it and become sick. This includes human beings’. [informant to HSU, Malkariyey, December 12, 2019]

Muslima: ‘Previously, when I was young, I used to look after animals. There were plenty of wild fruits and thick forests, but now the land has become barren. Nowadays you will not get even some shade to rest under it’. [informant to HSU, Malkariyey, December 12, 2019]

Nuh: ‘The change in weather is due to adverse effects of soil erosion and deforestation’. [informant to HSU, Malkariyey, December 12, 2019]

Zakaria: ‘The rainfall is very low compared to other areas. Lack of or not enough rain are the reasons why we always migrate, looking for better pasture and water for our livestock’. [informant to HSU, Malkariyey, December 12, 2019]

Husen: ‘The origin of climate change is due to deforestation: men are cutting the live trees for economical purpose, making charcoal’. [informant to HSU, Malkariyey, December 12, 2019]

Nuh: ‘We need to mobilize our community about the importance of natural resources, including trees. Because trees are important for grazing, shade and even produce wild fruits and natural gums’. [informant to HSU, Malkariyey, December 12, 2019]

Zamzam: ‘Our main environmental problem is flood: it affects the soil top layer, destructs trees and sometimes even washes away a whole family during the rainy season’. [informant to HSU, Sullale, December 2019]

Mohamed: ‘Currently there is enough rainfall, but wild fruits decreased if compared to previous seasons’. [informant to HSU, Sullale, December 2019]

Zamzam: ‘The cause of environmental problems is due to people cutting valuable trees from the area’. [informant to HSU, Sullale, December 2019]

Mohamed: ‘The only solution is to educate the community about the importance of the natural environment. And develop the rangeland because, when there is drought, we migrate with our big livestock, like camels and cattle, while leaving behind goats and sheep for the children and women’. [informant to HSU, Sullale, December 2019]

Nimco: ‘Some years back, we used to look after animals and our lunch depended on wild fruits. But nowadays there are no trees with wild fruits’. [informant to HSU, Sullale, December 2019]

Yasin: ‘The origin of the environmental problem is from man cutting the trees and making them into charcoal’. [informant to HSU, Sullale, December 2019]

Mohamed: ‘Luuq and its area are among the hottest areas in the Gedo Region. Due to this, almost all plants become dry and drop their leaves’. [informant to HSU, Sullale, December 2019]

Mohamed: ‘During the dry season most of the pastoralists move towards the river, where there is water and farming’. [informant to HSU, Sullale, December 2019]

Qayrow: ‘During the dry season grass will remain only in far areas where there is no water. You see, where there is grass there is no water, and where there is water no grass. So we have to move constantly in between grass and water’. [informant to HSU, Sullale, December 2019]

Suada: ‘The origin of environmental problem is due some to manmade mistakes, and some is natural. The manmade is due to the cutting of trees and the natural is due to drought’. [informant to HSU, Sullale, December 2019]

Qayrow: ‘We keep farms along the river. During the dry season we move towards the river and plant crops and vegetables like banana, onion, maize, sorghum. That is because there is not enough milk to drink’. [informant to HSU, Sullale, December 2019]

Mohamed: ‘There is manmade environmental degradation. Some members of the community are cutting the natural trees to make charcoal every day. Previously here was thick bush, but now you will see only open, barren areas’. [informant to HSU, Tuulo Amin, December 11, 2019]

Isniina: ‘There are plants called *caligaroob*. They are thorny trees which easily grow anywhere’. [informant to HSU, Tuulo Amin, December 11, 2019]

Abdi: ‘This plant has a negative impact: no grass or any other vegetation can grow under this tree. The only solution is to eradicate this plant’. [informant to HSU, Tuulo Amin, December 11, 2019]

Yusuf: ‘We live in a lowland area: not enough rain falls, the temperature is too hot whereby the grown grass is quickly destroyed by heat. A second environmental pollution is due to flood and its consequences: the flood drains minerals and topsoil into the river’. [informant to HSU, Tuulo Amin, December 11, 2019]

Isniia: ‘The local adaptation is to plant trees and conserve water from our rivers’. [informant to HSU, Tuulo Amin, December 11, 2019]

Mama Halima: ‘The way is to create job opportunities for the people who are cutting the trees; and mobilization is the only solution to the environmental problem’. [informant to HSU, Tuulo Amin, December 11, 2019]

Ali: ‘There is a change of weather: recurrent drought and following diseases are the major problems in our household as well as in our community’. [informant to HSU, Tuulo Amin, December 11, 2019]

Mohamed: ‘The drought is a natural phenomenon. We do not know the causes, but the mitigation is to preserve water and improve farming methods, like planting fodder grass for our animals’. [informant to HSU, Tuulo Amin, December 11, 2019]

Abdi: ‘When droughts prolong, men travel with the animals looking for pasture and water, leaving behind children and women. During this season the families suffer due to insufficient food and water’. [informant to HSU, Tuulo Amin, December 11, 2019]

Mohamed: ‘The origin of this environmental degradation is due to deforestation’. [informant to HSU, Tuulo Amin, December 11, 2019]

Shukri: ‘Rain events in our village and its vicinity? Throughout the year there is only one heavy rain season. [informant to HSU, Tuulo Amin, December 11, 2019]

Mohamed: ‘The origin of climate-related problems is due to insufficient rain, deforestation and soil erosion. [informant to HSU, Tuulo Amin, December 11, 2019]

Shukri: ‘A local form of adaptation is leaving the plants to grow and not cutting important trees like the acacia and other trees that produce wild fruits’. [informant to HSU, Tuulo Amin, December 11, 2019]

Ali: ‘Trees lost their nutrition value. Fruits become quite less even during the rainy season. To my perception, the solution is to preserve water and avoid deforestation. [informant to HSU, Tuulo Amin, December 11, 2019]

Abdi: ‘The environmental problem in the camp? Plastic rubbish and deforestation by the IDPs. Recently there is some grass here, but no trees’. [informant to HSU, Kabasa, December 16, 2019]

Hassan: ‘The origin of the environmental problem is manmade, like rubbish and the spread of used polythene bags scattered everywhere’. [informant to HSU, Kabasa, December 16, 2019]

Abdi: ‘The temperature is almost always hot and we receive little rain for the whole year. Being agro-pastoralists, when the river shrinks, we dig a well along the river bank for our farm irrigation as the best option’. [informant to HSU, Kabasa, December 16, 2019]

Adan: ‘The environmental problem arises from human beings, especially by their waste. The origin is from the communities themselves who do not care about their environment. They dump waste everywhere’. [informant to HSU, Kabasa, December 16, 2019]

Abdi: 'The rainy season is very short, with not enough rainfall compared to highlands, but no climate change'. [informant to HSU, Kabasa, December 16, 2019]

Amina: 'It is natural both the drought and the rainy season, but we can adapt by caring our environment safe and clean'. [informant to HSU, Kabasa, December 16, 2019]

Jelle: 'The origin of the environmental problem is due to human activity, and the only solution is to promote hygiene and sanitation, and educate the community on the importance of a safe environment'. [informant to HSU, Kabasa, December 16, 2019]

All respondents about the environmental issue seem to minimize climatic change: it is not perceived as a crisis (like it is), but a temporary variation in the season pattern, a weather phenomenon the pastoralists are well acquainted with. Of course, besides previous knowledge about climate uncertainty, religion comes in: not much to do against Allah's will about floods and droughts. This somehow contrasts with the repeated mantra in all locations that 'environmental problems are manmade'; to a finer reading, though, one clearly sees that deforestation is considered different from climatic variations. Agriculturalists are more knowledgeable about soil destruction, while pastoralists are predictably worried by fluctuations in rainfall.

All agree about a certain loss of nutritional power in plants and the disappearance of edible wild fruits, a question absent in all NGOs' agendas; we asked it on purpose: it is a "hidden scope" question, providing a double-blind effect. Catching them by surprise, we managed to zoom out a melancholic "wild-fruit era", present in the memory of pastoralists, men and women.

Global warming is far beyond any control by pastoralists, and not only. In the northern Gedo Region, climate change is perceived differently than in other Greater Horn areas, where the topic appears more media-related than actually perceived by the herders, who use the sentence 'It's all the fault of climate change' like an alien, media-related mantra, outside local knowledge.[158] As we noted before (1.2.1), these people are ready for change, may it come from weather, climate, or whatever wind may blow.

4.3 – THREE Fs

Findings, Failures and Future are the core elements of any research report. We are well aware of the limits of the findings (first F) from the OR in the northern Gedo Region; they may be ascribed to: i) a comparatively small area leading to mixed livelihood types/zones and uniformity in answers; ii) the rapid assessment timeframe; iii) a relatively low pre-knowledge of human terrain and territory; iv) delays in communication (although we managed to keep a rate of 3 to 5 e-mails per day); v) experimental methodology. But the main finding might be the discovery of the continuum urban dweller-farmer-agro-pastoralist-nomadic pastoralist that appeared to be the mosaic-like "way of life" of the inhabitants of the PA.

All these constraints to a statistically valid data-set remain valid and need to be redressed by next operations. The concrete failure (second F), though, is to be ascribed to the inability in *physically* reaching nomadic pastoralists along their transhumance routes, because of security. This hampered a full-screen vison of pastoralism in the project area, blurring all other findings and, possibly distorting even the anthropologic, biomedical (both human and animal), and ecologic analysis. Anyway, as the Mongo people of Congo say: "Who's got diarrhoea must not fear

[158] Salza A, *Cloudless Skies and Whistling Thorns. Global Threats to Pastoralists and Livestock: Environment in One Health Perspective*, report on the environmental-anthropologic research in the frame of the project "Emergency intervention to support drought-affected populations of Filtu and Dekasuftu, Liben Zone", Somali Regional State of Ethiopia, CCM, January 2018; pp. 3-4.

darkness".[159] And we positively jumped into the dark with our methodology in the field and by remote.

We are positive about the outcomes of an "augmented anthropology" research (3.3) that made use of advanced technology (Internet and cell phones) in what is wrongly perceived as a backward socio-ecologic system. We already pointed to the diffusion in the Gedo Region of modern media, that is going to be rapidly enhanced with the diffusion of the 5G network. Since some years, mobile phone companies in Somalia have been providing the cheapest rates for telecommunications services in Africa.[160] According to a study based on a national survey conducted in 2013 by the Broadcasting Board of Governors and Gallup (a company providing 'analytics and advice' to leaders and organizations), 'more than seven in ten Somali (72.4%) say to personally own a mobile phone' (not necessarily a smartphone).[161] Diaspora Somali use this networking to keep alive their association with households and relatives, mirroring the quick-silver model of their pastoralist "ancestors" in seasonal fusion and fission (1.2.1). On the other hand, Somali pastoralists do not interrogate clouds or entrails anymore, but sites with weather forecasting and livestock market previsions.

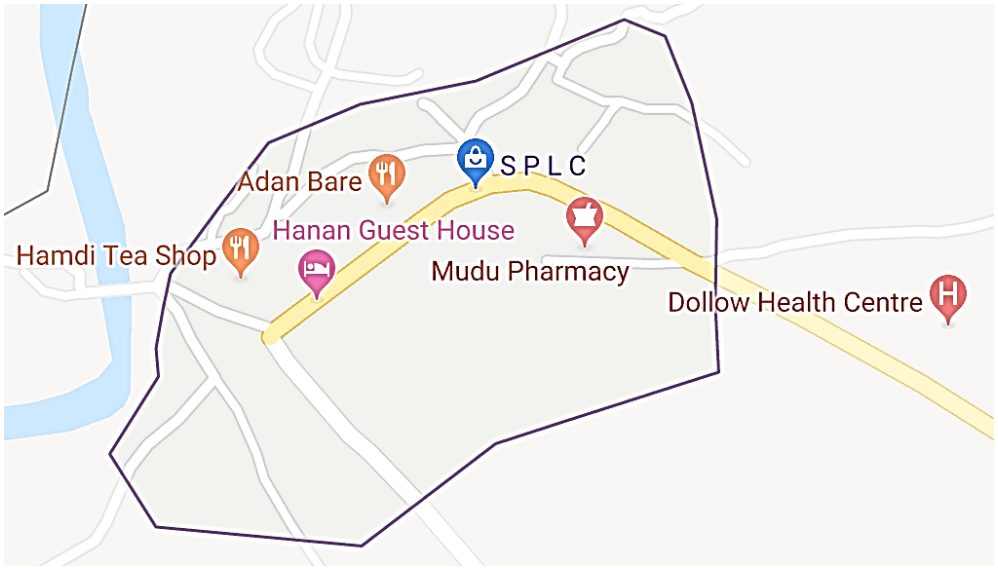
This is the *present*. Field anthropology must enter the *future* (third F), very much so when involved in projects aiming at *change*. Therefore, we provide development decision-makers with a guideline: ameliorate and reiterate researches making use of innovative hi-tech methodologies and tools, saving money and expatriate personnel. If we have to highlight a positive outcome of the northern Gedo Region OR is that, by remote and distance-assisted tutoring, trained local trained personnel may get the empowerment they deserve. Even if they still like camel milk. In the words of Abdimaalik Issack, co-author of this report: 'On my way from Dollow to Luuq, two camel herders milked for me camel milk. I asked them the situation of the area and they said it was good, so I continued my journey'.[162]

Figure 4.6. Camel milk on the road (courtesy of Abdi Issack)

[159] Tessa A and Salza A, *Le radici della saggezza. Proverbi e aforismi africani*, Ananke, Torino 2011; p. 103.
[160] Immigration and Refugee Board of Canada, Somalia: "Prevalence of cell phones and Internet cafes in Mogadishu, including the ability to use cell phones for financial transfers (2012-February 2015)", March 2015, SOM105092.E, available at: https://www.refworld.org/docid/550c35904.html, lastly accessed on December 31, 2019]
[161] *Ibid.*
[162] Field notes about activities in Sullale, December 8, 2019.

ANNEX 1

A visit to Dollow TB and Health Centre, December 2, 2019.
Position: N 40° 09' 46'' – E 42° 04' 56'' – Elevation: 145 m ASL



Map: Dollow Town and Health Centre

It is Monday morning, at 9:25 am. Hot sun, wind direction is about East. We[163] meet Mr Buralle (+252 615219600) at Dollow TB and Health Centre. He is in charge of the TB unit and acts as a medical director during our meeting. Buralle informs us that the centre has different departments: outpatients, antenatal care, emergency unit, outpatient consultation for children under 5, outpatient consultation over 5, pharmacy, maternity for mothers waiting for delivery and those who delivered at the health centre. Besides these units, the health centre provides TB direct observation and therapy/treatment.
Buralle adds that the centre is integrated with supplementary feeding programs, rendering services for pregnant and lactating women (PLW). A mother receives nutritional food, like maize, soya blend, oil and E vegetables[164]. Buralle also promotes delivery at the health centre.

The health centre has visual materials (posters): Community Empowerment and Development Action (CEDA), UNICEF, WFP, Ministry of Health – Jubbaland State. During our visit the health centre was busy and we met the head nurse who was scheduling the daily night-shift. At that particular time of visit, there were 8 nurses, 4 midwives, 2 lab technicians, 1 pharmacist, and 2 health officers.
The health centre is type B standard, with no in-patient unit; in case of complications that cannot be managed – like comprehensive emergency obstetric care and other life-threatening conditions requiring oxygen and further management – patients are referred to the INGO Trócaire.
The Dollow health centre has two main stores. As per our observation, drugs were well arranged, the stock cards were in place. Besides the store, there is one main pharmacy. The daily drug consumption was well documented. During our observation, drugs were given for free and not for sale. The medical director of the centre showed us the water systems in all departments: all were functional. In terms of referral, the health personnel use the local vehicle that belongs to the health centre, but the vehicle is not a standard-equipped ambulance.

[163] The stringer uses the plural throughout, purportedly to show the involvement in the field of the remote operator, like we were one entity/team.
[164] E vegetables are represented by 15 US $ per month sent to mothers who are pregnant and lactating: they have electronic cards (E) to collect cash from the bank and buy the necessary vegetables from shops, supported by WFP. The information was supplied by the stringer after a request by the RO, who did not know about this electronic system. By two e-mails, E vegetables were understood.

The centre was just delivering the service of expanded immunization programs, both to children under five and pregnant and lactating women. 24 children and 11 PLW were in queue, sitting on a bench and waiting for immunization.

We visited the Out-Patient Department. We were held outside until the patient was over. When we entered, the nurse in charge showed us, fixed on the wall, the monthly top ten diseases chart. Updated during the month of October 2019, the top ten diseases were: 1) Acute Respiratory Tract Infections; 2) Pneumonia; 3) Malaria; 4) Urinary Tract infections; 5) Diarrhoea; 6) Sexual transmitted infections; 7) Intestinal parasites; 8) Skin infections; 9) Dengue fever; 10) Tuberculosis.

Ten community health workers refer the pregnant mothers to the health centre for antenatal care and delivery services. They also refer children who are very sick and require medical and nutritional attention from the community. This month [November 2019] they referred 62 mothers who delivered at the health centre and 11 malnourished children to the outpatient therapeutic program.

The health centre counts also on 20 female health workers who refer suspected TB people to the TB unit; then the lab technicians screen the suspected for three consecutive days and, if positive, they start direct observation therapy/tuberculosis treatment. This month they referred 13 cases: 11 were negative and 2 were positive. The health centre also refers the sputum cases to Beletxaawa to confirm for MDR-TB (multi-drug resistant TB). Gene sputum examination from Beledxaawo is then sent back to Dollow health centre, confirming those resistant to therapy and those not resistant to therapy. 'We then start the two-phases regimen (intensive phase and continuation phase)', as reported by Mr Burralle.

The Dollow TB and health centre covers other fifteen villages with mobile health and nutrition[165] (a table, compiled by the stringer, is available at CCM's). In town there is also one veterinary private health post, one private clinic, and one Government health centre.

Bantaal, the choice for our field research, is out of these villages. The total population of the village is 1,560 in a total of 260 households. During our visit the total number of women was 526 and 1,034 men. The chief or the head of the village is Olaad Wardheere.

The data collection was done after oral informed consent (approved by the head of the village). Data were collected smoothly and there were no hindrances or setbacks. The total number of under 5 children was 250; the first household we visited was surrounded by bush savannah; the village is riverine and has vegetation.

Mainly, the community gets their income from agriculture and pastoralism. There are no immigration and sudden internal movements. The population living in the village are native and immigrated from other settlements or some other part of the region.

In the village there is one primary school.

Comments by the RO

These field notes were accurate and detailed. Now, please extend this kind of data gathering to all health posts and centres you meet in your research. We are not health inspectors; build trust and friendship with your informants, do not scare them; so make friend with the personnel and let them state what their problems and proposed solutions are. Remember, what we are researching is the perception of the health system by pastoralists and personnel. So, as I instructed you before, try to give us the "voice" of the people, in their words.

[165] A list of these villages with coordinates is available in the folder ACTIVITIES SPRINGER, file Dollow Health Centre, c/o CCM.