Living With Risk and Uncertainty: The Case of the Nomadic Pastoralists in the Aru Basin, Tibet

By
Marius Warg Næss

Thesis submitted as part of the Cand. Polit degree at the Department of Social Anthropology, Faculty of Social Science
University of Tromsø.
2nd Edition May 2004

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Foreword to the 2nd Edition

This is the 2nd edition of the thesis submitted as part of the Cand. Polit degree at the Department of Social Anthropology, Faculty of Social Science University of Tromsø in 2003. There has been no major revision of the content of the original thesis, but some minor changes have been undertaken for the sake of "textual flow".

Marius Warg Næss

Tromsø, 27.05.2004

Acknowledgments

A long time dream of mine has been to visit Tibet. When I finally decided that I was going to do my master in social anthropology, I thought doing fieldwork in Tibet would be an excellent way for me to combine personal interest with study. However, since I knew that travelling to Tibet, not to say doing fieldwork there, was somewhat difficult, it was of paramount interest for me to study for my honours degree at a university with connection to Tibet or The People's Republic of China (PRC). Luckily, I got in touch with Prof. Per Mathiesen at the Department of Social Anthropology, University of Tromsø, who together with, Dr. Joseph L. Fox, an ecologist at the Department of Biology, University of Tromsø, was about to start a project in Tibet financed by The Network for University cooperation Tibet – Norway, and in cooperation with the Tibet Autonomous Region Forestry Bureau (TARFB). The aim of this project was to investigate the interaction of nomadic populations and wildlife, hopefully providing information as a base for successful management of the Western Chang Tang as a part of a nature preserve established in 1992.

To include an inexperienced student of anthropology in this project seemed to me to be connected with a great deal of risk, but I am ever grateful to Prof. Per Mathiesen who had enough faith in me to send me into the field. For this I thank him with all of my heart: without him my dream would never have been accomplished and this thesis would never have been written. I would also like to thank Dr. Joseph L. Fox for invaluable help both during and after the fieldwork. I would like to thank the Network for University Cooperation Tibet – Norway, based at the University of Oslo, for financial support. I would especially like to thank my good friend Christopher Ladue, who without I might have starved to death upon arrival in Lhasa, and also for helping me with the Wylie transliterations. I would also like to thank Rune Vik-Hansen and Bård Jørgen Bårdsen for proof reading my thesis and giving invaluable comments.

The late Wang Wei Min deserves a great deal of thanks for his help in arranging my stay at the Tibet University. I would also like to thank Mrs. Drolma Yangzom and Mr. Abu at TARFB for their cooperation in this project. I would also like to thank my translators, Ms. Beimathso at the Tibetan Academy of Social Science (TASS) and Dondrup Lhagyal, also with TASS. Their insights and help proved to be invaluable, and for that I am ever grateful.

I also would like to thank my travel companions, especially Mr. Tsering from the Biology Department of Tibet University, and Mr. Migmar Wangdwei from the same department, but also Mr. Xu Binrong from TARFB, Mr. Denda, Mr. Chamba and Mr. Chala from the TARFB Police. I would also like to thank Mrs. Wei Hong and Mr. Sotra at the Foreign Affairs Office at Tibet University for their help in obtaining a travel permit for me, making it possible for me to go out to the Aru basin.

Last, but not the least, I would like to thank the nomads of the Aru basin. They opened up their tents for me, and shared what little of food they had with me. All of you are forever in my mind, and I hope life will be easier for you in the near future. This thesis is dedicated to all of you.

Marius Warg Næss

Tromsø, 06.06.2003

Note on Transliteration

Tibetan

Tibetan words are transliterated according to the Wylie (1959) system of transliteration in the text. Wylie transliterations are written in italic and are only given the first time a word is mentioned. However, some words are not known in its correct Tibetan form, and appear then in phonetic transliteration only. When words appear in both phonetic transliteration and in the Wylie form in the text, the Wylie form is written in brackets and italic.

Chinese

Chinese words are mainly written in the official pinyin system in use in The People's Republic of China (PRC) today. However, words such as place names are given in their most common form, regardless of the proper pinyin form.

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Part One: Introduction and Theoretical Perspectives

Chapter One: Introduction

1.1 Focus of Thesis

This study is the first of its kind, i.e. no anthropological study has ever been done in the Aru basin of northwest Tibet. As such, it is important to describe the nomadic pastoralists in this place, and how they make a living. In other words, this thesis is concerned with what 'nomadic pastoralism' in the Aru basin is. On the other hand, as the title of the thesis suggests, this thesis also deals with phenomena called risk and uncertainty. However, the two areas cannot be viewed separately because, as I will argue, 'risk' and 'uncertainty', plays an integrated part in being a nomadic pastoralist in the Aru basin.

1.1a Nomadic Pastoralism: Towards a Working Definition

According to Dyson-Hudson (1972), the traditional anthropological study of nomadic pastoralism was concerned with typologies of "pure pastoralists or nomads", in which the units of analysis were not societies but "ideal types". Pastoral and nomadic societies were classified according to how much of the "ideal types" they contained. However, the modern study of nomadic pastoralists has shown there is no such thing as "pure pastoralists or nomads", instead there are variations (Dyson-Hudson, 1972). According to Barth (1966) it is important to look for processes that produce social forms by seeing a society as patterns of human behaviour or patterns of allocation of time and resources instead of looking at morphologies or typologies. For Dyson-Hudson (1980), nomadic pastoralism constitutes a social form that may be defined as the coexistence of dependence on livestock with spatial mobility.

Khazanov (1994:16) gives five characteristics for nomadic pastoralism:

> "(1) Pastoralism is the predominant form of economic activity. (2) Its extensive character connected with the maintenance of herds all year round on a system of free-range grazing without stables. (3) Periodic mobility in accordance with the demands of pastoral economy within the boundaries of specific grazing territories (as opposed to migrations). (4) The participation in pastoral mobility of all or the majority of the population (as opposed, for example, to the management of herds on distant pastures by specialist herdsmen, into which only a minority is involved in pastoral migrations). (5) The orientation of production towards the requirements of subsistence (as opposed to the capitalistic ranch or dairy farming of today)."

As this definition implies, nomadic pastoralism is a distinct form of *food-producing economy*, distinguishing it from other forms of economic activity, where mobile pastoralism is the dominant activity, and where the majority of the population undertakes seasonal movements. There are many examples of societies being nomadic, but not pastoral, and pastoral societies that are not nomadic. Also, since it involves everyone in the various aspects of production, it distinguishes nomadic pastoralists from shepherds in Western Europe or the American cowboys who also make a living by herding animals. As Barfield (1993:5) states: "*Heidi* is not the story of a Swiss nomad girl even though she herded cows and goats each summer."

According to Spooner (1973:3) the term "nomadism" has been applied to any society that is not settled in permanent dwellings, although etymologically it implies a pastoral subsistence base. According to Seymour-Smith (1986) the word '*nomad'* is derived from the Greek word *nemo*, which roughly means, "to pasture". Although the word 'nomad' refers both to mobility and to a pastoral base of subsistence, in the following I will distinguish between nomadism[1] as referring to *mobility*, and pastoralism as a *mode of subsistence*. The term mobility has to comprise both seasonal and daily movement along with who participates in the actual moving, making it possible to conceptually distinguish nomadic pastoralism from *transhumance*. According to Jones (1996) transhumance refers to an economic system that is based on both agriculture and livestock herding, with a permanent "home base" occupied by all members during most of the year. Herding of

[1] However, Humphrey & Sneath (1999:16) argues that the category nomadism is useless analytically, and prefers the term 'mobile pastoralism', since "Mobility here is seen as a technique that is applicable in a range of institutions, rather than as a holistic lifestyle suggested by the word 'nomad'." However, my usage of the term 'nomad' here refers exactly to the aspect of mobility, as ways of moving spatially, i.e. as a strategy used in *a way of making a living*, and *not to a value orientation* (see Salzman & Galaty, 1990 for further discussion on the difference).

livestock and agricultural activities are divided between the members of a household so that not all of the members are involved in the pastoral production. A household is here defined, following Dahl (1979:70), as

> "[…] the smallest group of people which can take independent decisions over the allocation of its members' domestic and herding labour, and over the use, allocation, and location of their livestock capital."

According to Dyson-Hudson & Dyson-Hudson (1980:18), discussing movement patterns of nomadic pastoralists and their livestock with reference to categories like transhumance and *semi-sedentary*. has "[…] proved to be an intellectual sterile enterprise." Movement patterns are empirically constituted and have to be investigated and not discussed in relation to a firm typology. For example, one of the main reasons given for why pastoralists in Africa move is the seasonality of pastures, i.e. different pastures have different growing seasons and the nomads move accordingly (Dyson-Hudson & Dyson-Hudson, 1980). However, movement doesn't necessarily have to be explained only in terms of exploitation of grazing areas:

> "The use of livestock as a major resource gives the human population dependent on herds the option of moving to avoid a wide range of hazards in the physical and social environment, an option not generally available to agricultural people who are tied to their agricultural lands and their stored agricultural products." (Dyson-Hudson & Dyson-Hudson, 1980:17).

Pastoralists fall into the category of food-producing economies, since they rely on domesticated animals that are controlled by the pastoralist:

> "Thus, the sex and age composition of a herd is, ideally, an artifice of the pastoralists, who, at the same time, allocates different 'tasks' to his animals" (Paine, 1994:15).

Pastoralists exert control over their animals based on their preferences for livestock's products they make a living of either directly, or indirectly, through the usage of products from the domesticated animals (Spooner, 1973). Directly in the form of meat, blood, milk, hair, wool and hides, usually referred to as primary pastoral products. Secondarily, (but

nonetheless direct) pastoral products are butter, cheese, cloth and carpets. Indirect use of pastoral products refers to subsistence via a market economy in modern times, or by trading or bartering in the traditional times.

Although pastoralism refers to a subsistence based on livestock, what kind of livestock they rear and what kind of pastoral products they make use of, varies across cultures. Nevertheless, nomadic pastoralists have to be differentiated from nomadic hunters-gatherers, which economy can be classified as a *food-extracting economy*, i.e. hunter-gatherers do not physically change the animals they live of, as nomadic pastoralist do through selective breeding (domesticated animals tend to give more milk and more wool than their wild counterparts because of breeding) (Khazanov, 1994). Nevertheless, not all anthropologists agree in separating nomadic pastoralists from nomadic hunter-gatherers based on these criteria, for example Ingold (1986) prefers to classify both nomadic pastoralists and hunter-gatherers in terms of mobility and resource appropriation, and does not distinguish them on the basis of food-extraction and food-production. Ingold (1980) distinguishes between nomads and hunters on the basis of their relationship to the animals they subsist on. Whereas the relationship between a hunter and animals is that of a predator-prey relationship, the relationship between a pastoralist and his herd is that of a protector-protected. Ingold (1980.) also divides them on the basis of access to land and animals, where for a pastoralist access to land is normally common and access to animals divided, access to both land and animals are common for hunters.

As seen, there are differences in how researchers define nomadic pastoralism. However, what constitutes a nomadic pastoral adaptation in one society cannot be described and compared with a basic "ideal type", but has to be investigated empirically in order to be properly understood. As Spooner (1973:3) writes "[…] there are no features of culture or social organization that are common to all nomads or even that are found exclusively among nomads." As a consequence, this thesis is aimed at giving an empirical description of what nomadic pastoralism in the Aru basin, in the northwestern parts of Tibet is.

1.1b The Pastoral Production System: Living with Risk and Uncertainty

The overreaching perspective of this thesis is to conceptualise nomadic pastoralism as a *system*, and then focusing on the *production system*.

> "Simply stated, the systems approach provides a systematic approach to treating groups of interacting, interdependent parts linked by exchanges of matter, energy, and information." (Moran, 2000:11)

By describing any given nomadic pastoralist way of production as a *system* we imply some kind of *modelling* of that system. Models are by nature mere abstractions, or in other words: analytical. They try to illuminate certain aspects, or processes, in the empirical world. Some things are left out, or taken in to account because of their relevance to the explanations that are sought. According to Moran (2000:10) this is so because "The complexity and multiplicity of factors that impinge on human adjustment to environment are such that to deal with them, we must simplify the overall situation." As a consequence "A model simplifies reality and is created by speculating on what processes might be involved in producing the observed facts." (Moran, 2000:10). Models are confronted with the problem of defining its boundaries. This is according to Moran (2000:11) up to the researcher and such decisions are usually based on "[…] an issue or problem that is to be the object of investigation."

System theory is useful heuristically in the study of nomadic pastoralism, since it gives us the opportunity to conceptually designate any pastoral society as an overall system. However, within a system there are also *subsystems*. According to Flannery (1972), a subsystem displays two opposing features, namely that of *segregation* and that of *centralisation*. These features are defined according to "[…] the degree of control higher-level decisionmaking bodies maintain over lower-level bodies." (Fratkin *et al*., 1994:5). However, according to Fratkin *et al*. (1994) they are more easily understood if one views subsystems as individually identifiable, i.e. segregated, but also interdependent, i.e. centralized. For example, easily identifiable subsystem within a pastoral system would be livestock production, the organisation of labour, mobility etc. (Fratkin *et al*., 1994.). Accordingly,

> "Identification of these subsystems – i.e., *segregation* – is a prerequisite to understanding the larger system within which they are nested. Yet, […], real understanding arises from examination of the interaction between variables – in this view, systems – represented by *centralization*." (Fratkin *et al*., 1994:5)

As such, *the production system* of the Aru nomads can be conceptualised as a *subsystem* within the *pastoral system*, or within the *total system*, i.e. the Aru basin and all of its composites, whether ecological or social.

However, systems theory is a perspective on the modelling of relations that "[…] can only account for specific outcomes through reference to other theory – maximization, technoenvironmental determinism, learning theory, or the like." (Rodin *et al*., 1978:749). Keeping that understanding in mind, my view within system theory is to look at actors within a specific production system, and how they make decisions within their total system with reference to the framework of *risk*. In other words, while system theory might be viewed as a *meta-theory* that can only model certain phenomena and their relationships in the world, the *explanation* of the phenomena has to come with recourse to another theory, in this case that of risk.

This thesis will focus on four separate themes, or systems, and how they interact with the pastoral production system, namely (1) the *pastoral production system* and the *ecological environment,* (2) *the organisation of labour*, (3) *mobility* and (4) *macro-political and macro economic decisions*.

This thesis will (1) analyse the interaction between the *pastoral production system* and the *ecological environment* with recourse to ideas concerning *risk*. Risk is defined as an unpredictable variation in ecological or economic variables and as the probability of loss or hazards in any given context (Cashdan, 1990). The pastoral production system in Aru is confronted with problems such as constant fluctuation in climatic parameters e.g. snow. Snow can fall at any time of the year, and sometimes blizzards also occur. This can have a detrimental effect on livestock and people, since it is not uncommon to lose large parts of or even entire herds in the course of one night's blizzard. As such the ecological environment can be viewed as being unpredictable and as increasing the risk of loosing animals, i.e. increasing the probability of loss. Consequently, conditions for life within this basin can be said to be unpredictable, since there is no way of telling when and where the next blizzard will strike. Food production in the basin is therefore a risky enterprise. Consequently, the Aru nomads rely on strategies to reduce production risk. Two strategies will be dealt with here, namely (1) subsistence diversification, in this case hunting, and (2)

species diversification, i.e. the keeping of yaks (Tibetan: *g.yak*), sheep (Tibetan: *lug*) and goats (Tibetan: *ra*).

Another subsystem and its relation to risk that will be discussed, is (2) *the organisation of labour*. Göbel (1997) argues that bottlenecks in the availability of the work force, has to be considered as a risk factor in pastoral production systems, since the number of people in a household both plays part in the optimal care and control of the herd, and the optimal use of the animals. Bottlenecks in the availability of labour can be connected to Stenning's (1958) term: 'family development'. The number of personnel (consumers and producers) in a pastoral nomadic household will change throughout a household's lifetime, i.e. the term refers to cyclical changes in the size and composition of viable domestic units. The formation of *herding groups* will be central since it can be viewed as a strategy for countering bottlenecks in the availability of the work force. By this I make the distinction between *households* and *herding groups* since they can be discussed in relation to the differentiation Robert Paine (1964) has made between the terms *herding* and *husbandry*. Paine (1964:79) defines herding as: "[…] the herd/pasture relationship as directed to the welfare of the animals" (ideally speaking relentless of the herders welfare), while husbandry on the other side, relates to "[…] the herd as the harvestable resource of its owners" (Paine, 1964:79). Herding is about having control over the herd in the terrain, making sure that it gets adequate nourishment, protection from predators etc. Husbandry for Paine (1964:79) is "[…] the efforts of the owners in connection with the growth of capital and the formation of profit". Allocation of capital is something that the individual household have the full responsibilities for, and do not have to discuss with members in the herding group.

Paine (1972 & 1994) operates with the concept of *commensurability*, which refers to the commensurate proportions of herd management. These commensurate proportions are: *herds*, *personnel* and *pasture*[2], or the three factors of pastoral production. These factors are commensurate in the understanding that changes in one affect at least one of the other the. Accordingly, the Aru nomads should move and settle according to a system that takes into account the heterogeneity of their grazing area, i.e. movement patterns have to take

[2] However, as Paine (1972:78, footnote 1) writes: "Access to water as well as pasture, must probably be included as a prerequisite of herd management outside the northern regions." However, as with the northern regions, water doesn't seem to be a critical resource in the Aru basin.

advantage of the spatial and temporal structure of resource distribution in the total available grazing area. If an area cannot sustain the number of animals grazing on the area, incommensurability between pasture and herds will be the result, and possibly have detrimental effects on animals' welfare, i.e. *the risk* of losing animals will increase. As such, (3) *mobility* can be viewed as a risk strategy aimed at attaining commensurate proportions between *animal numbers* and *pasture*.

System are usually conceptualised as *closed* or *open*. A closed system is a system that is conceptualised as being independent of outside forces. An open system on the other hand is conceptualised as being part of a larger whole, i.e. there is always interaction between a system and forces outside of the system. Moran (2000:11) writes: "Whereas a closed system is maintained by internal cycling of materials, an open system requires constant inputs from outside the system to maintain it." For example, Khazanov (1994) argues that there is almost no pastoral systems that rely exclusively on livestock products for their own consumption, instead pastoral systems has and still are to a larger or lesser degree dependent on products produced *outside* of their system. Pastoralists in Tibet have for example always been dependent on trading with farmers to obtain grain since as Goldstein & Beall (1989:630) writes" […] roughly 50% of the annual calories of these pastoralists [Phala] derive from barley and other grains, trade for grain has always been an integral component of their subsistence economy."

Although the total system in the Aru basin can be conceptualised as closed, i.e. independent of outside forces, I will view it as an *open system* since the production system in the Aru basin is influenced by (4) macro-political and macro-economic decisions taken outside of the Aru basin. Three examples will be discussed, namely (1) the increasing importance cashmere wool production, (2) the ban on hunting as a result of declining wildlife populations, and (3) change in movement patterns due to a change in land tenure policies.

1.2 Chapter Preview

This thesis is separated into 3 different parts: an introductory part that gives a brief introduction to the aim of this thesis deals along with the theoretical underpinnings of the

thesis. The second part is an ethnographic introduction to Tibet in general and specifically the Aru basin. Finally, the third part deals with how the Aru nomads *make a living*.

Part One: Introduction and Theoretical Perspective

Chapter One presents the focus of the thesis and also discusses briefly how different anthropologists have conceptualised *nomadic pastoralism*. I will also discuss methodological challenges, such as the limited timeframe for the field study, the locality of the study area, the use of translator, and also in what way information was collected.

Chapter Two presents an overview of some theoretical perspectives concerning the study of nomadic pastoralism. A short historical introduction with regard to the theoretical developments in nomadic studies will be briefly presented, along with the main theoretical perspective in this thesis, viz. that of *risk analysis*.

Part Two: An Introduction to the Field of Study

Chapter Three deals with the ethnographic background of this study area and gives a brief introduction to the history of nomadic pastoralism in Tibet, from its origin to the present day.

Chapter Four will discuss the distribution of people and animals living in and using the Aru basin along with a general description of the patterns of social organisation in the Aru basin.

Part Three: Living With Risk and Uncertainty

Chapter Five describes the pastoral production system in the Aru basin, i.e. how the nomadic pastoralists in this area make a living.

Chapter Six will describe some of the unpredictable, unforeseeable and problematic ecological phenomena facing nomadic pastoralists in the area, like (1) snow related phenomena, e.g. blizzards, (2) the presence of poisonous grass, (3) predators, (4) the possible degradation of the grassland. In other words this chapter describes the constraints and risks the pastoral production system in the Aru basin has to work within.

Chapter Seven describes two different diversification principles, namely that of subsistence diversification, in this case hunting, and species diversification, i.e. the underlying principles for keeping yak, sheep and goats in the Aru basin.

Chapter Eight describes how units of herding form and break up in accordance with the demand for labour. Any given household's need for labour changes both seasonally and

throughout its life cycle. The underlying assumption is that the formation of herding groups is related to bottlenecks in the availability of labour.

Chapter Nine discusses movement and settlement patterns, and deals with how the nomads move seasonally as a response to taking the advantage of the best possible gazing areas during every season. In other words, this chapter will deal with how seasonal mobility can be viewed as a risk response.

Chapter Ten will describe how macro-political and macro-economic decisions influence the production system in the Aru basin. Three examples will be discussed, namely (1) the increasing importance of cashmere wool, (2) the ban on hunting and (3) changes in movement patterns and mobility from the pre-Chinese era and up till the present.

Chapter eleven will be a summary chapter and is meant to give the reader an overview over the main points and arguments in this thesis without going into empirical details.

1.3 Doing Fieldwork

1.4 Qualitative and Quantitative Methods

Method has to do with how we gain information about any given phenomenon. In social science it is common to distinguish between *qualitative* and *quantitative* methods. Qualitative methods aim at accessing meaning, social interactions etc, i.e. it is method for *understanding* social phenomena. Quantitative methods on the other hand are designed to investigate measurable phenomena, and distribution of any particular phenomenon. In other words qualitative methods are concerned with the quality of a phenomenon rather than the distribution (Fossåskaret *et al*., 1997). Nevertheless, as Fossåskaret *et al*. (1997.) points out, the different approaches are not at odds with each other, rather they contribute with different types of knowledge and. it is common for researchers to use both methods.

1.5 Participant Observation

Wadel (1991:9) writes:

> "To put it simply, fieldwork implies that researchers stay among the people they want to study in their natural environments. One tries to observe directly the interaction that takes place between people, and the researchers tries to participate as much as possible in this interaction [My translation from Norwegian]."

By participant observation we mean that the researchers try to become like one of the actors they study. As such the researcher is both a *participant* and an *observer* (Fossåskaret *et al*., 1997). By actually being situated in the field, the researcher achieves a form of participation.

However, being a proper 'participant observer' requires that one stay in the same place for a longer period of time, so that you are recognized as if you were one of the people. This was never an option for me; my time in the field was split up into three different periods for external reasons. My first visit to the Aru basin was in June 2000 (two weeks), the second time was in September/October the same year (five weeks), and finally in May/June 2001 (five weeks), the individual periods being relatively short. Ideally I should have stayed longer and I had preferred to stay in the basin continuously instead of splitting the study up. Unfortunately, this was not for me to decide, but was decided by our partner in Tibet, The Tibet Autonomous Region Forestry Bureau (TARFB). They did not want us to stay in the field more than a month at the time, due to the area's remoteness. The possibility of serious illness or accidents without means of getting to a hospital or doctor in time, made them unwilling to provide travel permits extending one and a half month. However, I spend a total of ten months in Tibet, and then mainly at the Tibet University in Lhasa, and as such gained more knowledge about Tibet and her inhabitants than just from being in the Aru basin

1.5a Locality and Timeframe

My study area, the Aru basin, is located in the northwest part of Tibet Autonomous Region (TAR). The closest town, or centre, is around one or two days drive away. From Lhasa, the capital of TAR, it takes from 5 to 12 days to drive, depending on road conditions. During summer, roads are wet and cars get stuck regularly. The basins remoteness also implied several logistical problems. As no food or equipment could be bought in the area (except some meat from local nomads), we had to bring all our necessities with us. The need for gasoline became a significant constraint on my movement. The danger of running out of gasoline made the drivers desist from driving, except when absolutely necessary. This was strongly felt during our last fieldtrip in 2001, when I couldn't visit all of the nomads in the basin I had wanted to. The nomads in the basin are located at a distance from each other, making driving to each camp necessary. As a consequence I had to spend most of my time

with one group of nomads, and data from other nomadic groupings are therefore scarce, although contact had been established during previous visits.

However, the shortness of my stays also influenced the type of information I could access, numbers of animals, tents, people etc. was both open for observation and the nomads willingly shared it with me. However, qualitative information, regarding the nomads 'culture', i.e. cosmological and value systems and the like, were much harder to get access to. Consequently, the timeframe within which the study was done structured/directed the information I was able to get hold of, more towards the 'nomads' way of living', i.e. economic patterns and processes, than towards the 'the nomads' way of life'.

1.5b Information Gathering

Because of long distances between the settlements, I was never able to stay at the same place for a long enough period of time to fully participate in their daily routines. Activities like milking were never opened for me, since milking is the responsibility of women. However, I participated sometimes in the daily herding of the animals, and was amazed at the Aru nomads' stamina. Herding sheep and goats is not a question of just bringing the animals to a patch of grass and let them stay. It requires continuous movement to follow the herd, which moves along while it browses. This is usually done from sunrise to sunset, at an altitude of 5,000 m above sea level. Although not always participating, I tried to be present at every aspect of their life that was open for me, such as meals, shearing of wool, slaughtering, herd splitting etc. During this time there was always a chance to talk and discuss, and most of my information was gathered through informally interviewing different members of the households. Of course, due to the timeframe I spent more time with some households than others, but all households that use the basin were interviewed at least once during one of the three fieldtrips.

1.5c 'Status'

Also, our close connection with the Forestry Bureau gave me a somewhat ambiguous 'status' among the nomads. The technical leaders and guides that accompanied us in the field were official representatives from this department. The nomads recognized them as police officers, because they had previously arrested some of them for illegal hunting. Therefore I was at times also ascribed the 'status' as a governmental official and the nomads assumed that all the information we collected from them would be handed over to

the government. This caused some fear, and I was often met, when investigating livestock numbers, with statements like: “please, don’t tell the government that all these animals are mine, I am herding them for my brother”. Also, a national law introduced prohibition on hunting in the early 90’s, and the fact that we were taken to be policemen also led to difficulties in establishing their hunting habits, which always was referred to as “something we did in the past, but we have stopped now”. At the same time, the fact that we were foreigners also led the nomads to link us to aid, and probably made them purposefully exaggerate the harshness of their situation. However, I was also met with statements such as “Why do you ask these questions? You know us so well now, you understand this without asking!” One nomad actually approached me, asking my opinion, since I was “an expert with regards to their life”, whether she should sell all of her animals and buy a shop in the closest town, since “life as a nomad was too hard”. Also, when we were supposed to leave the basin at the end of my final fieldtrip, one nomad deplored that we had to leave, and that it would be empty when we left. As such, I managed to establish a connection close to friendship with some of the nomads, and weren’t so much looked upon as an ‘outsider’, but more as a ‘friend of the nomads’. This was mostly so because they felt that my interest in their life was genuine. Interactions with the nomads were also eased by the fact that I always brought medicine or other sought after gifts.

1.5d The Use of Translators

Although I had learned to speak some Tibetan at the Tibet University, my command of the language was not good enough to do fieldwork without the aid of a translator. For an anthropologist, translators are not the preferred way of communicating with people since communication between people speaking the same language is always interpreted on the basis of personal views, feelings etc. To add to the possible confusion, a translator is a further filter through which communication has to be established. My native language is Norwegian; my translators’ native languages were Tibetan and Chinese. The only way we could communicate was by speaking English, a secondary language to all parties. Also, there is a difference between dialects in Tibet, and all of my translators were from the eastern and central parts of TAR, and they had sometimes difficulties understanding the Aru nomads. Also, as Berreman (1962) has shown, the use of translator can affect what kind of information you can get access to. The translator’s position opposite the informants’ can to a large degree structure the quality and information you get. As for me, I experienced to have both a female and male translators. However, all of my translators

were born in nomadic areas of Tibet, and as such had tremendous insights into to nomadism in Tibet and were more helpful than hinder.

These methodological challenges notwithstanding, this study is the first of its kind in this area, and as such gives a description of a group of people of which previously very little was known.

Chapter Two: Theoretical Approaches to the Study of Nomadic Pastoralism

2.1 "The East African Cattle Complex"

Herskovits (1926) showed how cattle were a dominant element among east African pastoralists' culture and life. Cattle were important in many ways, as a symbol of wealth, dowry, in ceremonies etc. As such, their preoccupation with having large herds was explained to have nothing to do with economic considerations, but rather with values lying outside the economic domain. This has been defined as the "East African cattle complex", where focus was put on the social value of cattle, often without reference to the consumption requirements of households (Dahl & Hjort, 1976:1).

As a consequence nomadic pastoralists have been viewed as non-rational, since they have been accused of having an economically unreasonable attachment to their livestock. Professionals and governments viewed problems, such as dramatic droughts causing the death of animals and humans, pasture degradation in many pastoral areas as inherent in the nomadic pastoral adaptation itself. As Galaty & Salzman (1981:6) puts it:

> " Their [the pastoralist themselves] retention of pastoral economic structures based upon the maximal increase of herd size, under new conditions of limited movement and growing dessication because of rainfall failure, were seen to have led to overgrazing of pastures, environmental degradation, and the physical decline of livestock. Eventual economic collapse and famine were thus seen to follow the logic of the 'tragedy of commons', the inevitable outcome of lack of individual restraint on livestock production in the face of collectively owned pasture resources (Ferguson 1979; Konczacki 1978)."

As a consequence, proponents for this view stressed the importance of changing the economic base of nomadic pastoralists, primarily through technological innovation and more effective production.

2.2 Towards a Generative Model of Nomadic Pastoralism

Before 1960, few anthropologists studied pastoralism. According to Fratkin & Smith (1994) the study of the *pastoral production system* in anthropology first started out with E. E. Evans-Pritchard (1940). Evans-Pritchard described the many aspects of pastoral production, such as milk production, organisation of labour etc, in great detail. As such, Evans-Pritchard paved the way for the study of pastoralism in Africa that focused on the:

> "[…] unique fit between livestock-keeping peoples and the arid lands they inhabit, between their particular social organizations and the demands of mobile livestock production." (Fratkin *et al*.,1994: 1)

This is clearly a move away from the "East African Cattle Complex", where focus was placed on the prestigious aspects of having large herds, instead of the economical and ecological considerations underlying it. Accordingly,

> "Such a preoccupation with the cosmological aspect of cattle easily leads to a misunderstanding of the rationale for an individual household keeping many cattle." (Dahl & Hjort, 1976:1)

According to Dyson-Hudson (1972:8) the modern study of nomadic pastoralists has focused on being:

> "[…] behavioural or realist, because it arises from the necessity to record data which comes as unclassified, continuous stream of happenings, whose patterns can only be discerned by missing as little as possible. It is permanently concerned with specificities – of time, place, number, frequency, duration, identity, intent, option and so on. Its characteristic form is the analytic description of variables in a system, whereby general patterns are indicated through describing and inter-connecting particular instances."

This line of thought is concerned with empirical details, and has revealed a great variety in social organization and environmental adaptations experienced by different pastoral societies (Fratkin *et al*., 1994). Also, this perspective states that to understand herders, one

must understand herding (Dyson-Hudson, 1972). Consequently, there is no unifying description of pastoralism there are instead variations.

One proponent of this view, of both being preoccupied with great empirical detail and at the same time being occupied with general patterns of human behaviours, is the Norwegian anthropologist Fredrik Barth. He viewed the process of social life as a strategic game in which there are possibilities for moves and counter-moves, as well as certain rules that regulate the possible outcomes. How successful an individual is, depends both on the moves he makes, and on the moves other players makes. According to Barth (1967:4)

> "The determinants of the form must be of a variety of kinds. On the one hand, what persons wish to achieve, the multifarious ends which they are pursuing, will channel their behaviour. On the other hand, technical and ecological restrictions doom some kinds of behaviour and rewards other; while the presence of others imposes strategic constraints and opportunities which modify the allocation people can make, and will benefit from making. I will therefore argue that it is unfruitful to explain social form, a pattern, directly by hypothesizing a purpose for it. Individual actors and individual management units have purposes and make allocations accordingly; but a social form, in the sense of an over-all pattern of statistical behaviour, is an aggregate pattern through which ecologic and strategic constraints channelize, defeat and reward various activities on the part of such management units."

The environment here incorporates both the ecological surroundings and other human actors. An analysis of nomadic pastoralism has to try to understand the *determinants* (i.e. *constraints* and *possibilities*) of the specific social form, since this makes it possible to see how changes in the determinants generate change in the form. This line of thought has been known as '*generative'*, since it focuses on social processes that *generate* certain *patterns of human behaviour*, or *social forms*.

Applied on studies of nomadic pastoralism, this perspective shows that nomadic pastoralists are rational under certain sets of constraints. Several authors (e.g. Barth, 1961 & 1973; Haaland, 1977) have shown that under conditions of communally owned pastures and individually owned livestock, as is the case in the Aru basin, the most rational strategy for individual pastoralists is to maximize livestock numbers. The argument, briefly stated, is based on the particular nature of the main production factor in a pastoral system, i.e. *animals*. Consequently, livestock can be viewed as *capital,* defined as: "[…] a resource in

respect of which one controls its reproductive value". (Paine, 1971:158) Because animals produce other animals, the main product from livestock production is capital gains, i.e. the main part of the income from the herd is, or can be, reinvested into the system, unless the owner removes productive animals through sale or slaughter. The system grows more or less automatically, as long as the herd owner can avoid consuming his herd. Under communal land tenure there seems to be no limits, except those imposed by labour requirements, to the number of animals a herd owner can accumulate. Communal wealth, access to pasture, is in this way transformed into private productive capital, namely animals.

Also, Barth (1964) argues that there are certain aspects of the fact that animal are capital for nomadic pastoralists, which have fundamental consequences for their economic and social organisation. Through consumption and capital growth there will be either a lower or upper threshold of "shedding" from the household in the nomadic adaptation. The lower threshold is that balancing point where the poor family has consumed so much of its capital, that the herd is no longer capable of reproducing itself to the extent that it can cover the household's needs, i.e. minimum subsistence requirements for any given household. The upper threshold is that balancing point where the rich family finds it more productive to invest the capital profit in other "adaptations" and therefore will leave the nomadic way of life, i.e. it will cost too much with regard to labour to keep too large a herd. Because of dangers connected with the lower threshold, it is of paramount interest for nomadic pastoralist to maximise herd growth, i.e. they will do their best to increase their herds (Bates & Skogseid, 1997).

In this perspective, problems facing nomadic pastoralists are seen as being caused by outside forces, such as national and international forces of change that have disregarded the underlying principles of the nomadic pastoral adaptation:

> "While their own production systems were viewed as sound, since they were based on principles of internally-regulated-semi-arid-land animal husbandry, their plight was thought to have resulted primarily from the inopportune coincidence of relatively severe but not entirely unprecedented drought and a decade of confiscation and appropriation of pasture lands by expending horticulturalists and commercial ranchers. Rural-based subsistence pastoralism was further weakened by the spread of commercial relations and international

> market forces, which stimulated the overexploitation of pastures through production for export and the market." (Galaty & Salzman 1981:6-7)

Nomadism in this sense is not viewed as non-rational, but rather as a rational adaptation under marginal conditions. As a consequence, development programs have to take into account the specific production system of nomadic pastoralism, i.e. before e.g. development programmes are implemented extensive research has to be undertaken to get a clear understanding of a specific pastoral system and under which conditions it operates.

2.3 Nomadic Pastoralists as Risk Avoiders

McCabe (1997:55) writes that pastoral management strategies are best understood as rigged towards risk aversion rather than strategies that emphasise maximisation. This view is presented by Galaty & Johnson (1990:20-21) as:

> "The essential pastoral strategy is probably neither maximisation nor optimisation but risk aversion, an attempt to decrease uncertainty by anticipation. Domestic security is increased through creating alliances across ecological zones, distributing livestock among friends, securing rights in dry season pastures, increasing herds in anticipation of future losses. Short term tactics include punctuated movements to take advantage of new grass, depriving humans of milk to feed calves, or keeping animals within the home to increase security."

In other words, pastoralists "have evolved strategies…that aim instead to absorb risk through adaptive management." (White, 1997:90) In this view, pastoral strategies are not viewed so much as directed towards maximising animal numbers, but rather *directed primarily towards securing a predictable food supply in a highly unpredictable environment*. However, according to my own interpretation of Barth's framework (above), maximisation is exactly such a strategy: living in an unpredictable environment necessitates a focus on maximising herd size for herdsmen so that the potential of falling below the 'lower threshold' is minimized.

According to Roe *et al.*[3] (1998), nomadic pastoralists are not so much concerned with trying to avoid falling below a minimum subsistence level, as they are with maintaining peak herd size at all time so as to provide them with a reliable source of food. Also, they argue that there are two models of pastoralism found in literature. One focuses on *risk aversion* strategies of herders, ecological adaptation and the need for herd mobility in an unpredictable environment. The other model is based on *dis-equilibrium theories* developed for a better understanding of the ecological dynamics of rangelands. In contrast to the first model the second model views pastoralism as *high reliability institutions*, which is "the search and attainment of reliable peak performance through utilizing and managing highly complex technologies." (Roe *et al*., 1998:1)

According to Roe *et al*. (1998) conceiving unpredictability as risk, and pastoralists as risk averters make sense if rangeland unpredictability is the core outside factor affecting pastoralist decision-making. However, Roe *et al* (1998:1) argue:

> "[…] that the central concern of pastoralist is to manage a predictably unpredictable environment better, so as to establish a "reliable" flow of life-sustaining goods and services from rangeland ecosystems that are in fact an endogenous part of their production system."

The important difference here is that regarding the first perspective, avoiding hazards is the central issue for pastoralists, while the other stresses that pastoralists actually accept hazards and that the aim is to manage them better. Risk-averting pastoralists then attempt to avoid or escape the high hazards of ecological unpredictability, since they cannot control the probability of the occurrence of hazards. Reliability seeking pastoralists on the other hand are actively engaging in ongoing efforts to reduce the probability they cannot avoid by

> "[…] managing temporal and spatial diversity in grazing opportunities and diversity in livestock capabilities and response. Rather than being risk avers in trying to avoid hazards altogether, pastoralists accept and even take risks in order to respond to high-consequence hazards they cannot altogether avoid." (Roe *et al.,* 1998:2)

[3] It seems that two versions of Roe *et al*. (1998) exists, one that is published and one that is available on the Internet. Quotes are based on the Internet version since they do not appear in the published version. However, both sources are given in the reference list.

Nevertheless, the difference between these two models seems to be exaggerated, in fact it looks like Roe *et al.* (1998.) criticise some researchers for believing that nomadic pastoralists actually try to completely avoid risk. Now, this is a rather naïve belief, which I do not think that neither nomadic pastoralists nor researchers keep. No strategy said to be risk avoiding can be interpreted as a strategy aimed at *completely avoiding risk*, i.e. making risk absent. Both researchers and nomadic pastoralists fully understand that there are certain risks involved in being nomadic pastoralists that are outside of their control. My interpretation is that the term *risk avoidance*, refers to strategies that are aimed at (1) *reducing the possibility of exposing oneself for risk, i.e. reducing the probability of hazards*, and (2) *reducing the impact of a hazard when it occurs*.

2.3a Risk and Uncertainty: A Definition

According to Cashdan (1990) there is little consensus on how *risk* and *uncertainty* should be defined. *Uncertainty*, in a very broad sense of the word refers to an individual's lack of knowledge about the state of the world. However, uncertainty is usually divided into two aspects:

> "An individual facing a future of several possible states may be uncertain about which one will actually occur, but he may be able to assign probabilities to each of them." (Cashdan, 1990:2)

If the individual is able to do so, the situation is described as "risky", while if probabilities are impossible to ascribe, the situation is described as "uncertain". Although this distinction has been somewhat ignored by turning problems of uncertainty into problems of risk by using subjective probabilities, Cancian (1980) has argued that the distinction should be maintained since the behaviour of people faced with known risk (e.g. variable rainfall) and the behaviour of people faced with uncertainty (e.g. new technology) is very different. However, this distinction is of meagre relevance to this thesis, and uncertainty will be used in the broadest sense.

Risk, following Cashdan (1990:2-3), is also defined into two aspects. Firstly, risk can be defined as an

> "[…] unpredictable variation in some ecological or economic variable (for example, variation in rainfall, hunting returns, prices, etc.), and an outcome is viewed as riskier if it has a greater variance."

Secondly, risk can be conceptualised as "the probability of loss or hazard." (Cashdan, 1990:3), and is most appropriate if one is concerned with the probability of falling below some minimum level of income or food intake. On the other hand, the difference between these two definitions is somewhat unclear. It is possible to argue that in the Aru basin, unpredictable variations in ecological conditions (e.g. snow), lead to increased probabilities of falling below a minimum subsistence level.

It is common to distinguish between *risks* and *constraints*, although the conceptual border between them is blurred. *Constraints* can be viewed as a set of more general limiting conditions for economic behaviour of pastoralists. A basic economic constraint is the relatively fixed biological cycles of their means of production, i.e. their animals, which are hard to change in any given circumstance. *Risks* on the other hand can be natural phenomena such as droughts, epidemics, or as in the case of the Aru basin, blizzards. As Bollig & Göbel (1997:8) writes:

> "The implications of these biological limitations of the pastoral means of production become more intelligible if analyzed in the context of concrete risks such as droughts and epidemics. One major implication is the long recuperation phase of livestock in case of partial or total loss. While farmers can gain a good harvest from his field after the previous harvest has been disastrous due to a drought, a herder in the same situation has to wait several years until he can again achieve an average level of productivity. […] Indeed, a great delay in recuperation after important drought-induced losses seem to be one of the main problems of pastoral production."

The same applies for epidemics, and they are usually enhanced because veterinary services have a hard time reaching mobile herders because of the marginality of most pastoral areas and because pastoralists usually have limited capital (Bollig & Göbel, 1997:9). These biologically determined long recuperation phases have certain economic and social consequences. Bollig & Göbel (1997:9) writes:

> ”First, it must be pointed out that a minimum number of individuals is required to guarantee herd reproduction and the smooth operation of a pastoral household economy. If a herd falls below a certain limit (minimal herd unit), household members can no longer subsist on pastoral activities alone. There will not be sufficient animals and animal products (milk, wool, etc.) either for household consumption or for economic exchange, especially for obtaining agricultural products. As we have seen, heavy losses of reproductive potential even up to a collapse of the entire herd are hardly reversible in the short run even if the herder invests a maximum of work into his dwindling herd. Therefore, sustainable restocking frequently entails many years of labour beyond the pastoral context.”

However, the biological cycle of animals is not the only constraint on the pastoral production system. Everywhere pastoralists have to make a living within an environment. The environment both puts constraints on what is possible to do, e.g. the amount of grass limits the number of animals and people, and certain environmental factors, such as blizzards, pose risks since they can affect the number of animals. As such, while it is easy to classify biological cycles as constraints, the environment can be viewed as both constraining and bringing about risks, making the distinction blurred.

2.3b The Environment

According to Halstead & O’Shea (1989) the world that humans inhabit is in a constant flux, and all humans are faced with changes in both their natural surroundings and in the behaviour of other humans. Human beings have to deal with a diversity of natural and social environments, in which they live and that to some extent constrain human behaviour. What is of special relevance in this study is what particular ecological constraints the pastoral system of the Aru basin interacts with, since the *ecological environment* on the Tibetan Plateau in general is quite harsh and heavy livestock losses are often experienced as a result of heavy snowfalls and severe cold weather (Cincotta *et al*., 1991; Goldstein *et al*. 1990; Miller, 1998; Miller, 2000; Schaller, 1998).

As a consequence it is important to elaborate what exactly is meant by *ecology*. According to Moran (2000:58),

> “Ecological study, in its broadest sense, applies to the dynamic relation between living and nonliving parts of an ecological system.”

Accordingly "The research strategy of ecological anthropology is to study a wide range of human responses to environmental problems, to social constraints, and to past solutions to environmental problems." (Moran, 2000:58) Little & Morren (1976:5) put it this way: "We are concerned with those cultural and biological responses, factors, processes and cycles that affect or are directly connected with the survival, reproduction, development, longevity or spatial positions of people."

By focusing on the ecosystem concept we have a conceptual framework to study human adaptability, whether physiological, cultural or behavioural (Moran, 2000). An ecosystem is defined as "all the organisms in a given area, interacting with the physical environment, so that a flow of energy leads to a clearly defined trophic structure, biotic diversity and material cycles." (Odum, 1971:8). As such the ecosystem term incorporates both the pastoral production system and the environment as parts of the same system. Consequently, when I describe the interaction between the pastoral production system and the ecological environment, it can be conceptualised as a closed system, i.e. an ecosystem. As such the production system can be viewed as a subsystem within the total "Aru" ecosystem.

2.3c Variability and Unpredictability

Risks connected with production and then especially related to its *variability* and *predictability* (or reliability) is highly relevant. The concept of 'limiting factor' is widely used to reduce complex ecological problems since, even though organisms must cope with a multiplicity of environmental problems, their survival is usually limited in any given context by just one or two critical resources (Halstead & O'Shea, 1989). Food can be said to be a critical resource, since it is both needed regularly, and yet can be both irregular in availability and unstable once acquired. According to Halstead & O'Shea (1989:3) variability may be conceptualised in two different ways:

> "[…] as the actual pattern of variation in food supply, or as the operation of those factors, ranging from climate to micro-organisms to human judgment, that influence the availability of a particular food resource. Regardless of the focus, the crucial aspect of the analysis is the timing, frequency and severity of shortages."

Any source of variability will exhibit three characteristics, namely temporal structure, spatial structure and relative intensity:

> "By temporal structure, we refer both to the timescale over which a given risk operates (i.e. how often it occurs). Spatial structure relates to the size of the affected area. A consideration of spatial structure also concerns the relative homogeneity of effect within an area, that is, the degree to which scarcity is evenly (or patchily) spread over the landscape… Finally, intensity refers to the severity of shortages and to the degree of variation in severity that can occur. A particular cause of crop failure may be consistent or variable in the severity of its effects. Intensity may, therefore, be seen as having both a temporal and spatial component." (Halstead & O'Shea, 1989:3)

On the other hand, variability can also be classified in terms of its relative predictability. Sources of variation that are predictable may represent seasonal or annual phenomena, or they may be cyclical over long time. The effects are therefore repeatedly felt at regular intervals:

> "Indeed, within a given environment, a society's ability to cope successfully with such regular and predictable kinds of variations may be viewed as the minimum necessary conditions for survival and, as such, integral to normal existence." (Halstead & O'Shea, 1989:3)

Unpredictable variations may result from common factors such as climate, isolated and sporadic occurrences, such as some forms of pest infestations, or may be cyclical on a timescale too long to be recognized. This form of variability is more difficult to buffer for the reasons that no one ever knows when the buffering mechanisms will be called into play.

Individual hazards are often unpredictable, in terms of their precise timing and from the perspective of a potential victim, and "this element of uncertainty significantly exacerbates the risk from perturbations." (op.cit., 1989:1).

Although the basic structure of this variability, namely its frequency, duration, spatial scale, severity and regularity, can often by predicted quite accurately by scientists, actors within the system usually do not have access to the same kind of information. Therefore life within such a system can be viewed as highly unpredictable.

Göbel (1997:41) writes:

> "Pastoral households have to deal with a set of problems, that can be characterized in an abstract manner with recourse to the framework of risk analysis. The main problems are (a) production risk, (b) bottlenecks in the availability of the work force, (c) market insecurities, (d) macro-political and macro-economic risk. These problems can have different repercussion on individual households. Their impact depends on structural characteristics of a household, the size and composition of its herds and pasture grounds and its access to income alternatives."

Göbel (1997:41) writes that in a pastoral context production risk "refers to marked unpredictability in the number and quality of animals and animal products", i.e. it refers to the problem of how to secure a reliable flow of food. This risk, in the Chang Tang Plateau is related to unforeseeable variations in the climatic and ecological conditions. In the Aru basin, frequent, and unpredictable blizzards influence, both health conditions of animals, man and herd reproductivity. For example, even though Tibetan herders have a long-term experience in assessing when blizzards are most likely to occur, they are obviously not capable of predicting the actual occurrence and the scale of it, something that again influence their production system.

Also, the availability of labour is of major importance for the Aru nomads. The number of people in a household both plays a part in the optimal care and control of the herd, and also the optimal exploitation of the animals, i.e. production and consumption. However, any given household experiences changes in the workforce throughout its cycle of life, i.e. starting with the establishment of a new household, and ending when all children having left their natal household (Stenning, 1958). Also, any household's demand for labour is seasonal, with the milking season as the most demanding. Milking is a time consuming activity, and the more time spent milking, the less time animals spend grazing, which again

influence the amount and quality of milk. A large workforce is therefore preferable at this time.

The Aru nomads are relying on a cash income from sale of wool and especially cashmere wool. The prices fluctuate on a yearly basis, making the nomads level of income increase or decrease dramatically every year. Cashmere prices are dependent on both international and national markets outside of the Aru nomads' control, and as such their economy is influenced by these macro-economic structures.

2.3d Cultural Responses To Variability

According to Halstead & O'Shea (1989) societies generally employ a wide range of strategies, called 'buffering mechanisms', to counteract scarcities. These strategies are designed to lessen the impact of variability by softening its effects. These strategies can include everything from myths to alternative modes of subsistence. Their usefulness depends on the social and environmental context, including both the structural characteristics of the society at large and the structure of resource failure the society is likely to experience. According to Bollig & Göbel (1997), the logic of risk reducing strategies is to minimize the impacts of risks and to reduce uncertainties. Strategies for countering unpredictability and variability can be grouped into four basic categories, namely (a) diversification, (b) exchange, (c) mobility and (d) physical storage.

(a) Diversification includes a broad range of both passive and active practices, the underlying principle being that broadening the base of subsistence system, either by using a wider range of plant and animal species or by exploiting broader and more varied areas (i.e. niches), reduces the risk of catastrophic shortages.
(b) The concepts of sharing and reciprocity, i.e. exchange are virtually universally accepted as social values. As a strategy for buffering scarcity, exchange functions in similar fashion as storage, i.e. present abundance is converted, this time through social transactions, into a future obligation if needed, i.e. I help you now, if you help me later (Halstead & O'Shea, 1989).
(c) Mobility works by taking advantage of the spatial and temporal structure of resource failure in effect to move away from scarcity towards abundance. Movement because of droughts in Africa is a good example; both hunter-

gatherers and pastoralists use this strategy to move away from areas that are much affected to areas that are less affected.

(d) Physical storage refers to strategies that are directed towards stabilizing available food so that it may be consumed at some later stage. This principally is a means of dealing with temporal structures of food availability.

> "All four categories of buffering mechanism exploit favourable aspects of the temporal and spatial structure of variability to mitigate the risk of scarcity. Mobility and diversification use local abundance to counter local scarcity, while storage balances seasons of plenty against lean seasons and good year against bad. Exchange secures a stable food supply by playing off temporal variability. As a result, different types of responses are suited to buffering different sorts of risk. (Halstead & O'Shea, 1989:4)

Although, I will mainly use Halstead & O'Shea's four strategies in this thesis, this is not the only way researchers have classified risk minimising strategies. Colson (1979:21) gives us five strategies that are commonly used for countering possible disasters: (1) diversification, (2) food storage, (3) storage and transmission of information of famine foods, (4) conversion of surplus food into storable valuables which can be traded during crisis and (5) engaging in social relationships enabling individuals to get access to food resources in other regions.

Halstead & O'Sheas' four categories are basically buffering mechanism for what Göbel (1997:41) calls "production risks", although the boundaries between production risk, bottlenecks in the availability of the work force, market insecurities and macro-political and macro-economic risk are somewhat fluid. For example, mobility can be used both as a strategy for countering local scarcity of for example grass, and as a means of avoiding macro-political and macro-economic risks. For example, nomadic pastoralists have often avoided taxation by governments by being mobile and thereby managed to stay below "the radar" of governments. Also, by diversifying the subsistence base, consequences of macro-political implementations on local level can be reduced. None of these strategies are means of countering risks related to bottlenecks in the availability of labour, since both mobility and diversification presuppose a relatively large, or at least stable, workforce. Both mobility and subsistence diversification would be impossible if enough labour was not available. However, we can broaden the definition of exchange to include the exchange

and sharing of *labour,* something, as we will see, can work as a means of countering individual households' lack of labour in some situations. On the other hand, d) storage can be in conflict with e.g. mobility, i.e. any successful storage of food requires limited mobility. Consequently, storage will not be dealt with here.

2.3e Levels of Risk Response

> "[…] most societies deploy an array of different strategies in a hierarchy of responses, which are equated with both the scale of the producing and consuming units (individuals, households, villages, states) and with the magnitude of the resource failure encountered. In this sense, societies are faced with a trade-off between security, as reflected in the ability to withstand increasingly severe and rare fluctuations, and efficiency in terms of normal subsistence activities and of avoiding investment in precautions that will only rarely be used." (Halstead & O'Shea, 1989:4)

We can therefore distinguish between the scale of both shortages and risk responses. General resource failure may need risk responses that transcends the local level, maybe an entire population needs to be mobilized. For example, famines as often seen in Africa often entail global aid. Also, during the harsh winter of 1997-98 money was collected in Lhasa to give to poverty-stricken households in the nomadic districts of Naqu. We can therefore distinguish between *low-level* and *high-level mechanisms*. Low-level strategies are the most efficient and most reliable, but they are only of limited use. High-level strategies are more powerful, in terms of the scale of shortage that they can buffer. Forbes (1989) distinguishes between *first defence mechanisms* and *safety net, emergency and catastrophic mechanisms*. The first one he designates as *lower-level hazard response mechanisms*, and the latter as *higher-level hazard response mechanisms*. Lower-level response mechanisms are energetically intensive and socially acceptable, such as diversification of economic activities. Higher-level response mechanisms on the other hand can be said to require low energetic inputs and are often socially unacceptable, such as begging. On the other hand, Forbes (1989) also points to the cost of risk management. For example, while herd splitting can be said to have obvious advantages in the face of droughts it clearly entails labour costs. Also, although herd diversification enables a more thorough exploitation of resources, it needs a wider set of resources and is also labour demanding. However, this study will mainly deal with low-level mechanisms of risk

reducing strategies, since at present no high-level mechanisms seem to be available in the Aru basin.

Part Two: An Introduction to the Field of Study

Chapter Three: Ethnographic Background

3.1 Introduction

This chapter is aimed at giving the reader an introduction to the history of the Tibetan Plateau and the nomadic pastoralists that inhabit this vast area, starting with the origin of nomadic pastoralism in Tibet and ending with the present situation. Since no anthropological study has been done in the Aru basin previously, some of my historical and empirical material is based on research done in other parts of Tibet under the assumption that similar circumstances were present in the Aru basin as well. A short presentation of these sources is therefore necessary. My primary source, is the work of the American anthropologists, Dr. Melvyn Goldstein and Dr. Cynthia Beall. They were the first researchers who were given the opportunity to do long term fieldwork in Tibet after the People's Republic of China (PCR) took control of Tibet in 1959. They did extensive fieldwork with nomadic pastoralist in the southwest part of Tibet, more specific in the Phala[4] area, a part of the Shigatse Prefecture. They did a total of 16 months of fieldwork in Tibet, spending 10 months with one nomadic community from June 1986 and June 1988, describing how the nomadic pastoralist make a living at high altitude and under changing political conditions (Goldstein & Beall, 1990).

Before this, we have to go as far back as 1926 to find an anthropological account of the nomadic pastoralists in Tibet, namely that of the missionary/anthropologist Robert B. Ekvall who did extensive fieldwork in the eastern parts of Tibet in 1929-27, 1929-1935 and 1939-41. Ekvall's material will also be used in this thesis (Ekvall, 1968). Although no anthropologists have been to the Aru basin before, Dr. George B. Schaller, the famous wildlife ecologist visited the Aru basin on several occasions in the early 1990s doing wildlife surveys. Although his focus was primarily on the wildlife populations in the basin, he also writes about the nomadic pastoralist in this area and these accounts are the only

[4] Goldstein & Beall use both Phala and Pala to designate the same area, but for simplicity I will only use Phala.

written sources concerning the Aru basin and nomadic pastoralists (Schaller, 1998; Schaller & Gu, 1994).

3.2 The Origins of Nomadic Pastoralism in Tibet

The Tibetan Nomads, or *Drokba* (*'brog pa*) which is the Tibetan name for nomads, inhabit what today is called the Chang Tang Plateau, meaning "the Northern Plateau". It is the name of a large area located in the north and central parts of Tibet, reaching from Indian Ladakh in the west to the Chinese province of Qinghai in the east. It contains about 69 percent of Tibet's landmass, and is the home of millions of livestock and about 25 percent of The Tibetan Autonomous Region's (TAR) total population of nearly two million people (Goldstein & Beall, 1990).

Nomadic pastoralism originated about 9,000 years ago in the mountains of southwest Asia, today known as Iraq and Northwest Iran (Goldstein & Beall, 1990; Miller, 1998). The first animals to be domesticated were goats and sheep, and nomadic pastoralists soon spread into Central Asia. It is not known when nomadic pastoralism first emerged in Tibet, although it is doubtful that any large-scale nomadic pastoralism was possible before the domestication of the wild yak (*Bos grunniens)* (Tibetan: *'brong*) (Ekvall, 1968; Goldstein & Beall, 1990; Miller, 1998). There has been few archaeological excavations undertaken in Tibet, and therefore little evidence is available to shed light on when and how yak domestication started (Olsen, 1990). Chinese scholars claim that yak husbandry is around 4,000 years old. On the other hand, there are reasons to believe that long before the first nomads entered the Tibetan Plateau, there were nomadic hunters present, as witnessed by stone artefacts found that are possibly 20,000 to 30,000 years old (Brantingham *et al*., 2001). Although, the domestication of yaks was the main factor that enabled nomads to make a living on the Tibetan Plateau, animals such as sheep goats and horses were probably brought into Tibet from the west by Central Asian nomads moving into the area (Miller, 1998).

The Tibetan nomadic pastoralists formed the base of establishing Tibetan empires of considerable size in the Tibetan rangelands. For example, during the reign of the Tibetan king, Songsten Gampo (602-650 AD), the Tibetan empire became a major force in Central Asia. Their capital was in the Tsangpo Valley in Central Tibet, and from there Tsongsten Gampo gathered disparate nomadic groups and brought them

under his control, consolidating an empire that would last for a long time. In 763, Tibetan troops captured and even briefly held the Chinese Tang dynasty capital at Chang- an (modern day Xian), and by the end of the 8th century, Tibetan territory included large parts of central Asia (Miller, 1998).

The base for this vast military power was the rangelands and the nomadic pastoralist inhabiting them. The pastoral production system provided them with riches such as fibres, wool, yak, butter and horses in large amounts. Horses provided them with a means for military organization that could travel fast and conquer territories far away.

3.3 The Tibetan Plateau

The Tibetan plateau in the western part of the People's Republic of China (PRC) encompasses a large rangeland area where nomadic pastoralism is still practised. The area reaches around 1,500 km from North to South, and around 3,000 km from East till West, and the actual plateau is around 2,5 million square km. It is the biggest and highest plateau in the world. Over 80 percent of the land area is above 3,000 m in elevation, and about half is over 4,500 m. This is undoubtedly one of the harshest pastoral areas in the world still in use by nomadic pastoralists. Some nomads actually have permanent camps as high as 5,100 a.s.l. During winter, temperatures around minus 30 C are not unusual and blizzards are common even in summer. Annual precipitation varies from about 700 mm in the east to less than 100 mm in the west. Most of this falls in the summer, and then as snow and hail (Miller 1998:25).

> "Grazing land on the Tibetan plateau are divided by rugged mountain ranges, deep river valleys, and large lake basins that give rise to tremendous diversity in topography, climate, and rangeland types. The rangelands are diverse in structure and composition, varying from cold deserts to semi-arid steppe, and shrub lands to lush alpine meadows. They display a diverse assortment of plant communities, wildlife species, and various, distinct nomad groups and nomadic pastoral production practices" (Miller 1998: 25).

An estimated 12 million yaks and 30 million sheep and goats inhabit the wide pastures of the Tibetan Plateau (Clarke, 1987).

3.4 A Historical Survey of Modern Tibet and Tibetan Nomadism

3.4a Tibet Under Chinese Rule

The relationship between PRC and Tibet has always been ambiguous. Barfield (1993:194) writes:

> "The close relationship between the Ch'ing emperors and the Dalai Lamas was at once religious and political. While China did not administer Tibet directly, it did have considerably influence there; and while Tibet saw itself as autonomous, the country had not developed an independent presence in the world community. With the establishment of the People's Republic of China in 1949, the communist regime claimed legal sovereignty over Tibet as an autonomous region but recognized the Dalai Lama as its legitimate ruler. The odd combination of an atheistic Marxist government in Peking working with a Buddhist clergy in Lhasa lasted only ten years."

In 1950 the People's Liberation Army (PLA) embarked upon what has been termed the 'Liberation' of Tibet from imperialistic and feudal influences. They quickly succeeded in making the Tibetan government to accept a '17 Point Agreement for the Peaceful Liberation of Tibet'. This agreement left the old politico-economic system intact, in exchange for Tibet's acknowledgement of Chinese sovereignty over Tibet. This agreement was more or less intact until 1959, when the Dalai Lama, fearing that the autonomy guarantied in the 17 Point Agreement would not be kept by the Chinese, fled into exile in India. From then on, PRC assumed direct and complete control, and the old political system in Tibet came to an end. Monasteries no longer controlled land and all their wealth was confiscated. Political control fell into the hands of secular official appointed by the Chinese (Goldstein & Beall, 1990; Barfield, 1993).

The full power of this transformation wasn't to be felt in the Aru basin and the nearby areas until the end 1959 and the beginning of 1960, when the PLA arrived there. According to some of the old nomads in Aru, the arrival of the PLA went relatively peaceful. In fact, some nomads actively helped the PLA by giving them road directions etc. Some of the local Tibetan leaders resisted the PLA when they demanded taxes, which only resulted in their own execution. None of the general nomadic population actively resisted the PLA.

The years after the signing of the 17 Point Agreement saw an increase in hostilities between the Chinese and Tibetans in Lhasa, culminating on March 10, 1959. While the 14th Dalai Lama fled Tibet, Tibetans in Lhasa rose against the Chinese. The uprising was soon crushed, and the Tibetans found themselves without a leader. The leadership then fell into the hands of the second most important religious leader, namely the 10th Panchen Lama. Due to a dispute between the 13th Dalai Lama and 9th Panchen Lama over authority and rights of the government vis-à-vis that of religious lords, the 9th Panchen Lama fled into exile in PRC in 1924. He died in exile in 1937, and his successor was found in the same area, thereby becoming dependant on Chinese support and good will. The 10th Panchen Lama first arrived in Tibet in 1952, accompanied by units of the PLA. Consequently it was quite natural that The 10th Panchen Lama decided to work with the Chinese, and instructed his followers and subjects not to oppose the Chinese. Due to the Panchen Lamas influence with the Chinese central government, it was decided not to implement new economic and political reforms such as collectivisation in Tibet immediately. Instead a policy of gradually bringing Tibet into the socialist political system was introduced (Goldstein & Beall 1989; 1990). During this early period of Chinese rule, economic decisions, i.e. control of livestock and livestock production, remained in the hands of individual households. This was done mainly because the Chinese recognized that the economic system in Tibet was fragile, and that rapid reforms would cause serious economic damages. This was especially true for nomadic areas, where if animal numbers were reduced by excessive slaughter, it would not be possible to bring the number of animals up to productive levels again. It was therefore announced that there were to be no redistribution of animals and no class distinction in pastoral areas in this early phase (Shakya, 1999:244).

In early 1960 a new administrative structure was organized on the district level, and changes began to occur. Tibetans now found themselves being classified into a formal "class" structure, and people who had actively supported the 1959 uprising got their estates confiscated. "Class enemies" were found amongst the wealthiest Tibetans, and struggle sessions were organized all over Tibet. According to Goldstein & Beall (1990), the years from 1960-1966 passed with minimal disruption of the nomads' way of life in Phala. In 1961, organizing poor and middle class nomads into "mutual-aid" groups, consisting of several households sharing access to pasture, changed the production system. These groups were supposed to assist each other in daily tasks, such as herding, but all economic

decisions were rooted at the household level. Class enemies, or rich households were prevented from attending these co-operations, and they also had to pay higher taxes and were given poorer pastures. Nevertheless, nomads were still in control of their animals and production. At the present time there is no available information considering how this early phase of Chinese control were exercised in Aru, although there is reason to believe that a similar system as described for the Phala area was implemented.

3.4b Traditional Political Organization

Prior to 1959[5], the government of Tibet was primarily in the hands of Buddhist religious leaders, who managed large estates and religious endowments that supported a large network of monasteries. It was these institutions that owned the land and ruled the peoples, not individuals or their families (Barfield 1993:192). According to one of the oldest nomads from Rutok Xian, the Aru basin was under the jurisdiction of the Sera monastery in Lhasa before 1959. It is not clear how extensive the area that Sera controlled was, but nomads estimated it to reach from the area that today is called Gertse, up northwest to the Aru basin, and also a small area west of the Aru basin.

All of the land in Tibet was in principle owned by the central government in Lhasa, which distributed the land among the aristocratic families, great incarnate lamas, and monasteries for their upkeep and support. The nomads were tied to the land in the manner that their religious lord gave them rights to grazing areas. The right was hereditary, i.e. the nomads passed the right on to their children just as they got the right from their fathers (Goldstein & Beall, 1990). This was so because:

> "Since land alone, be it agricultural farm land or pastoral grassland, was not means of support without the presence of labourers to work it, the Tibetan system made things easy for lords by attaching labourers to these land grants" (Goldstein & Beall, 1990:54.).

This did not mean that the nomads couldn't leave their land. As long as the nomads fulfilled their obligations to their lords, they were more or less free to do what they wanted, e.g. travelling and go on pilgrimages. The lords were most interested in getting the goods from their land areas, and they not interfere with the day-to-day lives of the nomads.

[5] From now on referred to as the traditional era/times.

According to Goldstein & Beall (1990) the Phala nomads were the subjects of the Panchen Lama to whom they had to pay taxes and provide labour services. In exchange, the Panchen Lama and his officials were responsible for keeping law and order in the area.

The nomads owned their own herds and they managed as they saw fit, but they were not free to use grazing areas under the control of other religious lords. Being a subject included having rights as well as obligations, for example the lord couldn't evict them or refuse them access to his pastures (Goldstein & Beall, 1990).

As subjects of the Sera monastery in Lhasa the Aru nomads were obligated to pay a part of their production to the monastery as annual tax. They could choose if they wanted to pay in live animals, 1 yak or 6 sheep or 7 goats, butter and cheese, around 2.5 kg of cheese or 5 kg butter, or one bag of goat cashmere (*kullu*)[6]. An official representative from Lhasa came and collected taxes once a year.

If the nomads fulfilled their part of the bargain, which in this case only seemed to involve paying their tax on time, the nomads also could expect to get something back. For example, as Goldstein & Beall (1990) write, their lord had to maintain law and order. This of course presented a big problem in an area as remote as the Aru basin, which practically left the nomads to deal with problems regarding law and order in their own way. However, a time which the nomads refer to as "a very long time ago", the area, was harassed by a number of bandit groups. Consequently, the Sera Monastery in Lhasa had to send troops to arrest the bandits in the area. Therefore it is justified to assume that a similar system of rights and obligations as in Phala were present in the Aru basin and the areas around, although due to the area's remoteness, it was impossible for the monastery to exercise the same amount of influence and control over the nomad's life, as the Panchen Lama did in Phala.

During the traditional era, the nomads' production system involved:

> "[…] raising yaks, sheep, goats, and horses; harvesting their products; paying a portion to the lord as taxes; consuming a portion; and bartering yet another portion along with non-

[6] Taxes are based on a household owning 100 heads of livestock.

> livestock products, e.g., salt, to obtain other items such as grains and tea." (Goldstein *et al.,* 1990:148)

The nomads were mainly subsistence oriented, i.e. the production was oriented toward filling the nomads' basic needs for subsistence both directly and indirectly through trade. Trading was usually done with agricultural, monastic and trader communities in Tibet, although the Aru nomads also traded with Indian Ladakh, mainly because the basin is relatively close to the Indian border, making trade relatively easy. Ekvall (1968:51) writes:

> "Livestock can be moved on their own power to those communities, either by the traders who come to the pastoralist or as he himself drives them in the annual grain trading expedition."

Of course this trading was of mutual interest to the nomadic pastoralist, farmers and monks, since these communities were in need of products like meat, skins, hides and also butter, cheese, and the nomads needed tea and grain

3.4c The Cultural Revolution

Although the nomadic populations of Tibet were left to live relatively in the same way as before after the Chinese takeover, this was to end with the arrival of the Cultural Revolution:

> "The emergence of the "Great Proletarian Cultural Revolution" in eastern China in late 1966 set in motion forces that engulfed the nomads in a decade of pain and suffering and almost destroyed their way of life" (Goldstein & Beall, 1990:140)

The Cultural Revolution was marked by a campaign to destroy the four olds, i.e. old ideas, old culture, old customs and old habits, which was to have devastating effects on the Tibetan culture (Shakya, 1999). Everywhere people were mobilised to destroy religious and cultural objects and families were forced to abandon religious practise all over Tibet (Shakya, 1999).

The full force of the changes brought by the Cultural Revolution didn't affect the nomads in the Aru basin until 1972, when their lives changed overnight. In general, the pastoral technology stayed the same, but ownership of livestock and decisions regarding production was transferred from the household to the commune.

The Aru nomads were supposedly owners of shares in the communes, but in reality they were mere labourers who worked under orders by the commune leaders. The nomads in Aru were forcefully removed out of the basin and settled in communes in Xianqian xiang and Tsabo[7] (close to Rutok), where they were the subjects of commune leaders, and received work points, or "stars", for their labour. The work points became the basis on which they got food, goods and cash. Food was not distributed on the basis of the individual numbers of "stars", but rather on families total. The Aru nomads who until then had been in complete control over their livestock and livestock products, found themselves in the hands of political leaders with no prior experience in pastoral production. Decisions were based on political consideration alone, and not on practical consideration that had been the case up till then. Instead of making husbandry decisions based on individual nomads needs and herds capability, decisions, such as how many animals to slaughter, were now made politically, leaving the nomads in a state were food was in short supply and all their practical experience left to naught. Focus was not placed on production for the nomads but on supporting an increasingly starving population in more central parts of PRC. A central concept was that if the nomads were taught the correct political ideas, production would increase by itself (Goldstein & Beall, 1989 & 1990). The Cultural Revolution ended for the Aru nomads in 1983. With the dissolvent of the communes, private ownership of livestock was reinstated and religious practice was again allowed.

3.4d After the Cultural Revolution

The death of Mao Zedong in 1976 and the fall of the Gang of Four marked the beginning of a new cultural and economic liberalism in PRC, although the full impact of these changes didn't reach Tibet until 1980. For more remote areas such as the areas surrounding the Aru basin and the Aru basin proper, the new liberalism didn't arrive until 1983. During the early 80's Beijing officials, including Hu Yaobeng[8] and Vice Premier Wan Li, made

[7] Name of place is uncertain since no specific location has been possible to obtain.
[8] Hu Yaobeng was the general secretary of PCR's Communist Party in the 1980s, and died in 1989 (Wangdwei, pers com.).

several visits to Tibet to see how Tibet had fared during the 20 years of communist rule (Goldstein & Beall 1989). Accordingly they were not too happy about their findings, and brought one of the communist leaders in Tibet back to Beijing so that he couldn't intervene with planned reforms. Hu made public a list of six points criticising the governing of Tibet, e.g. stating that the living standards in Tibet lagged far behind that of the rest of PRC. To compensate for this, he stated that Tibetans should be excused from paying taxes and meeting state purchase quotas for a number of years (Goldstein & Beall 1989). Hu Yaobeng also stated that policies should be accommodated to the special situation in Tibet, furthering the economic development of Tibet, reinstating religious and cultural freedom. He also wanted a better education system in Tibet. These ideas found support in the Central Committee in Beijing, and where made the basis of several reform measures implemented in the 1980's and post 80's (Goldstein & Beall, 1989).

PRC's new Tibet policy also changed the system of production and improved the overall standard of living. By 1983 the communes in which the nomads previously inhabiting the Aru basin resided, were dissolved and all the commune's animals were divided equally among the nomads. Households now became responsible for their own production and marketing again, just as they had been during the traditional era. This reform was a part of major economic reform implemented in all of Tibet, called the system of "complete responsibility" (Goldstein & Beall, 1989:630; 1990). The nomads could again sell or barter their animals or animal production, as they wanted. Also, taxes and quota sales for nomads and farmers in TAR were cancelled, although the system of taxes were again implemented in the early 90's according to the Aru nomads, and quota sales of wool is again present in large parts of TAR.

4.1 The Aru Basin

Our study area, the Aru Basin is located in the northwest part of the Tibetan Plateau and is a part of the Chang Tang Nature Preserve (Figure 4.1).

Figure 4.1. The around 2,200 km^2 Aru Basin study area within the around 300,000 km^2 Chang Tang Nature Preserve. Two administrative districts divide the basin's grazing areas: Gertse xian and Rutok xian.

The Reserve was established in 1992, and it

> "[…] consists officially of about 247,00 km^2, but with another 37,000 km^2 of protected area contiguous with it to the west, the total is 284,000 km^2. This area was legally established by an administrative permit issued by the Tibetan Autonomous Region government dated 19 July 1993." (Schaller, 1998:6-7)

The reserve is relatively large, and is the second-largest reserve in the world. According to Schaller (1998) the size of the reserve is actually bigger than the official figures, making it close to 334,000 km^2.

The Aru basin is an approximately 2200-km^2 fully enclosed catchments situating mostly above 5,000 m elevation. The basin is a northwest-southeast trending catchment encompassing two large lakes, the freshwater Aru Co (4,960 m) which flows into the slightly salty Memar Co or Di-Ngorok Tso (4,940 m). The level of this latter lake, as it has no outlet, varies considerably between winter and summer. The 6,000 + m permanently snow-covered mountains along the western edge of the basin produce a moist and productive environment relative to much of the Chang Tang, and thus an attractive location for both wild herbivores and nomadic pastoralists. The Aru basin is one of the best wildlife areas in the entire 300,000 km^2 Chang Tang reserve, and has therefore been designated as a core area for wildlife protection within the reserve (Fox *et al*., in review).

4.2 Traditional Use of the Basin

Nomadic hunters have probably used the Aru basin for several thousands of years and by nomadic pastoralists for perhaps the past thousand years. However, little is known regarding this early phase of use. Hedin (1903) met nomads in a valley southeast of the Aru basin, in the beginning of the 20th century. At this time the Aru basin had a reputation of being inhabited by bandits and robbers. According to Rawling (1905) five bandits were caught and beheaded in this area by Tibetan officials at the beginning of the 20th century. Deasy (1901) reports that his camp was attacked and looted for baggage and animals in this area at the end of the 19th century. One of my informants told me that his grandfather had played a part in the robbing of "a few foreigners" at this time. Accordingly, the area got a reputation for being populated by bandits. It is probable that these "bandits", were in fact nomads that raided a camp of foreigners because the opportunity for an extra income presented itself. Ekvall (1952) notes that tribes of nomads in the eastern parts of Tibet weren't shy of raiding and robbing other camps or strangers if opportunity presented itself.

According to the old Aru nomads, their forefathers used the basin seasonally. The exact timeframe for this use is somewhat uncertain, but present inhabitants claim that their kin have used the basin for at least the last 200 years. Although they were nomadic pastoralists, the main reason for using the basin was its great hunting opportunities; wildlife was abundant. Accordingly, the basin was used mainly during winter, when hunting was at its peak. However, the extent of the use of the basin is unknown, estimates ranges from 10 families to 200 families.

4.3 Modern Use of the Basin

In 1960 the Aru basin was divided between two counties (xian), Gertse and Rutok xian, as part of the overall change in the administration structure of Tibet after the escape of The 14th Dalai Lama. In 1960 Tibet was divided into eight zones: Lhasa Municipality, Chamdo, Nyingtri, Lhoka, Shigatse, Gyantse, Nagchu and Ngari. These zones were further divided into xians, which again were divided into qus (area) level (Shakya, 1999). Although, remote areas like the Aru basin were affected by this change in administration much later than 1960, it marks the beginning of a new political structure in Tibet under Chinese rule. During this early period around 20 families used the Aru basin seasonally.

With the onset of the Cultural Revolution in western Tibet, in 1972 the basin was left vacant for around 15-20 years. The new phase of use started in the early 1990's. According to Schaller (1998:298): "Five households moved permanently to the Aru Basin in 1991 to hunt chirus[9]." Our data have shown that the 5 households Schaller mentions belong to one group from Rutok xian that use the basin all year around. Even though hunting traditionally has been an important aspect of the nomad's economy, it was not the main reason why the nomads moved back to Aru. In fact, some nomads moved back to what some of them referred to as their "homeland", partly based on personal interests and also because they were told to move there by the government.

4.4 Distribution of People and Animals

Today there are 3 "small groups" (Tibetan: *tsho chung*) of nomads from Rutok xian that use the Aru basin, and also some nomads from Gertse xian. At present I have much more information concerning the Rutok nomads than the Gertse nomads, making the information related to the use of the basin more accurate for Rutok than for Gertse.

4.4a Rutok xian

The Rutok side of the basin is divided between three groups of nomads, one group use the basin all year round, and two other groups use the basin seasonally for three months every summer. During our first fieldtrip, in June 2000, all of the three groups using the basin were present. During June 2000, these three groups consisted of totally 163 people that had 372 yaks, 12,009 sheep and goats and 5 horses (Table 4.1). The relative distribution

[9] Chiru is Schaller's (1998) name for the Tibetan antelope. Since the Tibetan antelope is not really an antelope (Vrba & Schaller, 2000) chiru will also be used here.

between the groups is shown in Table 4.2. Group 1 in Table 4.2 uses the basin permanently while Group 2 and 3, use the basin seasonally.

Table 4.1. Numbers of people and livestock in the Aru basin during 2000-2001. Information is based on both counts and interviews[10].

Season/Location	People	Yak	Sheep & Goats	Horses
June 2000				
Gertse	?	165	3650	13
Rutok	163	372	12009	5
Total	163	537	15659	5
Sept.-Oct. 2000				
Gertse	67	178	3838	10
Rutok	60	157	3079	0
Total	127	335	6917	10
June 2001				
Gertse	59	163	3131	29
Rutok	50[11]	330	7035	0
Total	109	493	10166	29

Table 4.2. The relative distribution of people and livestock between the individual groups in the Aru basin during 2000-2001. Information is based on interviews and headcounts.

Season/Location	People	Yak	Sheep & Goats	Horses
June 2000				
Gertse (Nr. of groups unknown)	?	165	3650	13
Rutok				
Group Nr. 1	59	164	4704	0
Group Nr. 2	39	54	2518	3
Group Nr. 3	65	154	4787	2
Sept.-Oct. 2000				
Gertse				
Group Nr. 1	46	108	2619	10
Group Nr. 2	21	70	1219	0
Rutok				
Group Nr. 1	60	157	3079	0
June 2001				
Gertse				
Group Nr. 1	43	85	1816	29
Group Nr. 2	16	78	1315	0
Rutok				
Group Nr. 1	50	149	2615	0
Group Nr. 2 & 3[12]	?	181	4420	0

[10] Numbers for Rutok xian during June 2000 and September/October 2000 in Table 4.1 and 4.2 is based on interviews only, while numbers for Gertse xian during June 2000 is based on headcounts done by the biologists. Numbers for Gertse xian during Sept.-Oct. 2000 is based on interviews only. As for June 2001, numbers are based on both headcounts and interviews done by the author.

[11] This number only refers to 1 group of nomads from Rutok, and the number of people from the 2 other groups is unknown. See Table 4.2 for detail.

[12] Due to lack of time and petrol, group number 2 and 3 were never interviewed during our fieldtrip in May/June 2001. Numbers are therefore based on headcounts.

However, as can be seen from Table 4.2, Group 1 experienced a decrease of around 1500 animals from June to September/October 2000. This cannot be explained by a decrease in livestock numbers due to natural disaster, wolf (*Canis lupus)* attacks, or butchering. The nomads from this group reported almost no loss of animals during the summer. One reason for this decrease could be that we interviewed more people or households in June than September/October. However, this is not the case, in fact we have information from the exactly same numbers of households in September/October 2000, and the number of people had increased due to childbirth somewhere between June and September. As a consequence it is probable that this decrease in animal numbers is connected to uncertainties related to the information collecting process during the first fieldtrip. What I think may have happened is that I got a "double count" during our first fieldtrips, i.e. when asked how many male and female sheep the nomads had, they also included their animals' lambs and kids. When asked how many kids/lambs they had, they dutifully answered and I got "double numbers". During the second fieldtrip, the first nomad interviewed, actually responded to questions about kids' numbers with the statement: "I have already given you that through the numbers of males and females", making "double count" a plausible explanation. Calculations done to "test" this theory shows that this cannot completely explain the decrease. Therefore, when I later use material to show compositions for average households for Group 1 from Rutok Xian for 2000, I have based the calculations on numbers from September/October. Group 2 and 3 were not in the basin during our second fieldtrip, making a comparison between periods impossible and numbers are taken to be accurate. However, there are reasons to believe that, on overall, the numbers I got during September/October 2000 and June 2001 are more accurate, since I spent more time in the basin, and were able to double check my numbers, both by counting and ask for the numbers several times.

The number of people and animals were separated between 15 households in Group 1, 8 households in Group 2 and 13 households in Group 3. Although officially the groups have no name, Group 1 is called Kontrok Tsho chung [13], number 2 is called Longdo Tsho chung and the nomads call Group 3 Amtchuck Sale Tsho chung.

[13] When 'tsho chung' are discussed in general, both the term 'tsho chung' and 'small group' will be used, but when discussing a specific 'small group', i.e. by stating its name, only the name and the term 'tsho chung' will be used.

In September/October 2000, only members of Kontrok Tsho chung were present in the basin. The number of people had increased due to a birth, giving a total of 60 people, 157 yaks and 3,079 sheep and goats (Table 4.1). The two other groups had moved to their autumn grazing areas outside of the Aru basin.

During our last fieldtrip to the Aru basin in May/June 2001, members of Kontrok Tsho chung and 3 tents fro Amtchuck Sale Tsho chung were present upon our arrival. The rest of the members of Amtchuck Sale and Longdo Tsho chung arrived later in June; however, the specific time and number of tents and people are uncertain. I never had the chance to visit them due to shortage of petrol and wet roads. Therefore the number of animals for these groups in Table 4.1 is based on headcounts only. Although table 5.1 shows that there were only 50 people using the Rutok side of the basin during May/June 2001, this number refers only to Kontrok Tsho chung. As we can see from Table 4.2, the number of people and animals in Kontrok Tsho chung has undergone a dramatic decrease from September/October 2000 to May/June 2001. This was to a great extent caused by three families leaving the group to join another group outside the basin. They had experienced a series of misfortunes in the Aru basin, e.g. their winter house had been destroyed by water during the spring of 2001, and a lama (*bla ma*) had advised that they should move to another group. The group had also experienced livestock losses due to snow, giving a total of 50 people, 149 yaks and 2,595 sheep and goats divided between 12 tents for Group number 1. A total of 181 yaks and 4,420 sheep and goats were counted that probably belonged to the two other groups (Table 4.2).

4.4b Gertse xian

Due to our short stay within the Aru basin in June 2000, I never had any chance to spend any time with the nomads from Gertse xian, and therefore the numbers from this period is based on headcounts only, and no number of people was obtained (Table 4.1 & 4.2).

During September/October 2000 there were 13 households from Gertse xian present within the Aru basin. They were separated into two tsho chung (small groups); Group 1 consisted of nine households, while Group 2 consisted of only four households. Group 2 were part of a larger group, but according to the nomads, only four households from this group used the basin for 1 month annually. Since we had less time with the nomads from Gertse xian, information concerning their use of the basin is not extensive. However, according to the

distribution of winter houses, it seems that at least seven households use the basin permanently, and they all belong to Group 1. The rest move their livestock camps outside the basin during winter. During September/October 2000 there was a total of 67 people, 179 yaks, 3,838 sheep and goats and 10 horses using the Gertse side of the basin (Table 4.1). Group 1 consisted of 46 people, 109 yaks, 2,629 sheep and goats and 10 horses, while group 2 consisted of 21 people, 70 yaks and 1219 sheep and goats (Table 4.2).

During our last period, May/June 2001, there were only 11 households from Gertse xian within the basin, but only 6 of the households interviewed during the previous period were present. The rest of the households were not in the basin during September/October 2000. This indicates that there is a greater rotation in households using the Aru basin from Gertse xian than from Rutok. Although I group these households into 2 groups, they are not identical with the two groups from September/October 2000. Group 1 from September/October 2000 consisted of six households that also were present in Group 1 during May/June 2001. Group 1 therefore consisted of these six households plus three households, which were not encountered during our previous visit. Group 2 consisted of only four households, all of which were only in the basin to visit relatives, and do not use the basin regularly. The total number of people and animals during this period was, 59 people, 158 yaks, 3430 sheep and goats and 29 horses (Table 4.1). Group 1 consisted of 43 people, 78 yaks and 1795 sheep and goats, whole group 2 consisted of 16 people, 80 yaks and 1280 sheep and goats (Table 4.2). I do not know the relative distribution of horses between the groups, although Table 4.2 shows that Group 1 had the total of 29 horses in its possession.

4.5 Different levels of Administration and Organisation in TAR

4.6 Formal Level of Organisation

According to Goldstein & Beall (1990:24) the administrative structure in TAR today is made up of "seven large administrative units called "prefectures," each containing some of Tibet's 77 "counties" (*shen*). These in, in turn, are made up of "districts" (called *chü*), or qus, as Shakya (1999) calls them, containing "villages" (*shang*)." Goldstein's shen and shang is the same as I, from now on, refer to as x*ian* (Tibetan: *rdzong*) and *xiang (*Tibetan: *shang)*. Each xiang or village is made up of what is called c*uns*, (Tibetan: *grong tsho*) which further are divided into *tsho chung*, or 'small groups' (Figure 5.1). According to one

informant from Xianqian xiang, cuns used to belong to chüs years ago, but that chüs are now dissolved, at least in some parts of TAR.

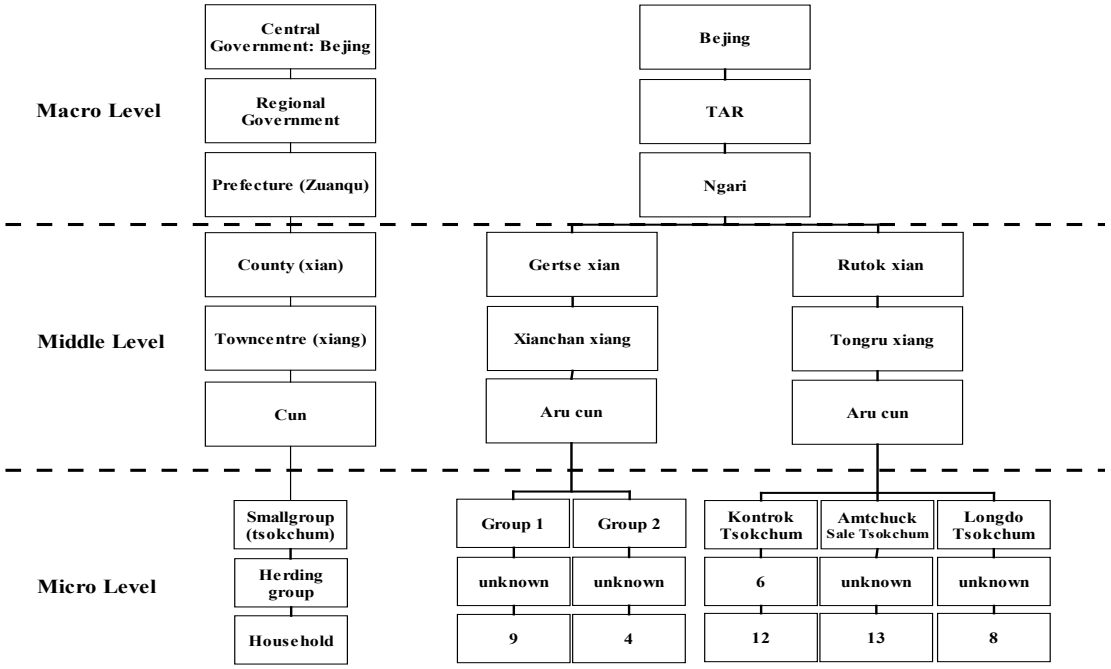

Figure 4.1. The administrative structure in the P.R.C relevant for TAR, and specifically the Aru basin.

In Figure 4.1, 'Micro level of organisation' refers to the level of organisation and decisions that is within the basin, i.e. how the Aru nomads are organised and make decisions. Organisation here can be said to be informal, since it is not recognised officially by higher levels of organisation (however, small groups are recognised as an organisational level by the government). 'Middle level of organisation' on the other hand refers to a level of organisation that has direct administrative power over the nomads. In the same way as the 'Macro level of organisation', 'middle level' refers of organisation and decisions that are placed outside of the basin and that are formal, i.e. they are political institutions. I will mainly deal with the lower levels of organisation, although decisions taken on higher levels influencing the Aru nomads will also to some extent be dealt with (see chapter 11).

4.7 Informal Level of Organisation

We can distinguish between three different 'micro' levels of social organisation: 'small group level' *(tsho chung),* 'herding group level' and 'household level' (Figure 4.1). Although households have control over their own production, they share grazing rights with other households and also sometimes share herding responsibilities.

4.7a Tsho chung

The Aru nomads are organized into groups that share access to a grazing area, e.g. Kontrok Tsho chung from Rutok xian is considered as a group because of the fact that they share grazing rights to a specific area, in which only members of this group can keep their animals. Groups within the Aru basin are therefore separated geographically, and are as such recognized as distinct groups by the government. The members of Kontrok Tsho chung also perceive themselves as a group because of the fact that all the members share kinship ties (Figure 4.2). This is also the case for the other small groups (*tsho chung*) using the Aru basin; Figure 4.3 (page 53) shows the genealogical relationship between Kontrok Tsho chung and two groups from Gertse, and also within the two groups from Gertse. However, since genealogical information concerning the two groups from Rutok xian that use the basin seasonally is scarce, it will not be dealt with here.

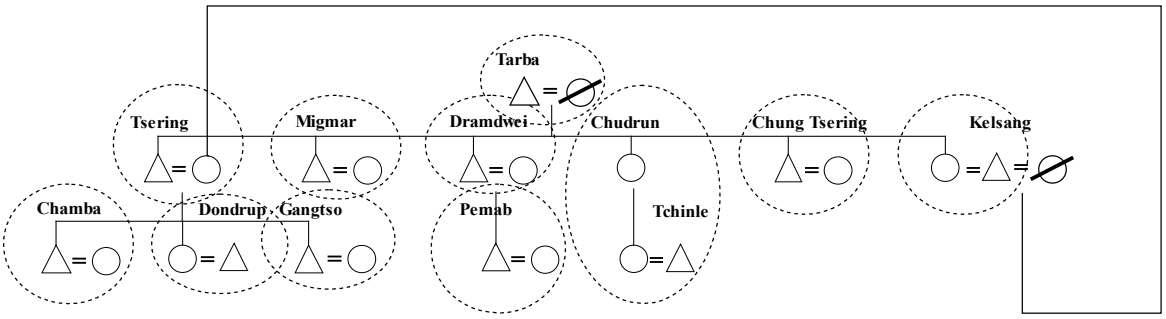

Figure 4.2. Depicting the genealogical relationship between 12 households in Kontrok Tsho chung, Rutok Xian. Stipulated lines indicate households.

The kinship system in Aru is cognatic, i.e. kinship is calculated both through the mother's and father's line. There are no firm rules for inheritance, and upon marriage the person who is to be wed is entitled to a part of his/her father's herd. For example if a household consists of seven people, the person who is to be married is entitled to 1/7 of the total herd, whether it is a daughter or a son. Also, more often than not, the child that lives within his/her natal tent upon the death of both parents usually inherits the parent's tent and the remains of the herd, a practice referred to in literature as ultimogenitur. However, sometimes nomads want to donate their earthly goods (herd, tent, cooking equipment etc.) to a monastery to get religious merit, which can increase their chance to get a better rebirth[14] in the next life. This is decided by the persons in question, and is usually done

[14] Although the term rebirth is somewhat ambiguous and difficult to define in Tibetan Buddhist philosophy, Lopez (1997:22-3) writes that for ordinary beings rebirth is a "[…] harrowing process, a frightful journey

when all of the living children already have left their natal home and set up an independent household with their share of the animals.

The five households that moved back to the Rutok side of the basin in 1991 laid the foundation for Kontrok Tsho chung. In 1994 the group's size increased to 10 households, and in 1999 there were 12 households (Figure 4.2). From 2000 to 2001 there were 15 households in this group, but since three households as previously mentioned moved out during the summer of 2001, there are now only 12 households in this group. Maintenance of and recruitment to this group have basically been through marriages.

It is important to note that Schaller & Gu (1994) writes that: "[…] in 1991, 5 families (~ 40 people) moved their 600 sheep and goats and 45 yaks into the [Aru] basin permanently to hunt wildlife." Additionally 21 families with approximately 8,600 livestock used the basin seasonally at this time (Schaller & Gu, 1994). As mentioned before, these 5 families are the starting point for Kontrok Tsho chung, and if Schaller & Gu (1994) are correct, this group has experienced a dramatic increase in livestock number, from 600 animals in 1991 to 2,600 animals in 2001 (Table 4.2). At the same time, the number of people has increased from 40 in 1991 to 50 in 2001. On the other hand, it seems strange that the number of animals reported by Scaller & Gu can be a correct, since it is difficult to explain how this group possible could have managed to increase their herd to such an extent in 10 years. The same 5 families had 1,400 sheep and goats in 2001, and together with the fact that these families both have distributed large parts of their herds to married children, and also most probably have been slaughtering some parts of their herd, it is not very likely that they arrived in the basin with only 600 sheep and goats.

Also, contradictory to Schaller & Gu's (1994) findings the nomads themselves claim that the number of animals has decreased dramatically from 1991 and up till now. According to information they provided, these 5 families came to the basin in 1991 with around 2,900 (around 100 yaks, and 20 horses) totally. If this is true, the nomads from this group have

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into the unknown, a process over which one has no control. One is blown by the winds of karma into an intermediate state (*bar do*) and then into a new lifetime… The process of powerless rebirth is a beginningless cycle and can only be brought to an end by the individual achievement of liberation and enlightenment through the practice of the path."

experienced a decrease in livestock numbers, most likely because of predation, blizzards and redistribution of livestock to married children. However, most likely animal numbers fluctuate and more research is needed.

The 5 households that laid the foundation for Kontrok Tsho chung constituted my principal informants. Therefore, I will present them in more detail.

Tarba[15]

Tarba is the oldest nomad in Kontrok Tsho chung. Although he is somewhat uncertain regarding his own age, he is probably around 75 years old. He can be said to be the founding father of this group, since all households are related to him by blood or by marriage. He was my principal informant regarding historical data, especially concerning the situation in Aru before the Liberation (1959). Both his father, grandfather and great grandfather used the Aru basin, and he felt that the basin was his "homeland". He actively helped the PLA during the early stage of the Liberation by providing them with road directions etc. and as a reward he was appointed as one of the leaders of today's Xianqian xiang in the late 60's.

He has four sons and two daughters having separate households in Kontrok Tsho chung. Although he leaves the responsibility of herding his animals to his sons and daughters, I consider him to be a separate household, both because he usually lives alone and because he is in charge of making decisions regarding the use of his animals' product.

Kelsang

Kelsang is also one of the oldest nomads in the basin, although he is a few years younger than Tarba. He was one of the five households that first moved back to the basin after the Cultural Revolution in 1991. What he did before this is somewhat unclear, since he doesn't remember the past very clear. He is married to one of Tarba's daughters, and has four children, three daughters and one son.

Tsering

Tsering was to become my principal informant, both because we established a good relationship and because he was willing to share his vast knowledge about the nomads in

[15] Names have been changed to protect the persons discussed.

Aru. He has eight children, of which five still live in the natal household. Two of his sons, Chamba and Gangtso, and one of his daughters have established separate households within this group. Although he is too young to remember anything from before the Liberation, he knows a lot about the present situation of the Aru nomads. He is one of the leaders for Aru cun, and also the leader of Kontrok Tsho chung.

Migmar

Migmar can be considered as the richest nomad in this group, as measured in number of animals. He has by far the largest number of animals; during May/June 2001 he had around 500 animals. However, he used to have more animals: before the winter of 1997-98 he had around 1,200 animals, but during the winter he lost half of them, and has never been able to increase his herd to the same number again. Nevertheless, his herd is still one of the largest in the basin and because of this he usually herds alone and puts up his tent away from the other nomads. He has 7 kids living with him, giving him a substantial work force. One of his sons is married, and lives with his wife's group on the Gertse side of the basin.

Dramdwei

Dramdwei functions as a kind of doctor for the nomads in Kontrok Tsho chung. He attended a month long course in Rutok a couple of years ago, where he learned about medicines and how to administer them. He has one son, Pemba, who is married and lives in a separate household in the group.

The increase in households from 1991 up till the present in Kontrok Tsho chung was caused by marriages. The nomads in Tibet practise exogamy, i.e. they find marriage partners from outside of their birth group, but there are no specific rules to decide whether the wife-to-be should move to the husband-to-be group or vice a versa, which is referred to as ambilocality in the literature. The young couple's parents, who assess the need for labour during such times, largely determine this. Marriages are prearranged, i.e. parents decide who will marry each other. Even though different Tsho chungs within the basin live far apart, they have close connections. All the groups I encountered knew of people in other groups, regardless of xian. This is most probably due to the Cultural Revolution, when many families that previously lived far away from each other had to live and work close together in "communes".

Groups, in other words, have connections to other groups from which they can recruit suitable marriage partners. For example, Pemba is married to a young woman from Gertse, and they are now part of Kontrok Tsho chung. She is the daughter of Lhakchung, leader of Group 1 from Gertse xian (Figure 4.3). Lhakchung used to by a xiang leader together with Tarba in the early 60's, giving them a good relationship through which they can recruit suitable marriage partners for their children and grandchildren. One of Migmar's sons is married to a woman from group 2, Gertse xian, and is currently residing with this group (Figure 4.3).

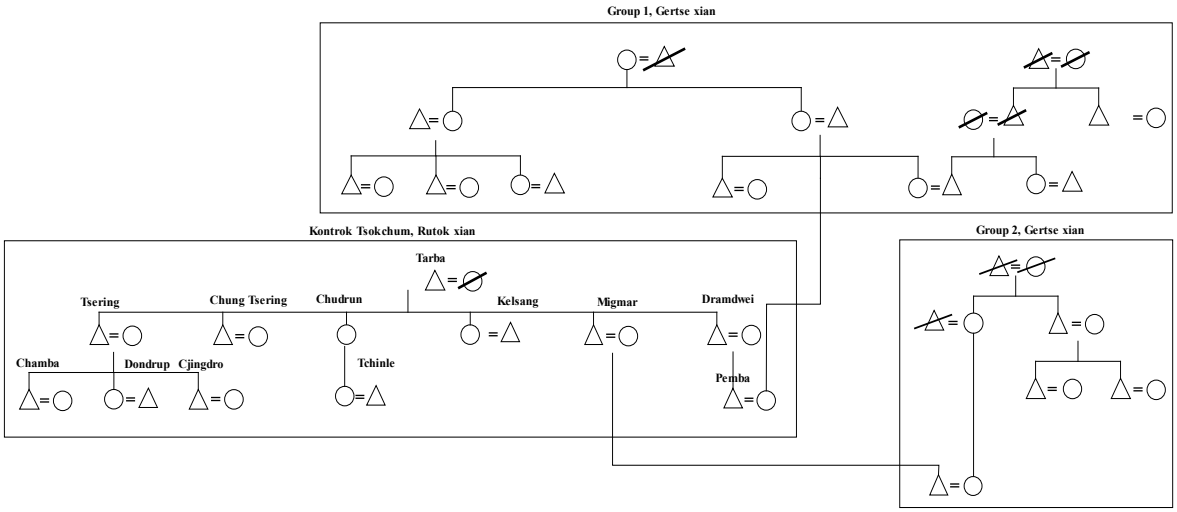

Figure 4.3. Marriages between Kontrok Tsho chung, Rutok xian and groups from Gertse xian

As Figure 4.3 shows, only three marriages have been established between Kontrok Tsho chung and the two groups from Gertse xian recently. One reason being that the groups relatively recently arrived the basin, another is that members from Kontrok Tsho chung have kin in other groups outside the basin, and who also have been helping them providing them with marriage partners. For example, Dondrup came from Drabo[16] xiang (Rutok xian) in which one of Kelsang's sons from a previous marriage lives, and who helped Tsering finding a husband for his daughter. The same is also the case for Gangtso's wife. However, the extent of the kin relations reaching outside the basin is at present unknown. Although most marriages are prearranged, coincidences also play a part in these decision-makings. For example, one of Tarba's daughters, Chudrun said:

> "*I remember when I was at the doctor in Rutok. There I met a woman and we began to talk, and during our talk we developed a good relationship. I found out that she had a brother*

[16] Place name is uncertain and location has not been established.

that had yet to find a wife. I told her that I had a daughter that was at the right age for getting married. After some discussion, we agreed that they should get married, that they would make a good match."

Three months after this meeting took place, they were married, and Tchinle moved to Kontrok Tsho chung in Aru. In this case, Tchinle mainly moved to Aru because Chudrun wanted him to. She also has two children of very young age and has never been married herself. Therefore it was important for her to get a husband for her daughter that was willing to move to Aru, and thereby recruit extra labour. This was corroborated by the fact that although Tchinle and his wife have control over their own animals and production, they usually herd their animals together with Chudrun's animals and also share a tent or winter house with her.

Each tsho chung has a leader, which is selected by the people in the group. Tsering, who is the leader of Kontrok Tsho chung (Rutok xian), is also one of the leaders of Aru Cun. Accordingly, a leader of a cun is both elected by the nomads and appointed by the xiang, i.e. the xiang has to accept the man that the nomads want as leader. The leader's responsibility is to function as a link between the nomads and the local authorities; he is for example responsible for informing the nomads about current political ideas, making sure that the nomads do what the local leaders want them to do and he is also supposed to deal with whatever problem the nomads face. For example, during our first fieldtrip in the summer of 2000, Tsering was writing a report about the problem with livestock losses relating to wolf attacks and poisonous grass. Previously the leader was also responsible for collecting data on livestock numbers, which were given to the xiang. However, this practise seems to have changed. During our last trip we were told that people from the xiang now come out to do the count, probably because of fear of underreporting. Although all small groups (tsho chung) don't necessary have an official leader, they still have a leader figure.

The organisation of nomads into 'small groups' (tsho chung) is not a new phenomenon; the nomads told me that they used to live together in 'small groups' (tsho chung) before the "Liberation", mainly consisting of people with kinship ties.

4.7b Herding Group

During the second fieldtrip to the Aru basin in September/October 2000 I discovered that most of the nomads share the responsibility of daily herding. At first I thought that each individual household had responsibility for the daily herding, since ownership of animals and their production are in the hands of individual households. However, I soon found out that this was not the case; instead households go together and form units that I will call *herding groups*. A herding group is defined as a unit that shares responsibilities for the daily herding of the members animals. A herding group therefore consists of animals from several households. Although some households herd their animals alone, for the sake of the discussion they will also be referred to as a herding group. What I term herding groups is not a new phenomenon in Tibet. Levine (manuscript) describes what is called *rukor* (*ru skor*) among the Gologs[17]. The term refers to people who lived side by side and herded their animals on collectively held rangelands. Rukor is almost synonymous with *rurog* (*ru rogs*), meaning 'households of friends' (Levine, manuscript). The people in these rukors or rurogs helped each other in the daily lives mainly by helping

> "[…] one another search for lost animals, guard the animals against thieves, conduct seasonal moves, provide workers to substitute for someone who was ill, and so forth. Members of rukor households would travel together to distant markets to buy grain and other commodities and trade on behalf of a household unable to send a representative along with them. A poor household might borrow animals from rukor neighbors. Gelek (1998:50) describes rukor households as complementing one another's inadequacies, so that a household rich in livestock but poor in workforce would cooperate with one having surplus workers but inadequate herds." (Levine, manuscript: 2)

As such, rukor is not so much different form what I term 'herding groups'

4.7c Household

A group consists of several households, which in this context is analytically defined as a unit, containing a number of people who inhabit one tent or house, and who also has ownership or access to a herd of animals and their production, and who also decides how to use its own labour. Households make decisions related to the allocation of capital, i.e. what to do with their animals and their production. For example, it is up to the household

[17] "The term Golog is an ethnonym used by dispersed populations living in Qinghai, Sichuan, and Gansu provinces. These people share a common culture ans speaks distinctive dialects of Tibetan." (Levine, manuscript: 1). Most Gologs practise transhumance.

to decide how many animals they should slaughter before winter. A typical household within the basin is self-sustaining, i.e. their livestock products provide the Aru nomads both directly, with milk and meat, skins and wool, and indirectly with products that are either sold or exchanged to obtain other products, such as grain, tea etc. Although I refer to Chudrun as one household, the Aru nomads do not view a household consisting of only an unmarried woman and young children with ownership over their own animals and their production as a separate unit.

Although several households go together in the daily herding, the control of the animals and the production still lies within the household, and a distinction between households and herding groups in relation to Paine's (1964) terms herding and husbandry in connection with herd management. The different tasks and decisions taken in the 'household' and 'herding groups' can be discussed in relation to the differentiation Robert Paine (1964) has made between the terms *herding* and *husbandry*[18]. Herding is about having control over the herd in the terrain, e.g. making sure that the animals gets adequate nourishment, protection from predators. Husbandry, to Paine (1964:79), is "[…] the efforts of the owners in connection with the growth of capital and the formation of profit." Allocation of capital is the individual households, full responsibility, and need not be discussed with members of the herding group.

[18] According to Dyson-Hudson (1972:14) the terms 'herding' and 'husbandry' would be meaningless to East African pastoralists since " […] it is precisely the job of a herd-owner to reconcile the needs of livestock and humans." Accordingly, the distinction is less useful in subsistence herding situations, and is more applicable to pastoral societies with some degree of market orientation. However, according to my interpretation, these terms are analytical and tries to conceptually differentiate between decisions that are more 'economic' in nature, i.e. decisions trying to accommodate the herds potential for growth (husbandry), e.g. breeding, culling, slaughtering etc., and decisions that regards the spatially movement and welfare of the animals while out herding (herding). Of course, these are only separated analytically, since action taken in the environment with the herd will have economic consequences, i.e. lack of care can lead to loss of livestock. Also, husbandry decisions can affect the herders ability to control his/her herd in the terrain, since the composition of herds are of crucial importance for herd dynamics.

Part Three: Living with Risk and Uncertainty

Chapter Five: The Pastoral Mode of Production in the Aru Basin

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The Aru nomads rely mainly on three different species of domesticated animals, sheep, goats, the indigenous yak and horses. Also, in some areas people keep a crossbreed between yak and cattle, called *Zomo* (female) and *Zo* (male) which is more adapted to living at lower altitudes than in the Aru basin (Bishop, 1996). Horses must be considered as a luxury item only, since they have no subsistence relevance and are mainly used for riding when travelling long distances. Horses are not very common in the Aru basin, mostly because they are an easy prey for predators. Almost all households interviewed had lost a horse or two at one time or another to wolves.

5.1 The animals

5.1a Yak

Picture 5.1. A mother with a newborn yak

The domestication of the yak (Picture 5.1) was probably the single most important factor in making it possible for people to adapt to the ecological marginal areas of the Tibetan plateau (Ekvall, 1968; Goldstein & Beall, 1990; Miller, 1998) The yak is unique to the Tibetan Plateau and surrounding areas, and it is very well adapted to the cold and high altitude of the Chang Tang. Tibetans usually call the yak *nor*, a word that normally translates as "wealth" (Goldstein & Beall, 1990). The term yak only refers to the male nor, while *dri ('bri*) refers to the female. An adult male yak weighs between 200-250 kg, and is about 1.2 m tall at the shoulder and 1.3 m long, while female yaks are around 20-25 percent smaller (Goldstein & Beall, 1990). Traditionally yaks were used for transportation purposes, since they are extremely powerful and display great endurance at high altitudes (Goldstein & Beall, 1990), but today trucks are more commonly used for transportation purposes in the Aru basin.

Yaks also provide the nomads with food, shelter and clothing. The yaks coarse belly hair is spun and woven into tent material. The much finer cashmere wool, or *kullu* as the Aru nomads call it, is used to make ropes and blankets. Traditionally, the yaks' hide was used to make soles of shoes or boots, but nowadays most nomads prefer to buy shoes, which, although of lower quality, are labour saving. Yaks also provides the nomads with meat, the butchering weight of a full-grown male yak can be as much as 80-125 kg (Goldstein & Beall, 1990). Also, the female yak can provide large quantities of milk throughout the year.

5.1b Sheep and Goats

Picture 5.2. Sheep & goats being brought to pasture.

The sheep and goats that inhabit the Tibetan Chang Tang Plateau are adapted to a life at high altitude (Picture 5.2). Sheep have more haemoglobin and larger lungs than sheep living at lower altitudes, and also a thick coat of wool (Goldstein & Beall, 1990). Goats also have more haemoglobin, more red cells, and breath four times faster than goats living at lower altitudes (Goldstein & Beall, 1990). Both sheep and goats produce milk, meat and wool and skins for the nomads. Goats produce more milk, and for longer periods of time than sheep, but the Aru nomads prefer milk and meat from sheep. Although the yak is usually considered to be the main distinguishing animal in Tibetan nomadic pastoralism, sheep were traditionally more important in the Tibetan nomads' overall economy. For example, Ekvall (1968:11-12) writes:

> "In some communities a few goats – generally considered lowland stock more advantageously kept in the "door herds" of an agricultural community – are found. They are usually rated of less value than sheep".

Also, Goldstein & Beall (1990:83) writes:

> "Traditionally, they [goats] were less valuable than sheep because there was no market for their hair or cashmere and little for their meat since villagers prefer mutton."

However, it is probable that goats played a more important role in the economic life of nomads inhabiting the Aru basin and surrounding areas, because of their close proximity to the Indian border, more specifically to the Ladakhi market. Ekvall (1968:11-12) for example writes "[…] in western Tibet, one breed [of goats] having particularly fine under fur, produces the valuable fibre known as "cashmere." Accordingly, there has been a long tradition of trading cashmere wool between nomads of the western parts of Tibet and traders from Ladakh; also cashmere wool was to some extent used to pay taxes. That not withstanding, sheep were traditionally more important for the overall economy for the Aru nomads than goats, because of the preference for sheep milk and meat. However, as I will return to later, because of the recent increase in economic value of cashmere wool, on the national and international market, this is about to change.

5.2 Livestock Products

Livestock products directly provide food, clothing and shelter for the Aru nomads. Also, indirectly through trade, livestock provides the nomads with other products like grain, tea, ironware and clothes.

5.2a Dairy Products

Sheep, goats and yak all give milk, an important product for the Aru nomads. The obtaining and processing of milk is women's responsibility. Milking is a time consuming activity, especially during the summer season when animals are sometimes milked twice a day, once in the morning and once later in the day or in the evening. Milking is done in quite a unique and inventive way. Animals are tied together, creating two lines of animals facing the opposite direction, making it easier for the women to milk them. Both sheep and goats are tied, intermixed in the same line (Picture 5.2).

Picture 5.2. Milking is done by tying sheep and goats in two lines facing opposite directions. Milking is done by women.

Milking is not without its danger for the animals, and the nomads have to keep an eye on the milking line at all times. For example: during my stay in the Aru basin in May/June 2001, we witnessed the death of three sheep during milking. The sheep stepped into a small hole in the ground, causing the line to move so that other sheep and goats ended up on top them. This resulted in three sheep being suffocated, a loss heavily felt by the family in question, not only because of the loss of three milk producers, but also because they lost three animals that contributed to their herd's natural reproduction. The nomads do not consume meat from animals that die of accidents or natural causes, so the meat from these animals was lost.

Picture 5.3. Butter churning.

The nomads do not consume much milk; instead they use the milk to make other products such as yoghurt, butter and cheese. Yoghurt is made by heating milk to its boiling point, then cooling it off a little, before finally a "starter" is added. The yoghurt sits covered overnight, the end product being rich, somewhat sour and smooth yoghurt, called *sho* in Tibetan. Some of the yoghurt is consumed directly, while most of it is being churned into butter. Women usually use a wooden churner for making butter, although they sometimes also use a container made of sheep's stomach (Picture 5.3. The container is inflated so it almost looks like a balloon, yoghurt is then poured into it, and a woman shakes the container back and forth on her lap for a couple of hours. The end product is fresh butter. During summertime, when milking is at its peak yield, butter can be made almost every day, giving the nomads fresh butter to have in the Tibetan "national drink", butter tea[19]. During peak season, the nomads also make butter that they can store for use in seasons when milk is scarce. Traditionally, butter was stored in small containers made from sheep's stomach, but today it is more and more common for them to store butter in metal containers. The leftover liquid from the butter-making process is either consumed directly, as low-fat yoghurt like product called *tara*, or boiled and filtered, giving a white, corned cheese. The cheese is either consumed fresh, or left drying in the sun making the cheese into hard

[19] Butter tea is made up of tea, butter and salt, and can be more easily compared to a mild soup or broth than tea.

pieces that is edible for many years. The cheese is called *churra* in Tibetan, and can be chewed for many hours, without noticeable reducing it's size (Picture 5.3).

Picture 5.3. Cheese prepared for drying, making *churra*.

The leftover liquid, after the cheese is removed is usually given to dogs and only sometimes eaten by the nomads. It can also be boiled until it becomes a dark and thick concentrate, which is regularly used as women's black make up, claimed by the nomads to give a much needed sun protection, but according to Goldstein & Beall (1990:89) it's sun protecting ability is questionable, and is probably used to enhance beauty.

5.2b Meat Production

Goldstein & Beall (1990:98) describe the slaughtering process like this:

> "Killing is done in the manner that conserves the blood for use in sausages. Sheep and goats are killed by inserting a long (3-5") sewing needle between the two vertebrae in the neck, while the yak is killed with a sword. Because of their size, killing a yak requires the cooperation of several nomad men who first must lasso the animal, pull it to the ground, and bind its four legs… a sword about two feet long is inserted into the stomach and slowly thrust upward to penetrate the heart. It is left there, or moved back and forth, for about 10 minutes until the animal dies."

I never witnessed the killing of a yak by the Aru nomads, and can't say if they do it the way just described. However, the few killings of sheep and goats I witnessed in the Aru basin were not done the way this quote describes. Rather, the nomads held the sheep, or goat, down to the ground, tying a rope around its mouth and covering its nostrils, thereby suffocating the animal to death.

During November/December the nomads in Aru slaughter all of the animals they need for surviving throughout the winter since it is the best time for slaughtering; the animals have then built up stores of fat from summer grazing, which adds to the meat a much

appreciated taste, and have not yet started to lose weight as they do during winter and spring. Slaughtering at this time not only make sure that each animal yields the maximum calories, but also makes storage easier. During November/December it is so cold that the carcasses freeze solid, making the problem of meat spoilage non-existent. The cold makes processing of meat unnecessary, and carcasses are stored whole, usually in the tents or are left hanging in their winter houses. It is not uncommon to see heads from sheep and goats lying around on the tent floor, or other parts from animals lying partially covered by the tent sides. The Aru nomads also slaughter a few animals throughout the year, depending on the household's need for food.

Slaughtering is considered to be a male task, and there is a taboo against women killing animals. As several nomads stated: "*if women kill animals, it will bring bad luck to our tent*". In Aru there are usually young men, starting around 16 years of age that both kill and slaughter animals (Picture 5.4). However, Goldstein & Beall (1990) report that most nomads in Phala do not do their own slaughtering. Since most of the Aru nomads are Buddhist, they believe that the taking of life results in bad *karma*[20], which again can lead to a bad rebirth. Traditionally, nomads of some wealth hired other nomads, usually poor nomads needing the wages, to do the slaughtering for them. However, I only talked to one nomad who clearly stated that he tried to avoid the slaughtering of his animals:

Picture 5.4. Young men are responsible for slaughtering.

> "*Because I am a Buddhist, I feel that the killing of animals are bad. I sometimes hire other people to do the slaughtering for me, giving them a sheep or goat as salary. Sometimes this is not possible, and I, or my kids, have to do it*."

[20] "Like other Buddhists, Tibetans believe that every intentional act, whether it be physical, verbal, or mental, leaves a residue in its agent. That residue, like a seed, will eventually produce an effect at some future point in this life or another life, and effect in the form of pleasure or pain for the person who performed the act." (Lopez, 1997:11) This is most commonly referred to the law of karma.

One explanation why the Aru nomads generally do not hire other nomads to do their slaughtering is because that they are relatively poor, and cannot afford to pay other people to do it for them. Another reason can be the fact that the Aru nomads traditionally also engaged in subsistence hunting, making killing of animals inevitable.

Every edible part of the animal is sooner or later eaten, usually after it has been boiled for some time, but nomads also eat raw meat from recently slaughtered animals. Sausages are made by chopping up organs and intestines into fine pieces and then put into intestines and boiled.

5.2c Wool, Hair, Skins and Animals

Sheep, goats and yak provide the Aru nomads with more than just meat and dairy products. Sheep give wool, which the Aru nomads both sell and use for weaving, skins are used for clothes; stomachs are made into containers, which they use for making butter and storage. Live animals are, to some extent sold or traded, although it is mainly seen as a last resort, since sold animals stops contributing to the herds size.

5.2d The Nomads Use of Wool, Hair and Skins

Sheep and goats' skins, with fleece, were traditionally used to make the heavy-robe like clothes used by the Aru nomads during winter, called chuba (*phyu pa*). The chuba looks like long belted robes, almost touching the ground for women, while men's reach just below the knees, and has long sleeves which function as gloves when it is really cold. The fleece side of the skins is turned inwards, making the robes very warm and comfortable. The chuba is usually made from 10 adult sheep' or goat's skins, and the making of the chuba, or other clothes, is men's responsibility. There is a constant need for skins in making of the chuba, since the fleece wears thin over time, making it less efficient in keeping the nomads warm. The Aru nomads therefore rotate on a yearly basin who will get a new chuba, since a family can't afford making one chuba for each family member every year. Chubas are usually not thrown away, since a worn down chuba can easily be worn during summer, when the weather is warmer. Some nomads also just patch up their old chubas by cutting out the most worn down fleece and replacing it with pieces of new skins. A much more luxurious version of the *chuba* is made out of around 35 lambs and kids, and is called tsatsa (*tsha tsha)*. However, the Aru nomads do not make this garment very often, since killing of kids and lambs affects the herd's growth negatively. On the other hand,

nomads use skins from lamb and kids that have died of natural causes in making the tsatsa. Lamb and kid skins are also used for making comfortable sleeping mats, or bags for newborn children, since they are both warm and soft to touch. Even though the Aru nomads still make most of their own clothes, they have recently begun to buy more and more of their clothes, for even though the quality of bought clothes are poorer, buying clothes saves time and animals compared to making them.

Picture 5.5. Traditional tent (Tibetan: *ba*) made of yak hair.

The yaks coarse belly hair is spun and woven into tent material. The much finer cashmere wool, is used mostly to make ropes, but also blankets and storage bags. The Aru nomads do not sell yak cashmere, since even though it is a soft and fine type of wool, it does not give a good price on the governmental markets. Nomads in Aru also have very few yaks and prefer to keep this wool for themselves. The long coarse hairs from goats are used in making ropes.

There are no trees providing the Aru nomads with firewood on the Chang Tang Plateau, they instead have to collect dried dung from their animals to get fuel necessary for cooking. Both sheep, goat and yak dung is used as firewood, although yak dung is preferred since it is larger and therefore easier to collect.

6.1 Introduction

The concept of 'limiting factor' is widely used to reduce complex ecological problems to manageable proportions. Even though organisms must cope with a multiplicity of environmental problems, their survival is usually limited in any given context by just one or two critical resources. The Aru nomads are dependent on their animals to survive, and as such *animals* can be said to be both a limiting factor and a critical resource. The *ecological environment* on the Tibetan Plateau in general is quite harsh and heavy livestock losses are often experienced as a result of heavy snowfalls and severe cold weather (Cincotta *et al*., 1991; Goldstein *et al*., 1990; Miller, 1998 & 2000; Schaller, 1998). As a consequence it is important to describe what particular ecological constraints the pastoral system of the Aru basin have to interact with, since this can be viewed as contributing to increase risks of falling below a minimum subsistence level, i.e. minimum number of animals.

According to Halstead & O'Shea (1989) *variability* may be conceptualized in two different ways, (1) as a variation in food supply, or (2) by describing the factors that influence the availability of a particular food, in this case animals. As for the Aru basin, the question can be conceptualized as what ecological factors influence the number of animals at any given time? An important aspect then arises as to the timing, frequency and severity of these factors.

6.2 Ecological Constraints: Environmental Hazards

6.2a Blizzards

Blizzards occur frequently on the Tibetan Plateau. For example, a Russian explorer noted over 100 years ago that a caravan consisting of 1,000 animals on its way from Lhasa to Xining, in modern Quinghai Province, lost all of their animals in a blizzard (Prezewalski 1876 in Schaller 1998). Jiang (in Miller, 2000) reports that from 1955 to 1990 six harsh winters with heavy snowfall on the Tibetan Plateau resulted in 20 to 30

percent loss of livestock. Schaller & Ren (1988) reported heavy snowfall of 30 cm in October 1985 and temperatures around –40 C in southwestern Qinghai, resulting in the deaths of large numbers of wildlife and livestock. Goldstein & Beall (1990) reported that there was a hundred percent neonatal mortality of sheep and goats among nomads in the spring of 1988 in the Phala area of Shigatse Prefecture. Especially the winter of 1997-1998 was one of the worst in recent history for most of the nomadic pastoralists on the Tibetan Plateau (Miller 2000). Miller (2000:83) writes:

> "Unusually heavy snowfall in September was followed by severe cold weather and additional blizzards throughout the fall and winter. By the spring of 1998, an estimated three million head of livestock had died in the Tibetan Autonomous Region. In some townships, 70 percent of the livestock was lost. Almost one quarter of a million nomads were affected and hundred of nomads families lost all their animals."

During the winter of 1996-1997, some nomads in the Phala region experienced losses up till 70 percent of goat kids and 30 percent of sheep lambs and the loss of one quarter of their adult goats (Miller 2000). Livestock losses due to snow also occur during summer, Goldstein & Beall (1990) reported that after five days of snow in the summer of 1986, one nomad area lost 30 percent of its livestock.

Other parts of Tibet experienced unusually heavy snowfalls in late September 1997, followed by severe cold that prevented the snow from melting (Miller, 2000). The bad weather continued, and by early November, grass reserved for winter grazing was buried under deep snow, leaving the livestock without access to the grass. Animals soon started to starve and die, since it is not common for Tibetan nomads to harvest hay for their animals.

In the Tibetan Autonomous Region (TAR), especially Naqu Prefecture in the north and Ngari Prefecture in the west were affected hard by the severe winter. But also parts of Shigatse, Lhoka, and Chambo prefecture and Lhasa Municipality were affected. Some townships lost up till 70 percent of their total livestock population, and by April 1998 it was estimated that TAR had lost over 3 million heads of livestock, this has been estimated as a loss of US$ 125 million (Miller 2000). The consequence was that thousand of families faced dire poverty.

Miller (2000:88) writes:

> In the summer of 1997, before the blizzards began, it was estimated that 30 percent of Naqu Prefecture's 340,000 nomadic populations were considered to be living in poverty. As a result of the livestock losses experienced during the winter of 1997-1998, it is now estimated that about 40 percent of the nomad population in Naqu Prefecture will be facing poverty situations. Thousands of other nomads, although still technically above the poverty line, have had their livelihoods greatly diminished."

Snow, and then especially blizzards, affect the Aru nomads as well nomadic populations in other parts of Tibet. For example, during the winter of 1997-1998 Migmar lost half of all his animals of around 1,200 sheep and goats. Tsering also lost around half of his herd of 1,000 one night in 1997. Also, nomads from Amtchuck Sale Tsho chung told me that the whole group had lost around 500 animals during this winter.

However, snowfalls in the spring of 2001 have also had significant effects on livestock survival in the Aru basin. During our fieldtrip in May/June 2001 the 12 resident from Kontrok Tsho chung, Rutok xian, reported an average of 35 percent mortality to their livestock this past year, against an average recruitment of newborns of 20 percent. Thus, there was an overall decrease in livestock numbers since the summer of 2000. The high losses were attributed primarily to severe snowfall conditions especially during April and May (we saw many carcasses of sheep and goats near some of the late winter encampments). Within the 12 families from Kontrok Tsho chung, nine experienced an overall decrease in livestock over the past year, whereas three saw their herds increase (Figure 6.1).

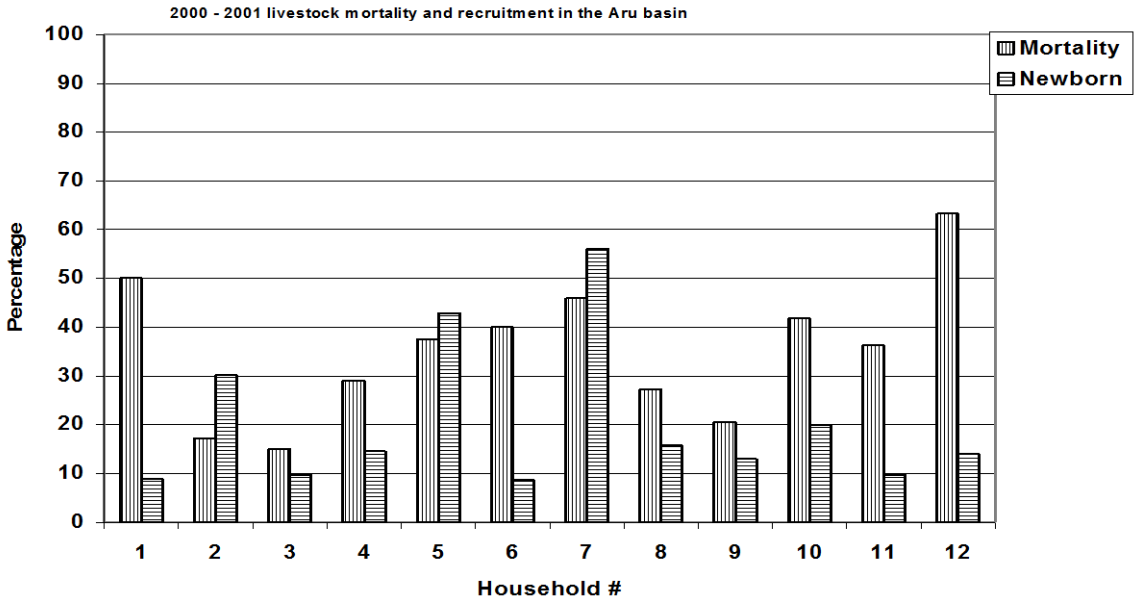

Figure 6.1. Livestock (sheep, goats, yaks) mortality and recruitment (newborns), as a percentage of June 2000 population size, for Kontrok Tsho chung.

Families in the Aru basin that chose campsites near the mountains (where forage is better) might have been most detrimentally affected by the severe snow conditions that are associated with sites near the high mountains. Furthermore, a moderately high frequency of such losses would not be surprising given the severe environmental conditions on this part of the Tibetan plateau. The livestock losses and births varied considerably from one family to another, ranging from 15 percent to 63 percent mortality and 9 percent to 56 percent recruitment (Figure 6.1), based on herd size from June 2000.

Blizzards vary according to a temporal and spatial scale since while some household in Kontrok Tsho chung experienced deaths of many animals other experienced almost none. The highest reported number was 200 animals for one household, while the lowest was 6-7 animals. Nomads from Gertse xian reported almost no losses; the highest reported loss from one household was 10 animals. Although blizzards can be viewed as seasonal or annual phenomena, i.e. the temporal scale is relatively known, they happen during winter or early spring, blizzards are unpredictable for individuals within the system due to the spatial structure of the phenomena, i.e. site-specific differences in the area. As a consequence livestock losses will probably vary between households, as shown in Figure 6.1. There is no way for a household in the Aru basin to predict where and when the next blizzard will occur, and thereby take their precaution. This of course results in uncertainty

regarding annual production for individual households, and has traditionally been offset by the possibility of hunting wildlife for food.

Since, the Aru nomads rely on livestock for living, any loss of animals will have consequences for their *production system*. As a consequence the Aru nomads are faced with a great variability in their production system: some years they have enough, while others they can barely eat. On the other hand, it is difficult to give any estimate to how severe a problem e.g. blizzards are in the long run for the Aru nomads, since I do not have any historical information concerning the fluctuation in number of livestock caused by ecologic factors. As seen from Figure 6.1, the problem from 2000-2001 is severe since 9 families experienced an overall decrease in number of livestock due to snow. The fact that the mortality rate was higher than the rate of newborns could cause problems within the next year. Since the number of animals for some of these families before next winter is lower than if the rate of newborns was higher than the death rate, a blizzard could again cause severe problems, leading to a downward spiral and possible ending up with some households falling below the minimum subsistence level. Although I do not have enough historical information, to conclude that snow annually kills large numbers of livestock in the Aru basin, nomads themselves claims that this indeed happens. Although the severity of blizzards varies, nomads claim that every year some households lose animals. As Tsering said:

> "*Every year we ask the local leaders for help because of animals killed in blizzards. Every year they promise help, but nothing ever happens*."

As such the nomads themselves perceive that blizzards cause deaths and is a risk to their production system.

6.2b Predation

The main carnivore species causing problems for the nomadic populations of Tibet basin are: Wolf, Tibetan Brown Bear (*Ursus arctos)* and the Snow Leopard (*Unica unica*). All of these species are known to kill livestock and are considered to be a constant threat. Schaller (1998:209) writes:

> "The occasional killing of livestock by wolves and snow leopards has brought pastoralists and predators into such conflict and become such a contentious issue that it affects the future survival of both species. As livestock numbers increase, herders penetrate ever higher into the mountains or into marginal pastures on the plains, bringing prey and predators into more frequent adverse contact."

Even though Schaller (1998) writes that a part of the conflict between pastoralists and predators is based on increase in livestock numbers, and the movement of pastoralist to even more marginal areas, i.e. areas where there has not been pastoralists before, killing of livestock by predators is by no means a new phenomenon. Ekvall (1968:41) writes:

> " Beasts of prey are a lesser but equally constant menace [i.e. as other pastoralist stealing livestock]. Wolves are most feared and do greatest damage. Only occasionally do they hunt in packs, but a pair of hungry wolves – nearly white brutes as large as timber wolves – can decimate a flock of sheep and will attack cattle when the latter are weak… More rarely, snow leopards and lynx take to raiding the herds, and brown bears, newly out of hibernation and hungry, will attack sheep."

Nomads feel strongly that they should be allowed to kill wolves, and also would like the government to help them with the wolf problems. Today it is illegal to kill both wolves, bears and snow leopards, although the forestry police claim they look the other way if nomads kill wolves. However, hunting of wolves have been endorsed by local governments in Tibet, e.g. Goldstein & Beall (1990:113) writes that after wolves killed several female yaks in 1998, local Phala officials placed a reward on killing wolves.

Goldstein & Beall (1990) also report that wolves attack and kill sheep and goats, yak and horses in Phala every year. They also write that lynx (*lynx lynx*) and snow leopards occasionally kill livestock, but that it is wolves that cause most damage. This is a constant concern for the nomads, but it is very little they can do to keep this from happening, except being vigilant. The nomads keep dogs loose during nights to either scare wolves away from trying to kill livestock, or chase predators away if they do attack. Some nomads also put out large metal traps, since it is almost impossible for them to kill wolves with their traditional flintlock rifles.

As for the Aru basin, predators are considered to be a threat. Schaller (1998:209) reported that five households in the Aru basin lost about 4.5 percent of their animals to wolves during 1991. Wolves are also the main reason why the Aru nomads have lost most of their horses, and some nomads said that they never would buy horses again because:

> "*If I buy a horse, I have to keep an eye on the horse all the time or else it will soon fall prey to a wolf. Of course, it is not possible for me to watch a horse all the time, so I will not buy one again*."

Bears also kill livestock, but not to the same extent as wolves do. During our fieldtrip in May/June 2001 I observed three bears, one alone and two together on two different occasions. These bears were wandering quite far away from any settlements, but the areas they wandered in had been used for grazing by livestock two or three days before. One household reported that they had lost 13 animals to one bear in the course of one night during late winter of 2001. During my stay in September/October 2000, one household had to put up a satellite camp a couple of km away from the nomads main camp because of a contagious eye disease in their herd of sheep and goats. However, two days after we arrived they moved back because one night they saw a bear close by their campsite, and felt it would be safer if they moved back to the main camp. Snow leopards, on the other hand, are shy, and live in areas away from people settlements, although if they get a chance they too are capable of killing livestock in large numbers.

6.2c Poisonous Grass

According to the nomads in the Aru basin, there is a species of grass that will kill animals if they consume it. This grass is called *tom* in Tibetan, and according to Schaller (1998) it is a legume called *Oxytropis stracheyana* that can be toxic. Although poisonous grass has been present in the basin for as long the nomads can remember, they now feel that it is increasing throughout the grassland, which again makes it a bigger problem for their livestock. If animals eat poisonous grass it can, according to the nomads, take a very long time before they die. One nomad described the problem like this:

> "*If one of my goats or sheep eats tom during spring, it can die in winter. We know it has eaten Tom because the animals' start to shiver and shake, making strange head motions and*

will not eat grass. When it is dead we sometimes open up its head, and it looks like the brain has been eaten by insects."

During our first fieldtrip, June 2000, one household reported that they had lost around 50 goats to *tom*.

Nonetheless, Schaller (1998) writes that both chiru and kiangs *(Equus Kiang*, Tibetan: *rkyang*) were observed eating this legume, and writes that this may be because plant defences may be efficient in some situations but not others, caused by a number of factors e.g. nutrient content and passage rate. Only during severe shortage will animals eat it. Snow can therefore create a cumulative effect: animals starve and become desperate for food. They then forage on poisonous grass, leading eventually to their deaths.

6.2d Grassland Degradation

> "It is said that the rapid increase of grazing animals in the pastoral areas (from approximately 29 million in 1949 to 90 million in the early 1990s), as well as a decline in the area of rangeland due to reclamation (an estimated loss of 6.5 million hectares over 1949-92), has led to serious rangeland degradation and desertification [i.e. in PRC]. In 1994, over one-third of usable rangeland had been reported degraded to a certain degree, while total biomass production per hectare had declined to 30-50 percent of that in the 1950s." (Ho, 2000:241)

The preservation of the People's Republic of China's grasslands is of paramount importance to scientists and development planners in PRC, since of the total 9.6 million km^2 of PRC's surface areas, 41.7 percent was estimated in 1989 to be rangeland (Ho, 2000). However, the extent of a possible ecological degradation is unknown, although the China daily newspaper reported that 15 percent of PRC's grassland had deteriorated by the mid 70's, and that it had increased to 30 percent by the mid 80's (China Daily 1987 in Goldstein & Beall, 1990). Although it is very difficult to assess the state of the grassland in the Aru basin, the Aru nomads claim that the quality of the grass has decreased since they returned to the basin in 1991. According to them, this is largely caused by the presence of wildlife.

6.3 Risk and Decision Making: The Example of Slaughter

Blizzards and predation can be viewed as increasing "the probability of loss or hazard" (Cashdan, 1990:3), which again can negatively influence *minimum herds* size, as understood as the necessary subsistence minimum for the household or the group in question (Khazanov, 1994, Spooner 1973). These factors also contribute to increase the "[…] unpredictabilities in the number and quality of animals and animals products" (Göbel, 1997:41). As a consequence:

> "[…], herders cannot reliably predict what quantities of meat, wool, hides, milk and cheese they will have to dispose of. These uncertainties do not only affect decision-making concerning herd management (e.g., frequencies of movements with animals, fodder and work force requirements), but also consumptions patterns and the reliance on other income possibilities. They also have an impact on economic exchange. In view of these imponderabilities long-term economic planning is impossible." (Göbel, 1997:42)

Too many animals culled will influence the size of the herd. A smaller herd, if the herd is struck by a blizzard that kills many animals, will influence the herd's recuperative ability.

Faced with this, slaughter becomes a highly risky enterprise. For example, Chamba, the head on one household in Kontrok Tsho chung had a herd of total 79 animals (2 yaks, 53 sheep and 24 goats) in September/October 2000, and by the summer of 2001 this number had been reduced to a total of 51 animals (2 yaks, 33 sheep and 16 goats) due to large amounts of snow.

To a household with this few animals, slaughtering is a time when husbanding decisions are carefully considered. If they choose to slaughter out of pure need, the consequences could be disastrous, since there is no way of telling how harsh the coming winter will be, i.e. if they will lose a lot of animals or not. For example, in December 1999 this household slaughtered three animals, which gave them meat that lasted for a period of three months after carefully saving. To live well by eating meat during winter, a family of this size would need meat from around 20 animals. According to other nomads one adult needs meat from around 10 sheep or goats to last through the winter (the child in this household is too young to eat much meat). However, this would be impossible for a household with a herd of Chamba's size, during the winter of 2000-2001 they lost around 35 percent of their

total herd. If they had slaughtered 20 animals before this winter the total loss would be almost 50 percent, if the number of animals lost during bad weather stayed the same. Also, an average household in the Aru basin consisted in 2001 of 5 people, 14 yaks, 173 sheep and 88 goats. To eat well a household of this size would have to slaughter around 100 sheep/goats for the winter 2001/2002, which would make up around 40 percent of total herd size. At the same time, lamb and kids made up around 20 percent of total herd size. As such, to eat well, the offtake of the herd would be higher than the recruitment, which could be the start of a downward spiral ending up below minimum subsistence level, especially when faced with ecological unpredictability.

As a consequence, the time of slaughtering is a time when the future of a nomadic household can be decided: too many animals killed can lead to the erosion of their existence base; and too few killed can lead to starvation. Chambas household is not the only household in the Aru basin feeling that their livestock production is not capable of filling their basic needs. Only one household out of 29 interviewed during September/October 2000, reported that they were capable of killing enough animals in December to keep them with enough meat throughout winter.

6.4 Are Poorer Households more Vulnerable to Hazards?

The general numbers of animals have repercussions when faced with an unpredictable environment. Templer *et al.* (1993:112) write that there is a tendency to view disasters, such as blizzards, droughts etc., in terms of their regulating effect on livestock numbers, i.e. that blizzards "[…] can cause massive fluctuations in the livestock holdings of individual households, not discriminating between rich and poor:" However, Fratkin & Roth (1992) give evidence that suggests that climatic shocks have greater impact on poor households than rich ones in Africa, since although environmental shocks affect all households equally, it will have greater impact on the livelihood of resource poor households. Accordingly, Templer *et al* (1993:113) shows that the same was the case for Mongolian herders during the winter of 1993:

> "[…] although richer herders lost more livestock in absolute terms, poorer herders may have lost a greater proportion of their herd and therefore may have seen their ability to obtain a livelihood significantly more eroded than their wealthier counterparts."

Their results show that richer herders will of course lose more animals in absolute terms, but that poorer herders tend to lose a larger percentage of their herd than richer herders. In other words, poor herders, when experiencing natural calamities, are faced with an increasing risk of falling below a minimum subsistence level. As a consequence, environmental shocks should not be viewed as natural mechanisms that equals out differences between poor and rich herders.

The Aru nomads have fewer animals per household than nomads from Nyima and Shuanghu counties (Fig. 6.2).

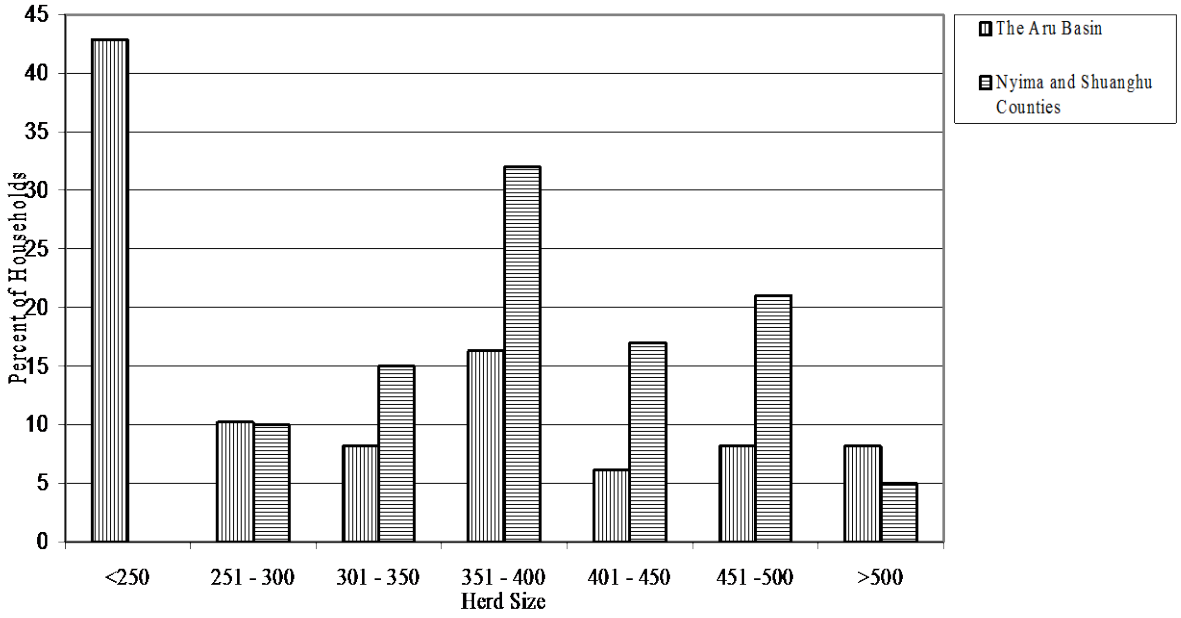

Figure 6.2. The total number of livestock per nomad household in Nyima and Shuanghu Counties compared to the Aru Basin. Numbers for Nyima and Shuanghu adapted from Schaller (1998:304, Figure 15.8)

Approximately 30 percent of the nomad households in Nyima and Shuanghu counties own 352-400 livestock (Schaller, 1998:304, figure 15.8), whereas in Aru only 16 percent have such herds. Furthermore, no households in those counties had below 250 heads (Schaller 1998), nearly 45 percent if the Aru households have less than 250 animals (Fig. 6.2). Consequently, the Aru nomads are worse of than nomads from Nyima and Shuanghu if faced with a disaster.

On the other hand, compared to other areas of Tibet, the Aru nomads seem to be relatively well off, with only Phala, Takring and Dangmo having on average fewer animals (Table 6.1)

Table 6.1. Average number of people and animals per household from different locations in Tibet.

	People	Yak	Sheep	Goat	Horse	Total	SEU	SEU per person
Aru Basin								
June 00[21]	4,6	10	222	111	0,1	343	642	141
Sept.-Oct. 00	4,5	12	165	82	0,4	259	239	53
May/June 01	5	14	173	88	0	275	255	57
Phala[22]	4,5	19	82	74	0	175	241	54
Naqu:								
Nyima[23]	5,4	14	220	144	2	380	418	77
Shuanghu[24]	5,8	18	282	107	4	411	469	81
Takring[25] **Township**	5,0	31	38	12	0	81	204	41
Dangmo[26] **Township**	5,0	30	52	15	0	97	216	43

However, this comparison can be viewed as problematic since sheep, goats and yaks do not have the same value, and as such only numbers from the Aru basin, Nyima and Shuanghu and Phala can be compared on the basis of average animals per household since they have approximately the same ratio of small stock (sheep and goats) and large stock (yaks). Large stock comprises only around four percent of total number of animals for Aru, Nyima and Shuanghu, and fourteen for Phala (Miller, 2000; Goldstein *et al*., 1990). Also, my data from the Aru basin that were collected 10 years later and obtained in a different way (government records vs. nomad interviews), than that of Schaller's (1998) and 12 years later than that of Goldstein *et al*. (1990). I have no idea of what has happened between these two points in time, and we could argue, that maybe Goldstein *et al*. (1990) happened to be in Phala when the numbers were extremely low, and that the data from Nyima and Shuanghu refer to a year where the nomads were only lucky considering the number of livestock, since Schaller (1998) states that nomads do experience livestock losses due to severe blizzards and cold weather, making livestock numbers fluctuate on a year to year basis. Nevertheless, if the Aru nomads have fewer animals per person than the nomads

[21] As previously discussed, numbers from this period is questionable.
[22] Information from Goldstein *et al.* (1990), interviews and headcounts 1988.
[23] Information from Schaller (1998) from county records 1993.
[24] Information from Schaller (1998) from county records 1993.
[25] Information from Miller (2001), township records 1999.
[26] Information from Miller (2001), township records 1999.

from Nyima and Shuanghu they are, following Fratkin & Roth (1992) and Templer *et al* (1993) in greater risk of falling below a minimum number of animals.

However, average number of animals does not necessarily tell us anything about relatively wealth or poverty. Table 6.1 shows that nomads from Phala, Takring Township and Dangmo Township in Table 6.1 are relatively poorer than the Aru nomads if measured in numbers of animals. A way out of this is to calculate 'Sheep Equivalent Units[27]' (SEUs). Accordingly, the difference between SEU is not that large between Aru, Phala, Takring Township and Dangmo Township. Also, the relative range between rich and poor is not indicated in this table. For example, Miller (2000) reports that the SEUs for a rich family of nomads in Phala, Shigatse Prefecture in 1997 consisting of 6 persons, was totally 1010 SEUs, with 168 SEUs per person. In the Aru basin, Migmar, one of the richest nomads, had during September/October 2000 around 570 SEUs, giving them only around 63 SEUs per person.

In TAR nomads are usually considered poor if their annual per capita income is below approximately US$ 80. As for animal numbers, household with number of animals below 25 SEUs per person are considered poor, since families with less than 25 SEUs would not be able to meet their basic needs (Miller, 2000). Kelsang had approximately 218 SEUs worth in animals during September/October 2000, giving this family 36 SEUs per person. Although this is supposedly above the official poverty line, this family received 50 kg flour, 50 kg barley and 3 kg tea as welfare in 2000. On the other hand, numbers are only from a selected few places in Ngari (Aru), Naqu (Nyima, Shuanghu, Takring and Dangmo) and Shigatse (Phala) and as such cannot be used to indicate general trends of poverty or wealth in these areas.

6.5 Summary

From an ecological point of view, blizzards can be viewed as a regulatory mechanism, since periodic heavy snowfall reduces both the number of livestock and wildlife that use the rangelands, thereby providing time for the rangeland to recover after possible heavy grazing (Miller, 2000). However, evidence from Africa and Mongolia suggests that climatic shocks have greater impact on poor households than rich ones since although

[27] SEUs are calculated on the basis that one adult sheep is 1 SEU, 1 adult yak equals 5 and 1 adult goat equals 0,9 SEUs (Miller, 2000).

environmental shocks affect all households equally; it will have greater impact on the livelihood of resource poor households (Fratkin & Roth, 1992; Templer *et al.,* 1993).

Unlike areas where there is drought and the effects on livestock are prolonged, blizzards can cause the death of many animals, even decimation of entire herds, in a couple of days or weeks. On the other hand, blizzards do not affect the vegetation negatively, as droughts do in semi arid areas, increased water presence can in fact lead to improved grass growth the following season. This again gives the recuperation of herds an advantage: whereas in semi arid areas during a drought, vegetation is almost non-existent making recuperation impossible until the vegetation starts to grow again, on the Tibetan Plateau although many animals have died as a result of blizzards, when the snow melts the grass is there for the use of the still living animals. Tibetan nomads have dealt with blizzards and cold weather for thousands of years, making nomadic pastoralism in Tibet a high-risk enterprise (Goldstein & Beall, 1990; Miller, 1998; Miller, 2000). As seen, the Aru nomads' animals are greatly affected by random, unpredictable and uncontrollable ecological factors, especially blizzards, but also the cumulative effects of e.g. snow and poisonous grass. These uncontrollable ecological factors change from year to year, and cause growth and decrease in herds so as they function in a non-stable manner, sometimes even decimate entire herds (Goldstein *et al*., 1990; Miller, 1998). As such their production system can be viewed as highly variable and unpredictable, and nomadic pastoralist in Tibet have therefore adopted a number of flexible livestock production strategies, and other subsistence strategies that minimize risks and tries to make optimal use of the resources available to them.

Chapter Seven: Safety Through Diversification

7.1 Introduction

As previously mentioned, strategies for countering unpredictability and variability within a production system can be grouped into four basic categories, namely (a) diversification, (b) mobility, (c) physical storage and (d) exchange. What will be discussed here is (a) diversification, where the underlying principle is that by broadening the base of subsistence system, either by using a wider range of plant and animal species or by exploiting broader and more varied areas (i.e. niches), reduces the risk of catastrophic shortages. This chapter will deal with low-level mechanisms of risk reducing strategies, since no high-level mechanisms of risk responses seem to be in place in the Aru basin at present. The low level mechanisms discussed will be that of (1) subsistence diversification, and (2) species diversification, but also breeding will be discussed as a strategy for reducing risk.

7.2 Hunting

> ”In ancient time, one mountain surrounding the Aru basin and Aru Tso [Lake] were considered to be the holiest mountain and lake in the whole of Tibet. The place was abundant with wildlife and our ancestors used to come here to hunt. However, our ancestors became greedy and hunted too many animals, making the gods angry. The gods decided that they should move the holy mountains and lake to another part of Tibet, and that is how Kang Rinpoche [Mt. Kailash] today is the holiest place in Tibet, and Mapang Jungsto [Lake Mansowar] is the holiest lake.” Tarba.

Although a legend, this shows that the Aru nomads have had a long tradition for hunting, both herbivores and predators. Predators such as bears, snow leopards and wolves because they preyed on the nomads’ livestock (and still do). Herbivores such as the chiru, blue sheep (*Pseudois nayaur)*, Tibetan gazelle (*Procapra picticaudata)*, wild yak and kiang because they provided the nomads with a secondary source of meat, skins and furs.

7.2a Hunting Techniques

The nomads in Tibet relied mostly on traps (Goktse (*gug rtse*), Tseka (*btsod bkag*) and Tsedung (*tshad dong*)) and the Tibetan flintlock rifle (Ponda (*bod mda'*)) when hunting.

Picture 7.1. Demonstrating how too use a leg-hold trap.

Goktse (*gug rtse)* is a leg-hold trap (Picture 7.1). The trap consists of a ring, about 15-20 cm in diameter, which is mainly made from small brush branches, or anything available, covered with yak fiber. Up to a dozen sharpened prongs made from chiru horns converge down and inward so that when animals step into the trap, the prongs prevent it from withdrawing the leg. The rope is usually secured to a stone in summer, to secure the trap from being torn loose when the animal struggles to get free. During winter water is poured over the rope, freezing it to the ground. The Aru nomads used goktse (gug rtse) to catch antelopes, gazelles, blue sheep and kiangs, the only animal they never caught with this trap was wild yak. However, since animals have different size of legs, the traps were made in different sizes, for wild assess the ring had to be made much bigger, and for gazelles the ring had to be made smaller. For antelopes and blue sheep the size was the same. The leg-hold trap was used in combination with a Tseka (*btsod bkag*) or Tsedung (*tshad dong*) (see below), but sometimes it was used alone. For example, the nomads know where the Tibetan gazelles, blue sheep and chirus walk, since they usually use the same paths all the time, and a clear trail is often visible in the terrain.

According to the nomads, gazelles use the same hole to urinate in every day, and traps can be put in these holes or close by. However, kiangs do not move in the same fashion, they were caught by placing traps close by watering places. When the animals were caught in the trap, the nomads would kill them by throwing stones, since lead for making bullets was hard to get by. However, this wasn't without danger, the male chiru have long sharp horns, which could easily hurt or even kill hunters.

Tsedung (*tshad dong*). The chirus have special holes in the grounds where they take resort to when it is warm, or when they want to escape flies. According to the nomads, one antelope only has one of these special holes in one area, and whenever an animal comes back to the same area, it will use the same hole. The nomads made these "resting" holes deeper and put a leg-hold trap inside, then covered the trap with sand (Picture 7.1). When the chiru came back, it would lie down, and when it wanted to leave, its leg would get stuck in the leg-hold trap. This trap was used in summer, but the nomads claim that they stopped using this way of hunting in the late 60s, mainly because is wasn't very effective. Accordingly, it could take long time before they managed to catch one chiru in a tsedung, if they managed to catch one at all. There was no way of telling when the chiru that used the particular hole would come back.

Picture 7.2. Nomad demonstrating how to use a ponda (*bod mda'*).

Ponda (*bod mda'*) is the old traditional Tibetan flintlock rifle. It was used to hunt all of the wildlife present in the Aru basin, and was (and still is) the only means by which the nomads could kill/scare off wolves and bears. However, it is not very efficient: if a nomad came across a herd of chirus he would only be able to kill one animal with this rifle. After he fired his first shot, all the remaining animals would flee. The rest of the animals would be long gone before he had time to reload, since reloading usually takes about 3-5 minutes. The flintlock rifle is not very accurate, and it loses most of its power at some distance (Picture 7.2). However, it was the only weapon they could use for hunting wild yaks, which was not without danger. If they failed to kill the yak with the first shot, the yak would either run away or attack before they could reload. The nomads told me that wild yaks have been known to kill people because it survived the first shot. Tarba told me that he had once shot a wild yak, and when he opened the animal up he found a couple of bullets inside its stomach, showing how hard it was to kill these animals!

Picture 7.3. Parts of a tseka (*btsod bkag*)

Tseka *(btsod bkag)* is a trap made up of long lines of piled up dirt and stones, which are arranged so that they funnel the animals closer and closer together. At the end of the trap the nomads would dig holes, in which they put leg-hold traps, or a number of nomads would lay waiting with their flintlock rifles ready. The tseka (Picture 7.3) was used only to hunt chirus, and are directed at the antelope's migration patterns (the females migrate north in May to give birth). I observed a lot of old traps like this in the basin; I also came across one that the nomads claimed was over 1000 years old. The tsekas were used mainly during winter, except for the ones that were directed towards the female birth migration route in May.

The various wildlife species were also hunted in different seasons, with blue sheep and gazelle only hunted during February, chiru of both sexes hunted in winter and male chiru primarily during summer after the females have migrated north for calving. The kiang was hunted throughout the winter, even though it was not a preferred target for hunting.

Hunting has been a subsidiary occupation for the nomads in most of Tibet for a long time. Ekvall (1968:53) writes:

> "[…] in wide areas, still teeming with game, the nomads are enthusiastic hunters. They carry firearms at all times; the demands of pasturing takes them close to the haunts of the herbivores of the higher country; they hunt beasts of prey in order to protect their herds, and they are accustomed to taking life for meat and skin. It is most natural to turn to the herds of wild yaks, orongo antelope (chiru), wild sheep, and gazelle when meat is, or may be, scarce, and to hunt onager (kiang), wolf, fox, bear, and lynx for pelts, musk deer for its pods, and stag for antlers in-the-velvet, which bring high prices."

Ekvall (1968) also tells that there were entire communities that hunted wild yak, and subsided mostly on their meat during winter. He also claims that people, living in the north plains, were half huntsmen and half pastoralist, subsiding basically on chiru, and even

kiang, which other nomads consider not edible, but hunt for their skins. He (1964:53-4) writes:

> "Everywhere wild sheep and gazelle, as opportunity affords, are hunted for their meat and skins. Game animals take on flesh faster in the spring than domesticated stock and are full fleshed when domesticated sheep are still too thin to be worth the killing. The pastoralist eats their flesh with particular relish for it is both good and does not entail the sacrifice of any animals in his herd."

All this holds true for the Aru nomads, traditionally they have relied on hunting as a supplementary way of making a living, primarily because they were poor, and the opportunity to hunt could be a matter of life and death. As one Tarba said: "*When I was young we had no choice but to hunt, if I didn't hunt my family would starve and maybe die*". Also "*When my children were young they had to wear clothes made out of skins from wildlife. I was so poor that I couldn't afford to make clothes out of sheep and goat skins*." The nomads primarily hunted the chiru mainly to get extra meat, but also to trade the skins with people from Ladakh in India. The skins from the chiru were traded because of its very fine fur (shatoosh), a type of wool that is much finer than cashmere. According to Schaller (1998) skins from the chiru have been traded from Ladakh to Kashmir for a very long time. In Kashmir the fine shatoosh wool was woven into high quality shawls, something that have been a popular bridal gift for the Indian elite. Hunting of the chiru became even heavier in the end of the 80's and the beginning of the 90's with the opening up of Chinese borders and the closer presence of the market for sale of wool in the west, as I will return to later.

They also hunted wild yaks, from which they used the meat and made shoes of the skins. Blue sheep, Kiang and Tibetan gazelle were mainly hunted for meat. Some people also used the skins from blue sheep to decorate their dresses, and some monks bought the skins because they made good material for making drums. Hunting gave the Aru nomads an opportunity to get meat without cutting into their capital (i.e. animal). As such hunting was an effective way for them to diversify their subsistence base and reduce the risk of falling below a minimum subsistence level. On the other hand, hunting was also a means of reducing the effect of disasters, in that when livestock was lost due to e.g. a blizzard, they could compensate for this by hunting, and avoid cutting into the capital.

7.3 Herd Composition

> ”The species composition of herds, their structure, i.e. the sex- and age-ratios of the animals and the way in which the herding-animals are employed, are determined, first and foremost, by their biological particularities and natural geographical conditions. But also influential are economic, social, political and cultural factors, at best only loosely connected with the ecology.” (Khazanov, 1994:25).

The distribution of hoofed animals is subject to ecological constraints. For example, reindeer (*Rangifer tarandus*) can only successfully be herded in the tundra, camels in the desert, and yaks only in high altitude regions. However, the adaptability of sheep, goats, and to some extent horses and cattle are far greater, and for this reason the geographical distribution of sheep and goats is much wider (Khazanov, 1994). Sheep and goats are able to pasture in the same ecological zones, and they often graze together. But, as Khazanov (1994:27) notes:” […] the adaptive capacities of these animals [sheep and goats] are one thing, the economic expedience and effectiveness of herding them in specific ecological conditions are another.” Also, the herds are an instrument for exploiting the environment and tempering some of its fluctuations (Dyson-Hudson, 1980). According to White (1997:94) “pastoralists attempt to maintain a herd whose size and age/sex structure will enable them to withstand the vicissitudes of risky conditions.” Keeping multiple species can have some advantages: herds tend to be more stable, and permit a wider use of pasture. Also, if one species experiences great losses, another of the available species can, to some extent compensate for this loss, because the different species’ capacity to cope with different natural disasters, and reproductive ability, varies between different species (Khazanov, 1994). Also, species diversification reduces the danger of losing an entire herd from one disease (White, 1997). Multispecialisation can therefore be viewed as a risk reducing strategy.

Faced with the possibility of loosing large percentages of their herds, it is reasonable for the Aru nomads to keep sheep, goats and yaks, since they have a different tolerance with regards to snow, and snow related problems. For example, yaks can survive longer than sheep and goats when the grassland is covered by snow. Furthermore, according to the nomads a blizzard has to be of greater intensity to kill yak in the course of one night, than for sheep and goats.

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On the other hand, there are also economic advantages in keeping multiple animal species. For example, the amount of milk, and the duration of the milking season vary for the different species, and only dris gives milk all year round. Sheep usually have their lambs in January and goats have their kids in April, and it is thought to be important that lambs and kids have exclusive access to mother's milk during this early period of their lives, and the nomads postpone milking until the lambs and kids are old enough to almost exclusively sustain on grass. According to the nomads, lambs depend on mother's milk for a longer period of time (around five months) than goat kids (around 1 month). According to the Aru nomads' sheep can be milked for around three months, starting in early June and ending in late August. Goats provide the nomads with milk for almost six months, starting in May and ends roughly sometime in December. The duration of the milking season is also dependent on the general fitness of the animals. During harsh springs or bad early summers, animals sometimes have difficulty in finding enough grass. As a result, the animals' milk producing capacity is reduced, and nomads often postpone milking. However, because of the low numbers of yaks in Aru, the Aru nomads do not get much dri milk, and as a matter of fact, I never witnessed any nomads in the Aru basin milking their dris.

Although a single yak is worth much more than a single sheep or goat (traditionally, six sheep and seven goats were of equal value to one yak), the Aru nomads have few yaks, comprising only around 4 percent of the Aru nomad's totally number of livestock. This also holds true for the Phala nomads; yaks comprised just 12 percent of Phala nomad's livestock (Goldstein & Beall, 1990). Goldstein & Beall (1990) writes that this is probably due to the amount and quality of vegetation available. This is reflected in the changing composition of herds from the western parts of Tibet to the eastern parts, where the amount and quality of vegetation is better.

Miller (2000) concurs with Goldstein & Beall (1990) that vegetation is the most likely explanation for this differences. However, Miller (2000.) also argues that in Luqu the government has actively encouraged the nomads to raise sheep. Also, Manderscheid (2001) writes that in Dzamthang County (north-west of Sichuan province) the numbers of yaks decreased during collectivisation since state planners considered sheep and goats to be more productive than yaks. As such herd composition can be influenced by governmental policies.

Another explanation is also possible: since small stock (sheep and goats) have a faster reproductive rate than large stock (yak), the large percentage of small stock in the Aru nomads' herds can be connected to the constant risk of losing animals to e.g. blizzards and predators. Due to the higher ages of yaks at first calving, yaks reproduce slower than sheep and goats, in spite of being fertile for a longer period of time. Yaks can be said to be a more constant resource for the Aru nomads, but if a disaster reduces the majority of a yak herd, the herd takes a longer period to rebuild after the disaster, making it more advantageous for the Aru nomads to keep herds of sheep and goats.

The *age structure* of herds can also be viewed as being connected to risk. As Khazanov (1994) notes, a herd of domestic animals consists of much fewer old animals than a herd of wild herbivores. This also holds true of the nomads inhabiting the Aru basin. They clearly stated that they preferred to slaughter old animals, mainly because old animals have a lower reproductive value. An extreme example of this being their preference for slaughtering animals that are so old that they are not able to feed properly on grass, they actually have a term for these animals: *Kakang*, literally meaning "no teeth". The justification for killing animals that old for meat may seem strange, since the quality of the meat is not the best. However, this makes complete sense if we consider that nomadic pastoralists try to avoid selling or killing more animals than are added through birth, since it would be disastrous for a nomadic household to be in a position when there is a high mortality rate of newborn animals, and there is a need to eat parts of its capital, which in the end can lead to impoverishment. Death of newborns is especially disastrous, since it reduces the flow of new females into the herd. Very old animals are more vulnerable to climatic shocks such as blizzards and harsh winters. As a consequence old animals are more likely to die during winter than young ones. Also, since the Aru nomads claim they do not eat animals that die of natural causes, slaughtering them before winter makes sense.

7.4 Breeding

Breeding is a factor that influences the future quality of the products that the nomads rely on and as such can also be viewed as a risk reducing strategy.

Nomadic pastoralists in the Aru basin keep only a few male animals for reproductive purposes, all other male animals are castrated There are two main reasons for this: one

refers to the *control* of the herd, the other to *preferences for meat*. If every male were given the ability to be sexually active, there would be chaos in the herd, especially during the rutting season when males would constantly fight to gain access to the females. Therefore nomads having herds of around 200 animals usually have only 3 males that are able to reproduce, for a herd of less than 100 animals, two are enough. This applies to both sheep and goats. Since the nomads in Aru have few yaks, one household has normally only one male yak or none, which is able to reproduce. Households that possess male yaks that are reproductive, usually let households with no reproductive yaks take advantage of their own fertile yaks.

Also, nomads in Aru do not eat meat from male reproductive animals because the meat tastes badly and has a very bad smell. Castrations are therefore necessary to give the nomads a supply of preferable meat.

The Aru nomads use breeding strategies aimed at giving them products that are both reliable and of high quality. The decision concerning which male animals not be castrated is quite difficult to make and can be viewed as a particularly risky undertaking, since *whichever animals the nomads choose will make up the genetic pool for the future generations of sheep, goats and yaks*, i.e. all future animals will have some of their traits when they are born. Therefore male animals that are not castrated are carefully selected. However, sheep and goats are castrated at a very early age (sheep and goats when they are 3-4 months old), making it difficult to decide whether it will be a good animal or not, i.e. if it will have the traits that the nomads are searching for. The nomadic pastoralists in Aru therefore look at the qualities their mothers have, since the mothers' traits are indicative to what traits that will be passed on to the next generation (the father will most likely have the most desirable traits since it has been through this selection process before). The decision on which yak not to castrate is not that critical since yaks are usually castrated when they are 3-4 years old. If yaks are castrated earlier they won't grow up to be big and strong, traits that are preferred in yaks by the nomads.

In general, the Aru nomads look for the following qualities in the mothers of future possible reproductive male sheep and goats:

a. Size

b. Milk production
c. Colour of wool

Size of animals is critical for a number of reasons; firstly because size reflects the overall health of animals, big animals are healthier animals, and healthier animals are more resistant to harsh environments. Large animals also give more meat, wool and cashmere wool.

The amount of milk lactating animals give is also important, since nomads in Aru rely heavily on milk products during summer and autumn. Also, herds in Aru are relatively small, making it of paramount importance for them to have animals that give products of high quality, i.e. milk yields are high. Sheep wool and cashmere wool are more valuable if it is white, since white wool is easier dyed with other colours. This is true both for the nomads' own use, and for the prices they get on governmental markets.

The nomadic pastoralists in the Aru basin therefore prefer to keep male lamb and kids that are born by mothers that are large, produce more milk and have white wool reproductive.

7.5 Summary

Hunting can be viewed as a strategy of subsistence diversification on two levels. Firstly, the Aru nomads hunted so that they could reduce the capital off take of their herds, and thereby decrease the probability of falling below a minimum subsistence level if disaster struck. Secondly, hunting was also a means of reducing the effect of disasters, i.e. when livestock was lost due to e.g. a blizzard, they could compensate for this by hunting, and avoid cutting into the capital.

The keeping of multiple species can by explained as a strategy of decreasing risk on two levels. On the one hand different species have different tolerance to climatic hazards. On the other hand different species have different reproductive rates. While yaks can be said to be a more constant resource for the Aru nomads, they have a lower reproductive rate. Sheep and goats have a faster reproductive rate making it advantageous for the Aru nomads to have more sheep and goats, since if a disaster occurs a herd of sheep and goats will be rebuild faster than a herd of yaks. On the other hand, factors, such as governmental policies and economic considerations, also contribute to herd compositions.

Breeding can also be viewed as a risk reducing strategy, since breeding influences the future of the Aru nomads: by carefully selecting which animals that are left to breed, the Aru nomads make sure that the future livestock products will be of the best possible quality.

Chapter Eight: Household Viability and The Problem of Labour

8.1 Introduction

Göbel's (1997:41) suggests that bottlenecks in the availability of the work force, has to be considered as a risk factor in pastoral production systems.

The availability of labour is of major importance to nomadic pastoralists. The number of people in a household both plays a part in the optimal care and control of the herd, and also the optimal exploitation of the animals. This is connected to Stenning's (1958) term: *family development*. The number of personnel, consumers and producers in a pastoral nomadic household will change throughout a household's lifetime, i.e. family development refers to cyclical changes in the size and composition of viable domestic units. Stenning (1958:92) writes:

> "These are changes brought about by the birth, marriage and, death of family members. They involve not merely changes in family constitution, but affect, and are affected by, the relation between the family and its means of subsistence, which, as a domestic unit, it manages, exploits and consumes in close co-residence, continuous co-operation, and commensality. Such a domestic unit is viable when the labour it can provide is suitable for the exploitation of its means of subsistence, while the latter is adequate for the support of the members of the domestic unit."

Newly established households and households where members have recently either died or moved out, are most in need of extra labour to successfully exploit its means of subsistence. In other words, it is important to keep up *the pastoral household viability*, i.e.

> "When the size and increase of the herd is adequate for the subsistence of the family and the size and composition of the family are suitable for the control and deployment of the herd, then family and herd may be said to be in equilibrium and the unit as a whole is viable […] "(Stenning, 1959:100)

However, a household's need of labour does not only depend on where it is in its life cycle, but also on changes throughout *seasons*.

8.2 Commensurability

The problem of labour can also be discussed in relation to Robert Paine's (1972 & 1994) herd management model. The model describes what he calls the commensurate proportions of herd management. These commensurate proportions are: *herds*, *personnel* and *pasture*[28]. These are what Paine (1972 & 1994) refers to as the three factors of pastoral production. He goes on to write:

> "*A prerequisite of viable herd management is the possession of three assets in commensurate proportions: herd, partners, and pasture.*" (Paine, 1994:103)

These factors are commensurate in the understanding that changes in one affect at least one of the other. Nomadic pastoralists strive towards getting these assets in commensurate proportions, for example an increase in herd size will demand a larger pasture and more personnel to herd the animals. Failure to reach commensurability results in difficulties for the pastoralist, for example, for the Sami in northern Norway in recent year the herds have continued to increase whereas pastures have been constant or actually diminished (Paine, 1994). Also large herds, without sufficient manpower available to herd them, will probably suffer continuous depletion of the herd. If the pasture is insufficient for large herds, people that would otherwise want to stay together may have to split up. From this we can describe the ideal proportions of herd management as those of an equilateral triangle (Fig. 8.1).

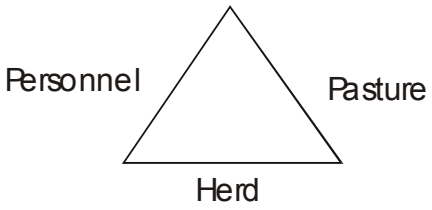


Figure 8.1. Herd management of commensurate proportions. Adopted from Paine (1994:104).

As Paine (1994:103-104) writes:

[28] However, as Paine (1972:78, footnote 1) writes: "Access to water as well as pasture, must probably be included as a prerequisite of herd management outside the northern regions." However, as with the northern regions, water doesn't seem to be a critical resource in the Aru basin.

> "Whether or not this model is attained, by referring to it while studying conditions, we may be better able to grasp the kind of arrangements pastoralists hope to have, or must have, if they are to continue as pastoralists."

Incommensurable proportions between individual households' personnel and its animals with regard to labour can be illustrated as in figure 8.2: According to Stenning (1959) words, this household is 'unviable'.

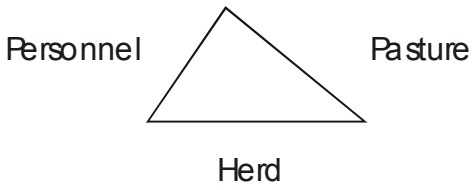


Figure 8.2. Incommensurate proportions between personnel and herd.

On the other hand, if a household has too few animals, the number of consumer and the herd on which they rely on, becomes incommensurable. (Fig. 8.3) Also, small herds tend to break up giving herders a problem regarding *control*. By joining other households with small herds in the daily herding, a larger and more controllable herd can be made.

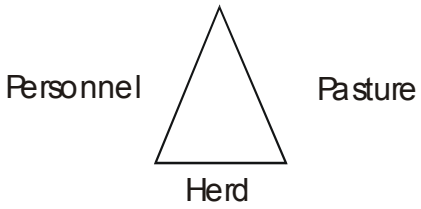


Figure 8.3. Incommensurability between herd and personnel.

8.3 Optimal Herd Management

The best possible management of animals requires that the herd is separated according to species and age and into dry and milk herds (White, 1997). Different categories have different grazing needs and capacity for mobility. Young animals often have difficulties in following the herd, and are at very young age kept close to the household's tent, and often also within the tent. If brought out to graze too early, lamb and kids can easily be lost. According to the Aru nomads, young animals have difficulties in keeping the same speed as adult animals, and tire easily. If the herders do not keep a watchful eye, he/she can easily lose a lamb or kid who has settled down to sleep. Also lactating animals need good quality forage, and pregnant, lactating and young animals need more feed than dry females

and adult males. Optimally the nomads should split their herds according to the animals' needs, which is impossible if there is a shortage of work force.

One way to decrease risk of labour availability and to attain commensurability between personnel and herd, without increasing the numbers of consumers, is for several households to go together and form units that herd their animals together, which I will call *herding groups*. A herding group is defined as a unit that shares responsibilities for the daily herding of its members' animals. A herding group therefore consists of animals from several households. However, households that herd their animals alone can also be referred to as a herding group, since the term 'herding group' refers to Paine's (1964) definition of "herding" as a part of herd management.

8.4 The Formation of Herding Groups

8.4a Herding Groups: A Description

Although 13 households lived together in September 2000 they did not all herd theirs individually; instead they were separated into 6 herding groups (Table 8.1).

Table 8.1. Distribution of people and animals into different herding groups, Kontrok Tsho chung, Rutok xian, September/October 2000

Group	Sheep & Goats	Households	People	People in workable age
1	698	3	13	11
2	220	2	7	4
3	266	1	6	3
4	325	2	5	3
5	475	2	2	6
6	431	1	9	6

Table 8.1 shows the distribution of people, animals and households into different herding groups during September/October 2000, for Kontrok Tsho chung. As previously mentioned, 2 households from this group were at this time living at the Gertse side of the basin.

Herding Group 1 consists of individuals and animals from three households, namely Tsering, Dondrup and Chamba (Figure 8.4).

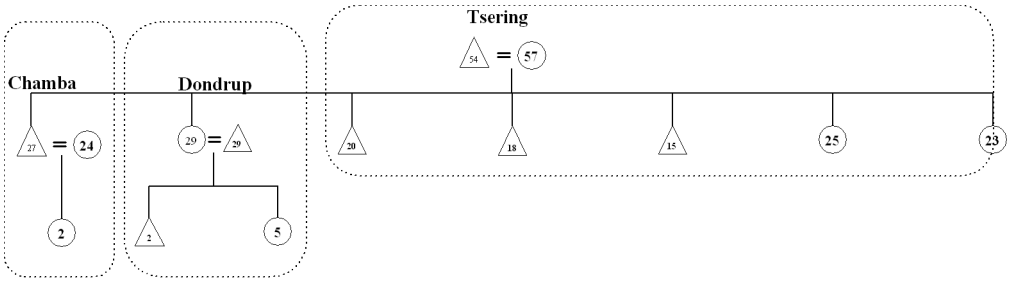


Figure 8.4. Showing the kinship relation for Herding Group 1, and age for the different individuals in the group. Stipulated lines indicate households.

In other words, Herding Group 1 consists of individuals from the original household (Tsering) and one son (Chamba is Tsering's son) and one daughter (Dondrup is married to Tsering's daughter). Consequently, Herding Group 1 is based on close kinship ties, i.e. it is based on a father-son/daughter constellation (Figure 8.1). Another factor is the age of the households in question, e.g. Chamba's household is newly established, since he has been married for only 2 years. As a consequence this household has few animals and a low workforce since children usually start to herd when they 7-8 years old (regardless of sex). Herding Group 6 also consists of such a formation, Dramdwei and his son Pemba, who has been married for only 1 year and has no children (Figure 8.5).

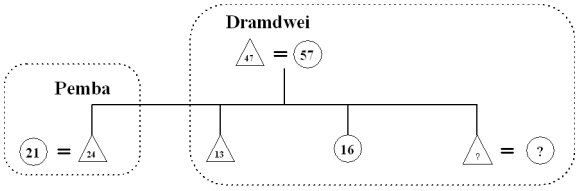


Figure 8.5. Showing the kinship relation for Herding Group 6, and age for the different individuals in the group. Stipulated lines indicate households.

Also Herding Group 5 consists of a single woman and her children, together with one married daughter and husband. They have been married for 3 years, and have no children (Figure 8.6).

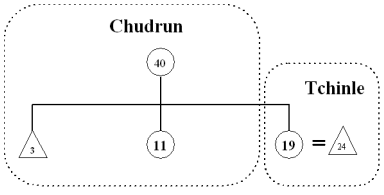


Figure 8.6. Showing the kinship relation for Herding Group 5, and age for the different individuals in the group. Stipulated lines indicate households.

The common factors here are that the herding groups for Kontrok Tsho chung to a large extent are based on kinship, and are usually made up of newly established households and their respective households of origin. Newly established households tend to have few animals (do not start out with many animals) and low workforce (newborn children are years away from "herding age"). Together with another household or two, their combined animals can make up a herd of manageable size and a relatively large workforce is available. The only herding groups that do not fit into this pattern are number 2 and 3. Herding Group 2 is made up of Chung Tsering and his brother's (Tsering) son, Gangtso (Figure 8.7). For them, no such father–son/daughter herding group constellation is available: Chung Tsering's father, Tarba, is too old to help with the herding, and Gangtso's father is already in such a constellation with his newly wed son. However, each household in Herding Group 2 have relatively few animals (Table 8.1), and according to the Aru nomads a herd of around 200 animals are easier to herd than two of 100 animals. Also, individually, each household have two-three persons available herding, making it preferable to herd together than alone (Figure 8.7).

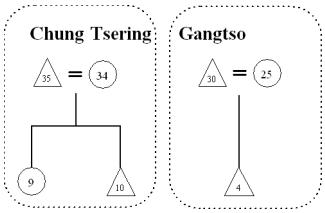


Figure 8.7. Showing the kinship relation for Herding Group 2, and age for the different individuals in the group. Stipulated lines indicate households.

However, if herding groups consist of father–son/daughter constellations, the only possibility open for Herding Group 3, is with Tsering, since he is married to Kelsang's daughter from a previous marriage. Tsering is already in such a constellation with his son Chamba. As a consequence this herding group usually herd their animals alone (Figure 8.8), although sometimes other households give a helping hand.

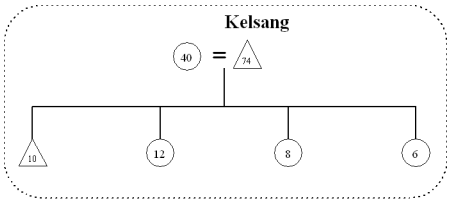


Figure 8.8. Showing the kinship relation for Herding Group 3, and age for the different individuals in the group. Stipulated lines indicate households.

However, the availability of labour is also influenced by seasonal variations in labour need. The demand for labour is at its highest during late spring and summer time since this is the time of milking, wool shearing and lamb and kids need careful watching. Not surprisingly, the Aru nomads join in herding responsibilities during summer time, while in wintertime animals are usually herded individually.

8.4b Herding Groups Reduces Risk

According to Tsering they share herding responsibilities because:

> "*We are very poor and have few animals. A herd of few animals is much more difficult to look after than a herd of good size. Also, some tents have many old and young people and have therefore many difficulties in their daily herding. Therefore we help each with looking after the animals.*"

The formation of herding groups is therefore related to availability of labour and number of animals, where if households have few people able to work, sharing, i.e. *exchanging* labour, the daily workloads with another household can help out with the situation. Also, sharing herding responsibilities between households, gives individual households means and time to do other labour required activities: for example four households from Gertse xian during October 2000 were divided into two herding groups. They shared herding responsibilities because it would free members of the individual households to work on an animal corral on the other side of Aru tso.

Consequently households that cannot provide enough labour to maintain the herd and engage in other subsistence activities are in trouble. For example, several nomads from Gertse asked me if I had seen their yaks, since:

"*We do not have enough people to herd our yaks. Therefore we do not know exactly where they are anymore. Sometimes when we find them they have almost become wild, since they often live with the wild yaks in the mountains*."

However, this is not a problem related to yaks only, almost all nomads from Rutok xian (Kontrok Tsho chung) arrived in the Aru basin in 1991 with horses. Today there are no horses left since they were left to graze alone, and have become an easy prey for wolves.

Also, households with relatively few animals are better off herding with other households since it is easier to herd a relatively large group of animals than a smaller one. Small groups tend to break up with animals grazing far away from each other, and consequently making them an easy prey for predators. By joining another herd a household in this situation can regain control over its herd. Therefore, it is possible to argue that the formation of herding groups is a strategy the nomads use to reduce risk involved in herding animals: low numbers of animals herded give the herder a problem of *control*, and can result in the loss of animals due to predation or animals simply getting lost. On the other hand, low workforce increase risk by not making it possible for members to pursue other subsistence activities and giving the herd necessary care.

8.4c Large Herds Increases Risk

Although herding groups are formed both because of labour shortages and low animal numbers, the nomads also have an understanding of the risk involved in having several large herds grazing in the same grazing area. This is especially important during the summer months, when the animals have to store up fat reserves. If too many animals graze together, the amount of grass available to each individual animal decreases, which again can have a negative effect on the animals' chance of survival during winter.

This is clearly illustrated when we looked at Herding Group 6 in table 8.1. This household's grazing pattern puzzled me for quite some time, since they never herded their animals with other households, and almost never put up their tent close to other tents. This household is also quite large, consisting of 2 adults and 7 kids of whom only 3 were of young age, making 6 persons available for herding (Figure 8.9).

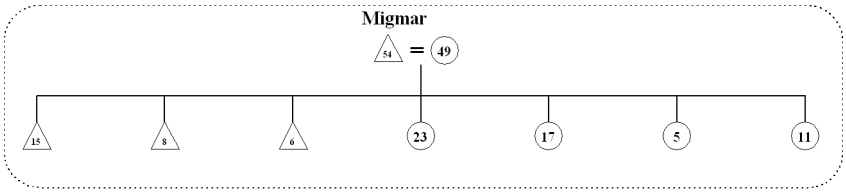


Figure 8.9. Showing the kinship relation for Herding Group 2, and age for the different individuals in the group. Stipulated lines indicate households.

Consequently, this household has no need for help in the daily herding activities of their 430 sheep and goats, i.e. there is no demand for extra labour. Viewed from another perspective, it makes sense for them to herd their animals alone, since any additional animals can have a negative effect on their animals' access to grass, which again can affect their chances of survival during winter. However, it is also reasonable to other households not to herd together with this household for the exact same reasons, making herding group formation between relatively "rich" households and relatively "poor" households unprofitable for both parties.

8.4d Herd Splitting: Optimal Grazing Pattern

Optimally the nomads should split their herds according to the animals needs. Nevertheless, this is rarely done in Aru, basically because this kind of herding requires a large amount of labour. The only herding group I saw splitting up their herd was Herding Group 1. They did so because, as previously mentioned, the best possible management of animals requires that the herd is separated according to species and age and into dry and milk herds (White, 1997). Herding Group 1 separated their herd according to lactating females and adult males, and thereby herded two separate herds. However, as they said:

> "*This is only a rough separation since there is both lactating females and males in both herds, but since we herd two small herds instead of one big herd it gives the females better and more grass than if they all were herded together*."

Young animals are usually kept separated from their mothers when they are old enough to live of grass alone to prevent from drinking mother's milk.

Goldstein & Beall (1990) describe such herd splitting among the Phala nomads. They split up their herds to take more advantage of the grassland, and also to accommodate the

specific needs of the different species. For example, yaks are usually herded higher up in the mountains than sheep and goats during winter. The nomads establish so-called satellite camps, called *kabrang*, usually inhabited by family members or hired hands. The raison d'etre for this in the words of one of Goldstein and Beall's (1990:61) informants, is:

> "[…] Yak, unlike sheep and goats, are able to bite off grass and to lick/pull up with their tongues. Thus, in winter they have no trouble consuming the low-lying bang [A type of sedge in the kobresia family]."

Yaks are more impervious to cold than sheep and goats, making grazing at higher altitudes easier. However, households in the Aru basin have generally few yaks, and usually all of the yaks from one campsite are herded together, since this saves labour for individual households

8.5 Summary

As explained, the nomads in the Aru basin go together in so-called *herding groups*. Usually a herding group consists of 2-3 households, which share the responsibility for the daily herding. The formation of herding groups both makes the daily herding easier and is labour saving for the individual households. In other words, by joining other households in herding activities the Aru nomads attains commensurability between herd and personnel with regards to labour, *without increasing the numbers of consumers*. Individual households also attain viability, since member without herding responsibilities can pursue other necessary activities. The formation of herding groups can be viewed as risk reducing strategy, since, with regard to control, it decreases the probability of being attacked by wolves. By carefully considering the need of their animals, the nomads can split their herds and provide more grass for each individual animal, which again increases individual animals' chances of survival during a harsh winter.

Although we must keep in mind that the actual herding groups probably change during time, the underlying rationale, i.e. labour saving and increased herd control, for forming herding groups probably remains the same. This will be even more important in the years to come, since each household now is supposed to send at least one child to school, and thereby putting increased strain on an already critical labour situation for this group.

Although most nomads are positive to this, and feel that education is the way of the future, they still have reservations. As Tsering said:

> "*School is very good, since it gives our children a chance of getting an education. This could possible give them a job in a xiang, and give them a lot of respect from other nomads. However, what happens if our children do not do well in school? Not only will they not get a job in a xiang, they will also become unsuccessful nomads since they will not have had enough training to become successful nomads*."

9.1 Introduction

Mobility has been explained differently throughout the study of nomads. Evans-Pritchard (1940) used a structural-functionalistic framework and viewed mobility as a rational response to seasonal changes in the environment. This was also the case with Stenning (1957 & 1959) and Dyson-Hudson (1966). Mobility has also been studied on different levels roughly separated into population level (e.g. Stenning, 1957) and the level of individual herd owners (e.g. Dyson-Hudson & Dyson-Hudson, 1969). While patterns are easily found on the population level, movements are found to be both unpredictable and variable on individual herd owners' level. However, both use ecological explanations for movement. According to McCabe (1994) in the late 1960s and early 1970s ecological explanations for mobility were viewed as being too deterministic. Studies in the Middle East had suggested that mobility was better understood as a response to political events. Also, focus was set on social factors (e.g. Gulliver, 1975 & Woodburn, 1972). Finally, McCabe (1994) argues that decisions regarding mobility probably have to take into account all of these factors.

In the late 1970's and early 1980's researchers were concerned with the failure of pastoral economics, e.g. witnessed by dramatic impacts of droughts in Africa. For example, Lamprey (1983:656) writes:

> "In balance it seems that the symbiosis of pastoral man and his domestic animals has been very successful if viewed as a survival strategy in the short term. In the long term it appears less successful since it tends to destroy its own habitat."

This view still lingers on, e.g. mobility lead governments to look at pastoralism as 'backward', lacking the technological level and skill to successfully get the most out of their existing adaptation. Thus, in many areas of the world including the PRC, large governmental sedentarisation programmes have been established to raise the technological level, and to enhance the profit of pastoral production (Goldstein & Beall, 1990; Humphrey & Sneath, 1999; Galaty & Salzman, 1981), although this seems to contradict

findings from Mongolia, where sedentarisation and a decrease in mobility has led to grassland degradation (Humphrey & Sneath, 1999).

9.2 Herd and Pasture: Commensurability

Following Paine (1972 & 1994) nomads try to attain commensurate proportion between personnel, herd and pasture. As a consequence they have to move and settle according to a system that takes into account the heterogeneity of their grazing area: whereas one grazing area might have much grass and can sustain many animals, other areas do not. In other words, movement patterns have to take advantage of the spatial and temporal structure of resource distribution. If an area cannot sustain the number of animals grazing on it, incommensurability between pasture and herds will be the result (Figure 9.1), and possible have detrimental effects on animals' welfare, i.e. the risk of losing animals will increase.

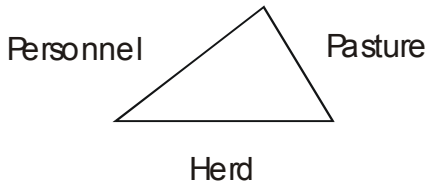


Figure 9.1. Incommensurate proportions between pasture and herd.

Settlement patterns can be viewed as chosen in order to attain commensurate proportions between animal numbers and pasture (Figure 9.1). Consequently, knowledge and information about environmental variability is of uttermost importance.

Although the Aru nomads are organised into 'small groups' (tsho chungs), this does not mean that all the households within a 'small group' (tsho chung) live close to each other. Instead they group themselves into camps of different sizes relative to the amount and quality of grass at any given place. This chapter therefore deals with *how the nomads move and organises spatially*. In other words, I will describe the underlying process of camp formation and movement patterns.

9.3 The Establishment of Different Grazing Areas

Goldstein & Beall (1990:60) describes the seasonal movement patterns of the Phala nomads:

Mobility: Optimal Use of Grazing Areas

> "[…], the Phala nomads move between two encampments - a main home-base three season encampment used in winter, spring and summer, and a fall encampment. In late August or early to mid-September they make their major migration, leaving their home base for pastures areas usually one- to two-days' walk away which have been left ungrazed all season. The nomads reside at these fall encampments (which are re-occupied year after year) until late December when the forage is just about exhausted. Then they return with their sheep and goats to their original home base encampment and use the remaining vegetation until the next growing season."

The seasonal movement pattern for the Aru nomads is different from that described for the Phala nomads. The Aru nomads do not have, what Goldstein & Beall (1990) call a two-part migration system, i.e. a home-base encampment and a autumn encampment. There does not seem to be a home-base encampment in the way that Goldstein & Beall (1990) describe it. For the Phala nomads, the home-base encampment is located close to good sources of water, and is usually occupied for eight to nine months during winter, spring and summer (Goldstein & Beall, 1990:62). During this time, households often move their tents a couple of hundred meters once or twice, mostly to accommodate shifting wind directions. Also, Goldstein & Beall (1990) write that there are from two to nine tents that share a home-base encampment, sometimes living close together and at other times living more dispersed. Home-base encampments, because of their stable nature (nomads expects to live in the same place year after year), often contain some improvements, e.g. wind breaking walls made from stone, storerooms and one-room houses (Goldstein & Beall, 1990:62).

In Aru, the only place that resembles this description is where they have set up winter houses. However, the nomads stay in their winter houses only during winter grazing, from early December until late May or early June. The winter houses are located more dispersed than what Goldstein & Beall's (1990) describe for the home-base encampments, never more than two or three located side by side. The Aru nomads seem to be moving more frequently than the Phala nomads, in the sense that they rarely establish satellite campsites, instead the whole household moves. To explain this I have to look at how the nomads have divided their grazing areas and how they actually move between them.

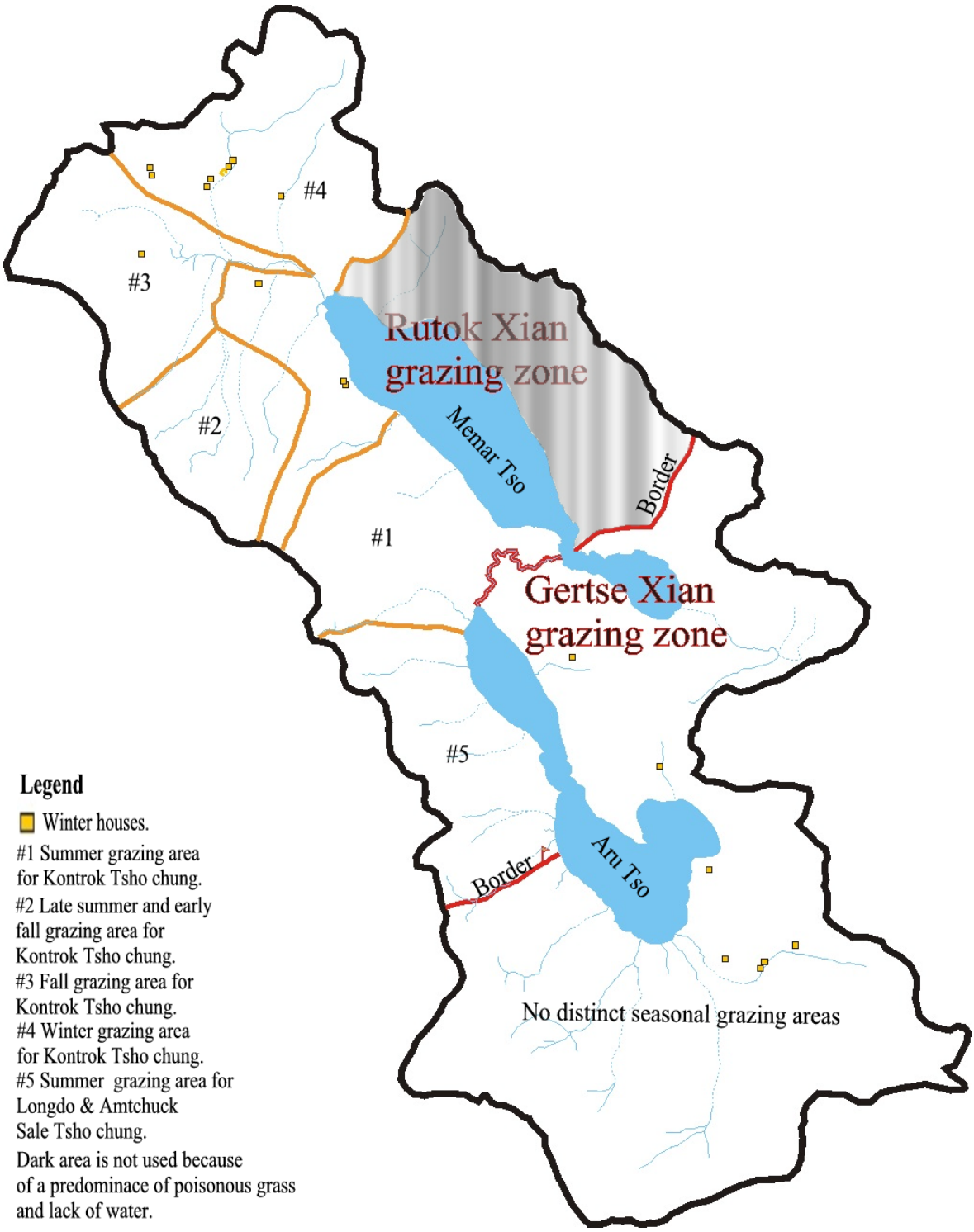
9.4 Different Grazing Zones in the Aru Basin

There is a difference in how the nomads from Gertse and those from Rutok Xian have divided their total available grazing area, partly due to difference in the level of control enforced from local town centre (xiangs) and partly due to different ideas that the nomads have concerning the separation of their areas into different grazing areas. On the other hand, what is common for both Gertse and Rutok is that it was the individual nomads that through discussions decided where to have summer/, winter/ and autumn grazing areas.

For example, Kontrok Tsho chung from Rutok xian has divided their grazing area into four zones (Map 9.1). Grazing area #1 is part of this group's summer pasture, combined with area #2 which is used during late summer and early autumn. The nomads in this group usually move to their summer grazing area in the end of May or beginning of June, depending on the weather. The better the weather, the earlier they move. Area #3 is their autumn grazing area, together with an area on the north side of the mountains surrounding the basin. The moving to area #3 is usually made in the end of October/ beginning of November. Which households that move over the mountains, is decided on the basis of labour availability. Households, with a small labour force (households consisting of mostly small children and old people) usually stay in the basin, since crossing is hard and labour demanding. Area #4 is used for winter grazing and this area also has winter houses for this group. They usually move to their winter grazing area in the beginning of December. The area marked #5 on Map 9.1 is divided between Longdo Tsho chung and Amtchuck Sale Tsho chung and is only used for 3 months during summer. As seen on Map 9.1, no clear seasonal boundaries exist between different grazing areas for Gertse xian, although winter grazing is usually commenced in the proximity of their winter houses. However, according to Lhakchung from Gertse xian:

> "*We do not have marked boundaries between for example winter grazing and summer grazing since this would only lead to conflict. If for example one nomad crossed with his animals over to the winter grazing area in summer, all the other nomads would complain. Now nobody knows exactly where the boundary is, and therefore nobody can complain*."

Even though the boundaries between the different grazing areas for Kontrok Tsho chung are clear (marked with stones), they are only ideal, and crossing from e.g. summer grazing area to winter grazing area sometimes occurs.



Map 9.1. Showing the different seasonal grazing areas in the Aru Basin. Red lines indicate border between Rutok and Gertse xian.

9.5 Moving

Moving usually starts in early morning before the sun rises, and it is done in two stages: first, moving the animals and then moving of tents. The animals are carefully herded in the direction of the new settlement. Although, it might not be very far, moving animals take a whole day, since it is a question of giving them time to graze along the way. Left in the encampment is the rest of the household, and they start moving by dismantling the tent. The winter tents are black and are made locally from long strips of home woven yak-hair cloth. Each tent consists of two separate parts, identical in size, that are connected at the top by two short lengths of rope and toggles that loop over a wooden cross pole supported by front and back wood pillars inside the tent. There is a long open space on the top of the tent that allows the smoke from the tent-fire to exit. This hole can easily be closed with a flap when it snows. The tents are kept upright by external poles and guy lines, and the sides of the tent are fastened to the ground by metal spikes, or sometimes by horns from the chiru. The dismantling of the tent starts by taking down the poles on the outside and inside of the tent, and the removal of the spikes that secure the tent to the ground. Then the two halves of the tent are dismantled and packed in two big and heavy rolls. With the tent gone, packing the belongings inside the tent is easy, and takes maybe from half an hour to one hour. The last things to be packed are the ovens that are used for cooking, the teakettle and a churner, and often I witnessed a halt in the packing due to making of butter tea.

9.6 Settlement Patterns

9.6a June 2000

During our first fieldtrip in 2000 we arrived in the Aru basin at the 13th of June and set up camp at Campsite 1 on the Rutok side of the basin. At this time eleven households were located at this campsite and 4 at Campsite 2 (Map 9.2). We took daily trips visiting the other campsites. Campsite 5, 6, 7 and 8 refer to camps of nomads from Longdo Tsho chung, while Campsite 3 and 4 refer to camps from Amtchuck Sale Tsho chung. Each campsite from Longdo Tsho chung consisted of four households, but Campsite 5 and 6 refer to the settlement pattern for Longdo Tsho chung at our arrival, while Campsite 7 and 8 refer to their movement during our stay, so the total number of households was never more than eight for this group. From Amtchuck Sale Tsho chung, eleven households were located at Campsite 3 and 2 on Campsite 4. Although there were, during our stay,

households from Gertse xian present in the basin, I never had time to visit them and therefore their settlement patterns are unknown for this period.

June 2000

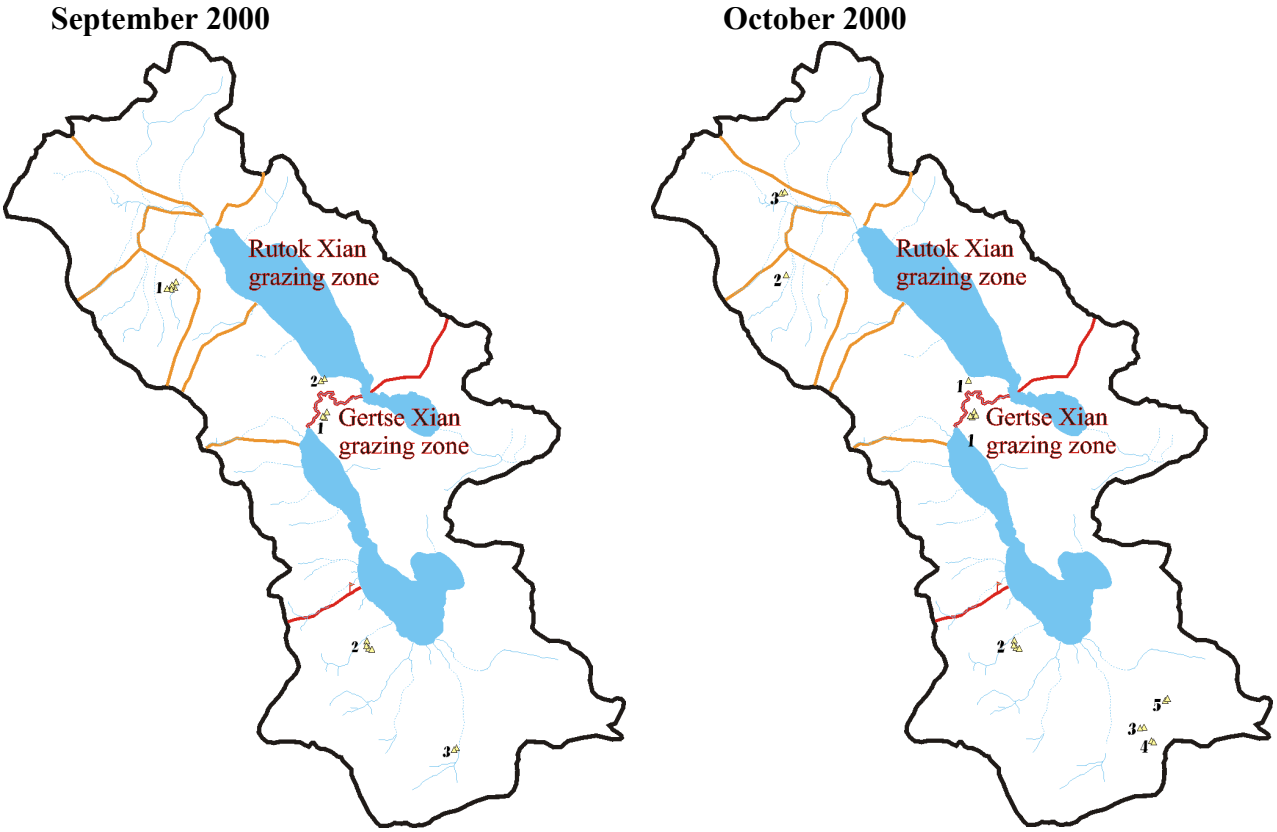
Map 9.2. Showing the different campsites within the Aru basin June 2000.

9.6b September/October 2000

During our second fieldtrip in September/October 2000, twelve of the fifteen households from Kontrok Tsho chung, Rutok Xian, were living in the same area, at Campsite 1. (Map 9.3, September 2000, number 1). Two households were, during our visit in the basin; living with relatives on the Gertse side of the basin (number 2 on Map 9.3, Gertse xian), and the last household herded its animals at the southeastern parts of Memar tso, together with another household who belong to Gertse xian, (Map 8.3, camp site 2, Rutok xian September 2000). Campsite 1 is within Kontrok Tsho chungs late summer or early autumn grazing area (Map 9.1, #2), and they arrived at this location around the 17th of September. They left for the autumn grazing area on the 2nd and 3rd of October (Map 9.1, #3). Arriving in the autumn grazing area, the nomads from Kontrok Tsho chung settled into a pattern of many small camps. However, since we also moved to a different part of the basin at this

time, I do not know the detailed locations regarding this settlement pattern, although tents were put up further away from each other than at Campsite 1, both because grass was scarce here and also because this was the last period before winter for animals to store up on their fat reserves. It was therefore important that each individual household's animals were given the best possible opportunity to get enough grass.

When we arrived in the Aru basin in September 14th 2000 we put up camp on the southeastern side of the basin (in the Gertse portion of the basin) although no nomads were present at this location during this time. We encountered the first nomads from Gertse xian on September 17th; two households had put up tents on Campsite 1 (Map 9.3, September 2000). However, we continued southwest along Aru tso and put up our first camp close to Campsite 2 (Map 9.3, September 2000). There were five households located at this position, although two of the households were from Rutok xian and were only here visiting their relatives. Later they joined the rest of the nomads from Kontrok Tsho chung when they moved to their autumn grazing (Map 9.1, #3) areas on the 2nd and 3rd October. On the 5th of October we put up camp on the Gertse side of the basin again, this time we camped at Campsite 1 (Map 9.3, October 2000) together with three households from Gertse xian. Later, the household that was located on the Rutok side of the basin in September (Map 9.3, September 2000, Campsite 2), joined this camp making the total number of households living here four. Accordingly, these four households only live within the basin for one month annually and will not be discussed here. During the 10th of October we put up camp between Campsite 3 and 4, each containing two households. The same was the case for Campsite 5, which was the residence for one of the leaders for the groups using the Aru basin (Map 9.3, October 2000). Accordingly, the nomads in these three campsites lived like this since they were in the process of building a corral for their animals on the other side of the Aru basin. Therefore they had arranged that people from one household from each campsite worked with the corral, while the households left in each camp had the responsibility for herding their animals.



Map 9.3. Showing the different campsites within the Aru basin September/October 2000.

9.6c May/June 2001

During the third fieldtrip we arrived in the Aru basin on the 23rd of May. We entered the basin from the southeast and put up camp at the southeastern end of Aru tso, Campsite 1 on Map 9.4 (May 2001, Gertse xian). At this location there were three households, and they arrived at this place around 1st of May. On the 27th, we moved to the Rutok side of the basin and put up camp close to Campsite number 1 on Map 9.4 (May 2001, Rutok xian), in Kontrok Tsho chung*s* grazing area. At this site only one household resided, and they soon moved to Campsite number 2 (Map 9.4, June 2001). During the 28th of June we took a daytrip down on the western side of Aru tso and encountered three tents form Amtchuck Sale Tsho chung (Map 9.4, Campsite 1, June 2001). Accordingly these three tents were the only ones to arrive in the basin so far, since bad weather had made the road from Rutok into the basin impossible to pass. However, by June tents from both Amtchuck Sale and Longdo Tsho chung had arrived, but lack of time and bad roads hindered me visiting them, and detailed information concerning their settlement patterns is therefore lacking (Map 9.4, June 2000, Campsite 1).

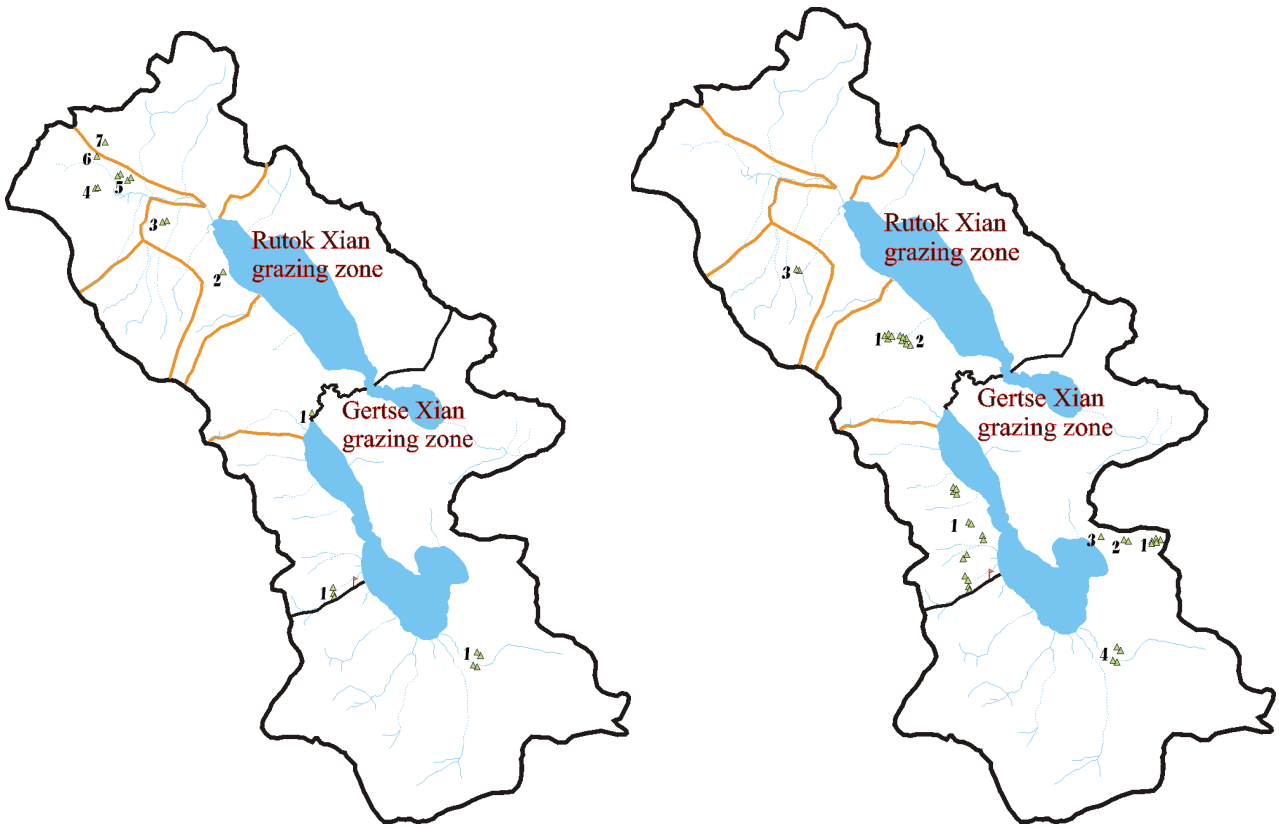
On the 29th of May, we moved on to Campsite number 3 (Map 9.4, May 2001). At this location only two households resided, but since one of the nomads that I had been in touch with previously resided here, this would be a good place to camp. During this period the nomads from Kontrok Tsho chung lived quite separately, with one household at Campsite number 2, two households at Campsite 3, two at site 4, four at Campsite 5, one at Campsite 6 and finally one household still resided within their winter house, marked as site 7 on Map 9.4, May 2001. As seen on Map 9.4 (May 2001) most of the nomads from Kontrok Tsho chung lived within, or close by, the winter grazing area. On the 9th of June the nomads moved to summer grazing, after several days of postponing because of snow.

Now, more households chose to put up camps closer together, for example campsite 1 (Map 9.4, June 2001) consisted of 6 households. A camp consisting of several households is usually organised so that tents are put up side by side, with only 10-20 m between them. This makes the camps relatively small, and in this instance the distance between the tents furthest away from each other was no more than 150-200 m.

At the same time, seven households from this group put up their tents a couple of km southeast of camp number one, behind a hill, taking the advantage of the grazing area to the southeast of their camp, towards the shore of Memar tso (Map 9.4, Campsite 2, June 2001). Although both Camp 1 and 2 were located relatively close to each other, it was not possible for all of the households to put up their tents at one of these two camps, neither could support for all of their animals. Also, two households put up their tents at the same place as Campsite 1 during September (Campsite 3 on Map 9.4, June 2001). This was probably a gamble since this campsite is located close to the mountains and is often influenced by heavy snow.

As for the Gertse side of the basin during June 2001, six households resided at Campsite 1, two households at Campsite 2, 1 at Campsite 3 and three households still resided at the same campsite (1 in June and 4 in May) as in May (Map 9.4, June 2001).

May 2001 **June 2001**



Map 9.4. Showing the different campsites within the Aru basin May/June 2001.

9.7 Seasonal Movement

The most probable reason why the Aru nomads have seasonal different grazing areas is connected to the growth season on the rangeland. The Aru nomads rear their livestock under a 'natural' system of pastoral production, i.e. their livestock is not given any additional fodder, they survive by grazing on range forage alone. Because of the high altitude in the Aru (and the rest of the Chang Tang plateau), the growing season is relatively short, starting in late April or early May, and ending in mid-September (Goldstein & Beall, 1990).

This has consequences for their movement patterns, since almost all areas in Tibet have roughly the same single growing season, i.e. there are no areas where grass grows during winter, so there is no need undertaking long migrations. As a matter of fact, they try to minimize travel, saying that it weakens the livestock and increases mortality.

As a result, livestock in the Chang Tang region has to forage for eight to nine months on dead plants left standing at the end of the growing season. A crucial factor for the livestock is that the amount of vegetation left by the end of summer, must sustain them until next year's growth begins (Goldstein & Beall, 1990). Or with Dorje's, one of Goldstein & Beall's (1990:60) informants, words:

> "The animals can survive in summer (and fall), […] even if the rainfall is poor, but unless there is enough grazing for them to build up stores of fat, many will not survive the harsh winter eating the poor fodder."

This seasonal migration pattern extends the good grazing season by three or four months and helps building up the fat reserves the livestock needs before winter sets in. As a consequence the nomads of Tibet cannot be said to be seasonal with regard to the common understanding of seasonality, i.e. taking advantage of an area's different growing season and moving accordingly. However, they are seasonal in the sense that they use different areas of relatively equal quality during different seasons.

This of course places much importance on the seasonal areas since the total available area is heterogeneous with regard to both quality and amount of grass, and climatic factors such as snow. As a consequence, the Aru nomads' knowledge regarding climatic variations, quality and amount of grass within their total available grazing area was made as a base for the division into seasonal grazing areas. It would be of no use to them to have their winter grazing area, in a place that is affected by heavy snowfalls during winter. Also, an area has to have at least some good quality grass, since the amount of grass is of no use if the animals cannot eat it. An example is the area on the northwest side of Memar tso, marked by a darker colour on Map 9.1, which has much poisonous grass (*tom*), making this area useless the nomads as pasture.

As mentioned, the nomads usually move from winter grazing to summer grazing in the end of May or in the beginning of June depending on weather conditions. The Aru nomads from Rutok xian experienced a particular bad winter and spring in 2001, keeping them from moving to summer grazing in the end of May. At this time most of them had moved from their winter houses, and all of the campsites were located some distance away from the mountains, away from the most snow-affected areas. As a result of this bad winter and

spring, the nomads had to live with a relatively large distance between them because of the shortage of grass, i.e. large herds would have had too much difficulty with finding enough grass.

Movement patterns between different seasonal grazing areas emerges then as quite predictable, since the areas, at least for Rutok xian, is relatively clearly marked, and also because they have to stay within these areas at specific times according to local governmental rules.

9.8 In-seasonal Movements

The Aru nomads move quite frequently between different locations within different seasonal grazing areas, and sometimes even crossing into another seasonal grazing area is necessary. For example, heavy snow during summers, and since sheep and goats are poor diggers, the nomads have to wait to bring the sheep and goats out to graze until after the snow has melted. As we witnessed during September/October 2000, it can snow for days on end, making it impossible to bring the animals to the summer pasture (Campsite 1, Map 9.2 September 2000). The consequence was that the nomads had to take their animals down to the winter grazing area east of their camp (# 4, Map 9.1), since this area was relatively free from snow, as it was further away from the mountains. Tsering told us that moving because of bad weather is something that happens relatively often. Also, as previously referred to, 8 households from 2 different campsites from Longdo Tsho chung changed their location in June 2000, the reason being heavy snowing. Originally they had camped closer to the mountains (Map 9.2, Campsite 5 & 6), and they were therefore subjected to a period of much snow. Fearing for the lives of their livestock they therefore changed camps, moving away from the mountains and thereby avoiding the full force of the snow (Map 9.2, Campsite 7 & 8).

9.9 Settlement Patterns

Settlement patterns are largely determined on the basis of *size of pasture* and *quality* of pasture. For example Campsite 1 in June 2001 (Map 9.4) consisted of six households since it was considered “a good place”. This place was both close to water, had good shelter from the wind and also had easy access to a large grazing area, northwest towards the mountains, making it possible for several households to live side by side. However, it is not only the size of the pasture that is important, but also the *quality*. According to the

nomads, Campsite 1 in June 2001 (Map 9.4) had all of the right qualities, making it possible for several households to live close together. This was also the case with Campsite 2 in September 2000 (Map 9.3), where twelve households from Kontrok Tsho chung lived side by side. As Tsering explained: "This site has very good grass, and can therefore sustain a large number of animals".

Another factor deciding the number of households that can live together is obviously the number of animals: when a household has a large flock, they choose to live away from other households. For example, one household from Kontrok Tsho chung, Migmar, usually has his tent put up far away from the other nomads, and herds his animals alone (Map 9.3, Campsite 2). The main reason is that this household has the largest herd, and consequently needs more grassland for his herd. The Aru nomads display some flexibility in their settlement patterns, making them able to adapt to varying situations of grass quality and amount. As a rule of thumb we can say that the largest number of households living together is determined by the amount and quality of grass, while the smallest number of households living together is decided by the availability of labour. There is no use in taking an advantage of a grazing area that can only support one household, if this household does not have enough labour available to manage the daily workload.

On the other hand settlement patterns are also influenced by social concerns. As previously mentioned 2 households from Kontrok Tsho chung were living with relatives on the Gertse side of the basin in September 2000, and one household from Gertse xian stayed with their relatives on the Rutok side of the basin at the same time.

9.10 Summary

What emerges is a system of mobility and settlement that is both unpredictable and frequent on an in-seasonal level, while relatively predictable on a seasonal level. Although, settlement and movement patterns for both Rutok and Gertse xian are described here, my main focus was on the processes underlying patterns for the nomads in Kontrok Tsho chung, Rutok xian, since I have far more information concerning their settlement and movement patterns. However, the general processes underlying the different patterns of settlement and moving are probably relatively similar to both areas, and also for the two other groups of nomads using the Rutok side of the basin mentioned here, if not for all nomadic pastoralists living in similar environments.

Seasonal movements are decided on the basis of climatic and ecological factors, e.g. areas with much snow during winter are unsuitable as grazing areas during winter. *In-seasonal movements*, are usually based on a day to day monitoring of climatic events, nomads staying close to mountainsides during summer usually move when heavy snowing occurs.

The main factors regulating the number of tents staying together at the same place are the *quality* and the *amount of grass*. If the grass is good then the nomads prefer to live close together, depending on the size individual herds. However, herding groups also have consequences for the settlement patterns since households that share herding responsibilities have to live close together.

Chapter Ten: Macro-Political and Macro-Economic Processes

10.1 Introduction

Although the pastoral production system in the Aru basin has been described as an independent and closed system, this has neither been so traditionally nor is the case today. An open system can best be described as being part of a larger system, i.e. there is always interaction between a system and other factors designated as outside of the system. The Aru nomads are for example influenced by both economic and political decisions made outside of the basin and which can be defined as being taken on a macro-level. These decisions can imply risks for the system, since they are not necessarily made with reference to the specific needs of the Aru nomads' production system.

Tree examples of macro-political and macro-economic decisions and their consequences for the Aru nomads' pastoral production system will be illustrated here, namely,

1) Cashmere prices. The Aru nomads are relying on a cash income from sale of wool and especially cashmere wool. The prices fluctuate on a yearly basis, making the nomads level of income increase or decrease dramatically every year. Cashmere prices are dependent on both international and national markets outside of the Aru nomads' control, making their economy dependent on both their own production and these macro-economic structures.
2) The ban on hunting. As seen, the Aru nomads have had a tradition for hunting wildlife as a means of subsistence diversification. However, in the mid 1990's a ban was declared on the hunting of herbivores such as chiru, gazelles, wild yaks and kiangs along with wolves, bears and snow leopards due to a decrease in populations.
3) Change in movement patterns as a result of a decrease in grazing area due to a change in land tenure policies.

10.2 Cashmere Wool Production: The Integration into a Market Economy

The implementation of the new economic reform policy in Tibet Autonomous Region (TAR) by the end of the Cultural Revolution brought the nomads in TAR closer to a market economy. Traditionally, trading has played an important part in the nomads' way of life since they relied on other products than livestock products to make a living. Until very recently trading was the usual way to obtain goods they don't produce, Goldstein & Beall (1990:100) report that the Phala nomads traded one sheep for 20-35 kg of barley as late as 1987 and that they got around two and a half kg of barley for 0.5 kg sheep wool.

Today, nomads sell their livestock products, primarily wool, on governmental markets, receiving money, which they use to buy needed products, making them more dependent on cash than before. The Aru nomads reported that they could (in 2001) get around 200 Yuan for one live sheep, 100 Yuan for one goat and around 800 Yuan for one yak. Meat from one sheep would give them 100 Yuan, 50 Yuan for the meat from a goat and 800-850 Yuan for the meat from a yak. However, the Aru nomads usually do not sell meat. The only places where they can sell meat is at town centres, and the nearest one is a two-three days journey away by car, making it too expensive with regards to time, fuel and maintenance of the car etc, to undertake such a journey. What they do sell is wool, and then especially cashmere wool, which has increased in importance along with the increasing prices for cashmere wool.

Picture 10.4 Harvesting Cashmere wool

During the last 15-20 years cashmere wool has become more and more popular among the general public in the west. Before that, cashmere products were considered to be a luxury item, and only the elite could afford it. With the increasing popularity of cashmere products, the government of PRC, including the TAR, has become increasingly concerned with trying to control cashmere wool production within its borders. Cashmere wool is the soft down undercoat of goats, and the nomads, come June, comb the cashmere, out with long teethed combs (Picture 10.4). Then they continue by cutting the long hairs, or *tsiba*, with knives so that they can get to the rest of the cashmere wool, which is sheared in June because this is when the cashmere wool has the best quality. Some nomads also try to "weed" out most of the

long, coarse hairs that tend to be mixed in with the soft cashmere wool, arguing that this will give them a better price on the market.

The Aru nomads have to fill quotas of both sheep wool and goat cashmere the amount of which is determined by the local government on the basis of each household's size of herd, and the amount of wool one animal should give. However, the governmental quotas are usually higher per animal than average yields (Table 10.1).

Table 10.1: Showing the difference between governmental set quotas and actual yield for sheep and goats in the Aru basin. Numbers are given as averages.

	Quotas	Actual Yield
Sheep		
Male	1 kg	0.75 kg
Female	1 kg	0.5 kg
Goats		
Male	0.25 kg	0.15 kg
Female	0.25 kg	0.10 kg

Failure to provide the quota is punished by a fine of 15 Yuan for each animal, both sheep and goats. Fines are usually determined after estimating the households' economic capacity, i.e. its capacity to actually pay the fine. Failure to meet sheep wool requirements is usually not punished since sheep wool is not as important as cashmere wool.

The Aru nomads are entitled to keep around 10-15 kg of sheep wool or goat cashmere wool for their own use, or sell to private traders. Because of the high price for cashmere wool, and also because sheep wool is of more use to themselves, they tend to sell all of their cashmere wool on governmental markets and keep all of the sheep wool, since it can, in the nomads' words "[…] *be used for everything, like clothes, bags, blankets, shoes and many more things*".

The sale of cashmere wool from goats now makes up a substantial part of the nomads' cash income. However, cashmere prices tend to fluctuate, depending on international and national markets' demand, causing the nomads' economy to fluctuate on a year-to-year basis. The price for cashmere wool has seen an overall increase during the last ten years, although seasonal and annual fluctuations on the international market can be dramatic. On the southern plateau, in 1988 the county trade office in the Phala area, Shigatse Prefecture,

paid nomads 13 Yuan for 1 jin[29] of cashmere wool (Goldstein & Beall, 1991), whereas in 2000 nomads from the Aru basin were paid 150 Yuan per jin. Over the same period, sheep wool prices have not increased, with the Phala nomads receiving 3 Yuan/jin in 1987 (Goldstein & Beall, 1990), and the Aru nomads receiving 2.1 Yuan/jin in 2000.

Although the price the nomads get for cashmere wool has on average increased, prices are affected by the international market. Accordingly, during the years 1990-1999 prices ranged from 65 Yuan/jin in 1999 to 170 Yuan/jin in 1998 (Table 10.2). Also, the nomads have to sell most of their cashmere production to the government, even though they would get better prices from private traders. For example in 1999 the government paid 65 Yuan/jin, while the price from the private traders was almost 20 Yuan higher. This had also been the case between 1993-1999, while in 2000 the government price and the price from private traders was equal.

Table 10.2. Prices reported[30] by Aru nomads for cashmere wool from government buyers from 1993 to 2000.

Year	Price in Yuan per jin
1993	75
1994	75
1995	65
1996	110
1997	75
1998	170
1999	65
2000	150

Cashmere prices also reflect quality of the product, with white, for example, giving a better price than coloured cashmere. Also, male adult goats tend to yield more, and better quality cashmere wool than female goats. According to the nomads this is due to the fact that pregnant goats canalise energy to the foetus, which reduces the growth and quality of the wool. Also, pregnant goats tend to demand more care from the nomads, and increased physical contact between nomads and animals leads to shedding of some wool. Consequently, wool from female goats gives a much lower price on the governmental market, than wool from male goats. The quality is also dependent on the amount of fodder

[29] 1 jin is around 0.5 kg, and 1 male goat of average size yields approximately 0.3 jin cashmere. A female yields a little less. 10 Yuan = ca. $1.26 (2002).

[30] It must be kept in mind that these prices were given from the memory of some of the nomads, and they were not sure if they remembered them right, i.e. if they gave the right price for the right year. However, the general argument that prices fluctuate still holds true.

that the animals get. During years with heavy snowfall and scarce access to fodder, the cashmere will be of poorer quality, again giving a lower price. These factors influence the nomads' level of cash income, and they strongly feel that they never make enough money to cover their basic needs. As a consequence, the sale of cashmere wool is an uncertain and risky enterprise.

Nevertheless, cashmere production makes up a substantial part of the Aru nomads cash income. For example, in September/October 2000 an average household (4.5 people, 165 sheep, 82 goats and 12 yaks) in the Aru basin had made around 4,000 Yuan from the sale of cashmere wool and sheep wool in June. While goats, on average in September/October 2000, only comprised around 30 percent of the total herd, the income from cashmere wool comprised around 70 percent. Nevertheless, a family's income will dramatically oscillate depending on the fluctuation in cashmere prices, while an individual family's expenses with regards to taxes, food, clothes is rather permanent from one year to the next.

Annual Expenses. Annually the Aru nomads have to pay taxes as shown in Table 10.3.

Table 10.3. Annual taxes reported by the Aru nomads.

Horse	10 Yuan per horse
Yak	10 Yuan per yak
Sheep/goat	0,6 Yuan per animal
Tax to the army	1 Yuan per person
Tax to the poor	2 Yuan per person
School tax	3 Yuan

Also, nomads with a truck have to pay 4,500-4,600 Yuan per half year in "car tax", and truck owners have to buy around 15 barrels of gasoline annually, costing around 700-900 Yuan a barrel. Nomads without a truck, or co-ownership in a truck, have to pay 4 Yuan per km if they need the use of a truck to move. Also, when the nomads go to Gertse or Rutok to sell their wool, nomads that do not own a truck have to pay 0,2 Yuan per jin of wool to the truck owners as a fee.

However, the annual tax will of course vary for individual families, and therefore I will use one rich family, namely that of Migmar, and one poor family, that of Chamba, as examples of tax expenses for 2001. During 2001 Migmar's household consisted of 9 members, 50 yaks and 421 sheep and goats. Chamba's household consisted of only 3 members, 2 yaks

and 49 sheep and goats. Migmar then had to pay around 780 Yuan in taxes, while Chamba paid around 65 Yuan in 2001.

To simplify, I calculated that both Migmar and Chamba sold all of their cashmere wool and sheep wool, and that both male and female sheep, and goats, yield the same amount of wool and also gave the same price. Migmar then sold 52 jin cashmere wool, and 374 jin sheep wool. Chamba only sold 5 jin cashmere wool and 50 jin sheep wool. To transport the wool to the marked Migmar had to pay 85 Yuan, while Chamba paid 15 Yuan. For this year Migmar's annual expenses was around 865 Yuan, while Chamba's was around 80 Yuan.

Income. According to the Aru nomads, the government would pay the same price for cashmere wool in 2001 as in 2000, namely 150 Yuan per jin. Sheep wool gave 2,1 Yuan per jin. Accordingly Migmar made around 8,600 Yuan in 2001, while Chamba only made 860 Yuan. Both Migmar's and Chamba's expenses made up 10 percent of total income, leaving Migmar with 7,740 Yuan and Chamba with 780 Yuan. However, in a year when the cashmere price was at is lowest, as in 1995 (Table 10.2), Migmar would only have made 4,200 Yuan and Chamba 430 Yuan, reducing both of their income by half. After annual expenses have been paid, especially Chamba would have been in a bad position, since the Aru nomads rely on buying supplementary food, and also clothes. To add to the expenses, almost all of them have a winter house and are in the possession of a solar cell panel. A winter house costs between 5,000-10,000 Yuan depending on size and number of rooms, and a solar cell panel costs around 1,500 Yuan. As such, fluctuations in cashmere prices greatly influence any given family's capability of buying necessities.

Nevertheless, neither of these families would be capable of providing enough food products for their families according to Table 10.4, regardless of the price of cashmere wool.

Table 10.4. Estimates over food necessary for one person per year and its cost given by the Aru nomads.

	One Person's need	Price (totals)
Rice	200 jin	360 Yuan
Barley	180 jin	300 Yuan
Flour	200 jin	400 Yuan
Tea	2 packs	150 Yuan
Cooking oil	150 jin	360 Yuan
Salt	150 jin	50 Yuan
Sugar	200 jin	700 Yuan
Butter	150 jin	2250 Yuan
Total		**4570 Yuan**

Now, one could probably argue that the estimates given in Table 10.4 are high, and will probably never be attained. On the other hand, this may be said to be irrelevant, since the main point is that Aru nomads themselves perceive their level of income to be far below what they feel is necessary. However, a way of increasing their cash income has until recently been by hunting.

10.3 A Change in the Production System: Towards a New Economic Base?

In Tibet, cashmere wool has traditionally not been of major importance to the nomad economy (Ekvall, 1968; Goldstein & Beall, 1990; Goldstein *et al*., 1990), although they did barter and could also pay taxes with cashmere wool. The nomads kept more sheep than goats in the traditional society, and probably also valued sheep more than goats (Ekvall, 1968). With an increasing demand from the government to produce excess cashmere wool for cash, they have begun to value goats more than sheep. Although goats produce more milk than sheep, nomads tend to value milk from sheep more than from goats, illustrated by the fact that they tend to blend milk from goats with sheep milk. Also, goat milk is used primarily because they do not have enough sheep to cover their need for milk products. The nomads also prefer to eat meat from sheep. Sheep wool is of more use to the nomads than cashmere wool, because it is used to make bags, clothes and carpets, while they use only the long coarse hairs from the goat to make ropes.

According to Goldstein & Beall (1990) with the increasing importance of cashmere wool, goats could be the new economic basis for nomadic pastoralists in Tibet. In 1981 the ratio between sheep and goats in Phala were 3:2, while in 1988 the ratio was 1:1. Even though the cashmere prices have increased dramatically since the Phala study, and the nomads' preference for sheep meat leading to a higher killing rate of sheep as opposed to goats (Goldstein & Beall, 1990), my data from Aru indicates a relatively low proportion (30

percent) of goats. One of the reasons for this, according to some of the nomads, is that the mortality rate for newborn goats is much higher than for sheep. As one nomad said: "*If three goats give birth, only 1 of them will survive, but if 1 sheep gives birth, the lamb will survive*". Some claimed that this was so because the grass in the basin is much better for sheep than for goats, resulting in goats not producing enough milk for their kids after giving birth, but it is difficult to asses such information.

The increased importance of cashmere wool has probably not only affected the species composition in Tibet, although not yet in Aru, but also the sex composition. Male adult goats tend to yield more cashmere wool than female goats, and there are now more male goats in a goat population than it would have been during the traditional system, since the focus of production has changed from being primarily a milk and meat production system to become a system where focus is also placed on producing excess cashmere wool.

Consequently, there are now more male goats in a herd of goats in Aru than necessary for just reproductive purposes. For example, in one herd of goats in the Aru basin, totalling 100 animals, around 50 percent of the animals on average would be male. However, 50 male goats are more than needed to keep up the reproductive ability of the herd. In a herd of this size, only 2-3 male goats are kept fertile, the rest are castrated. The raison d'etre for keeping herds with an almost 1:1 ratio of male/female goats is therefore probably connected with the increased importance of cashmere wool.

The same sex ratio seems also to apply for sheep in the Aru basin. On average the sex ratio between female and male sheep is 1:1. Miller (2000) states that in the Phala region, almost 60 percent of adult sheep and goats are females. He indicates that the male proportion then is relatively high, but explains it by the fact that a relatively large proportion of the nomads' income derives from sheep wool and cashmere wool. Also, nomads raise adult male sheep to slaughter for their own needs.

The percentage of adult male sheep is around 50 percent in the Aru basin. As in Phala, there is a preference for sheep meat, and male sheep yield more meat because of their size. Size differences also have consequences for wool production; male sheep yield on average 0.75 kg of wool, while female sheep only yield 0.5. On the other hand, sheep wool is not so valuable as a cash crop as cashmere wool, making it doubtful to argue that the high ratio

of male sheep is connected to the sale of wool. As previously stated, sheep wool is of more use to the nomads themselves, and maybe the high ratio of male sheep can be explained by the demand for sheep wool for their own use. One reason could also be that sheep give birth January, when winter is at its hardest. This can exert a large amount of stress on female animals: grass is scarce and since a lot of energy goes to the caring of the newborn, which could result in a higher mortality rate for female sheep than for male sheep during the precarious winter months. On the other hand, I do not have any evidence to support this claim, and further research is needed.

The Aru nomads do make an effort to influence the composition of their herds, both with regard to species-, age- and sex-composition. They have to make husbandry decisions in order to balance subsistence needs of a household and surplus need for wool for sale on governmental markets. For sexual composition they have to find a balance between raising male goats, from which they can sell cashmere wool, and the need to raise female goats that are both necessary for the continued reproduction of the herd and which would give a much needed milk, i.e. they have to consider both the growth of capital as herd and the growth in cash profit as the yield of cashmere wool from individual animals. Because of the alleged high mortality rate for newborn goats they have to keep a higher number of females to keep up the reproductive ability of the herd of goats, than if the mortality rate was lower. For the nomadic populations in Aru an adequate number of reproducing females to provide offspring are necessary, both to replace older and slaughtered animals in the herd, but also to provide males that give more and higher quality wool.

From a purely subsistence point of view it would seem reasonable to the Aru nomads to keep a larger number of sheep than goats, since sheep products, like meat, milk, wool and skins, are preferred over goat products. Nevertheless, it is still surprising that the ratio between sheep and goats are 7:3, since cash income has become more important, and a larger percentage of sheep are slaughtered because of their meat preference. Also the alleged high mortality rate for goats contradicts Goldstein & Beall's (1990:104) findings, where they state that goats are hardier than sheep, and are considered to provide some insurance against losing an entire herd in a very bad year.

10.4 The Ban on Hunting

From the late 1980's and the beginning of the 1990's the motivation for hunting chiru changed from primarily a supplementary source of meat to become a cash activity. Also, during this time the popularity of the shatoosh wool increased both in India and Europe. For example in 1995 the New York store Bergdorf Goodman advertised shatoosh in this manner:

> "The source of the wool is the mountain Ibex goat of Tibet. After the arduous Himalayan winter is over, the Ibex sheds its down undercoat by scratching itself against low trees and bushes… A difficult process then commences as local shepherds, called Boudhs, from the region of Changtang, Tibet, then climb into the mountains during the three spring months to search for and collect this matted hair. " (From Schaller 1998:300)

Most of the facts in this quote are wrong, but the facts that a product was obtained sustainable by poor, hardworking, indigenous people made, shatoosh an ecologically and politically correct luxury item. The international trade of shatoosh has been illegal since 1979 when it was put on the list of the Convention on International Trade in Endangered Species (World Conservation Monitoring Centre, 1998). To collect the shatoosh from the chiru, the nomads in the Chang Tang area first had to kill the animals.

The prices for the shatoosh increased dramatically in the early 1990's. Prior to 1990 one skin could be sold for 60-70 Yuan, but in the early 1990 one skin would sell for around 400. This was a result partly of the increased foreign demand for "shatoosh", and also because the antelope in 1993 was proclaimed as an endangered species under Chinese national law. This made the hunting more dangerous. Therefore, the motivation for hunting the chiru changed from mainly being a means of diversifying subsistence risks, to a more "capitalistic" motivation: hunting the antelope could give the nomads a means of making money far superseding anything they could dream of making through selling products from their livestock alone. In the early 1990's some of the nomads also bought modern rifles. With the traditional flintlock rifle and leg-hold traps, an individual hunter could typically kill around 20-30 animals per year, with the modern rifles the take could easily increase to over a 100. As a consequence, an average household in the Aru basin, with a modern rifle, could easily make 40,000 Yuan annually by selling skins from the chiru, i.e. around ten

times as much as a household would make by selling livestock products. Hunting was therefore a strategy that could dramatically increase cash income.

But, soon after the chiru offered the nomads a potential for cash income that far superseded their income from sale of livestock products, a ban was declared by the state on all hunting in the nature preserve (1993), since the number of wildlife had decreased dramatically. The Aru nomads, who until then in situations of scarcity had relied on hunting, now experienced a drastic decrease in living standard, and several emphatically stated that their livestock did not produce enough milk, wool or meat to sustain them throughout the year. Before the prohibition they could compensate for this by hunting. Hunting also had direct consequences for capital growth, as measured in number of animals. With no hunting, the nomads have to consume a larger part of the yield of their capital than they would otherwise have done. This can have dire consequences, since they are constantly under the threat of losing parts of their herds due to environmental factors. This could negatively affect the number of animals needed to survive a disaster, i.e. the minimum number of animals needed to recover when struck by e.g. blizzards (Goldstein *et al*., 1990). Today, because of the above circumstances, the hunting ban is not rigorously enforced for small-scale hunting (although the ban on sale of chiru skins is enforced).

Also, the ban has resulted in some resentment toward wildlife, and then especially toward the chiru. While hunting gave the Aru nomads a feeling of getting something substantially back from the presence of wildlife, the ban has resulted in the view that wildlife competes with their livestock for forage. Several nomads stated that they did not believe that life for both humans and chiru is possible in the basin. As Tchinle said:

> "W*henever we move to summer grazing, the tso [chiru] moves to our winter pasture and eats up all of the grass. When we then come back in winter, there is almost no grass left for our animals*."

As a consequence, some nomads want support from the regional government to fence in their winter pasture and thereby secure exclusive user right for their livestock.

10.5 Change in Movement Patterns

Today the system of grazing in the Aru basin is different from what it was traditionally. Goldstein *et al*. (1990:151-152) Write:

> "The nomads' feudal lord, the Panchen Lama, owned all pastureland and allocated plots of pasture to individual households which then had exclusive usufruct rights over them for a given period of time. Each pasture was considered suitable for a fixed number of animals calculated on the basis of a unit locally called *marke*. One marke of pasture in Lagyab lhojang [This is the name for one of the Panchen Lamas pastoral estate, encompassing the Phala area] was calculated as equal to 13 yaks, 78 sheep, or 91 goats (based on a conversion rate of one yak to six sheep or seven goats) in the 1940s and 1950s. Thus, access to a pasture with a one-mark rating would be allotted to a household with some combination of animals totalling 13 yaks, 78 sheep, or 91 goats. A pasture of two mark would be allotted to a household with twice that number. Each pasture was expected to sustain only what was considered an appropriate number of livestock."

Every third year there was a census in which each household's herd size was determined, which then formed the basis for how much pasture the household got allocated and how much tax they had to pay. Additional pastures were allocated to households whose herds had increased, and pastures were taken away from those whose herds had decreased. Each household's pastures, and annual taxes, remained fixed during the three-year interval (Goldstein *et al*., 1990). As for Aru, it does not seem that such a rigid system of pasture allocation and reallocation, as in Phala, was in place, mainly because the density of people and animals was lower than in more central parts of Tibet. However, pastures in Tibet were never used indiscriminately, but instead was widely regulated with regards to size of herds and pasture.

The patterns of moving and grazing in the Aru basin have changed from the traditional era and up till now. Traditionally, the Aru basin was only used seasonally, with winter as the primary season. According to one nomad, the Aru basin was never used because of good grazing, but because of its great hunting opportunities. As a consequence, nomads would only use parts of the basin for a relatively short period time. Today the pattern has changed: Now two groups of nomads use the basin all year round, i.e. they never move out of the basin. As a consequence, mobility has decreased and the use of the basin has

increased. This change can be discussed in relation to a change in land tenure system from traditional times and today.

According to Ho (2000) the land tenure system in The People's Republic of China (PRC) is of a nature where individuals or groups "lease" land from the government. In such a way the land tenure system tries to minimise the impact of the 'tragedy of the commons'. Hardin's (1968) 'tragedy of the commons', states that individuals having free access to pastures will maximise their own interest by adding more and more animals to their own herds, even if the land is facing overgrazing and degradation. The way out of this vicious circle is to have the land owned by the same persons that owned the animals, i.e. private access. This would give the individuals an interest in maintaining the potential of the land. This model has been widely rejected by many researchers (e.g. Sandford, 1983; McCabe, 1990), but it appears to be the primary justification for the pastoral reforms in PRC (Humphrey & Sneath, 1999). However, as Goldstein & Beall (1990) discuss, the pasture in Tibet has never been completely opened for common usage, instead its use has been regulated by institutions such as monasteries.

In 1987, the government decreed that there should be a limit on how many animals one individual could keep, in order to avoid pasture degradation. The underlying rationale behind this decision, was not based on direct monitoring of the environment but

> "[…] rather on inference and assumptions derived from livestock census data-for example, on data such as that produced by a major Chinese study on pastoralism in Tibet which reported that there was a 113% increase in the number of livestock in Tibet in the 23-year period from 1958-1981 despite the disruption of the 1959 uprising and the Cultural Revolution." (Goldstein & Beall 1990:174)

As a consequence PRC in general is viewed as being faced with both an increase in livestock numbers and a decrease in rangeland areas, creating an intensification of use.

Also, according to Goldstein & Beall (1990), the government's attitude seems to follow the idea that traditional pasture management is inefficient and destructive, and do hinder an effective development of the pastoral production system and rangeland management. However, this way of reasoning is probably too simple since nomadic pastoralists have

managed to make a living on the Tibetan Plateau for thousands of years. It also begs the question whether what constitutes as efficient development of pastoral areas for the government, is the same for the pastoralist populations of TAR.

Also, Goldstein & Beall (1990) argue that the point of increased animal numbers is questionable, at least for the Phala area. Instead they show that there has been an overall 8 percent decrease in livestock numbers from 1981 to 1988, a 4 percent decrease between commune dissolution in 1981 and 1987, and another 4 percent decrease after the 20 percent reduction decree between 1987 and 1988 (Goldstein & Beall, 1990). As to why the government argue that there has been an increase in livestock numbers, Goldstein & Beall (1990:178) write:

> "We discovered that at the time of commune dissolution only the animals owned by the commune were divided equally. And additional number of animals comprising the "private holdings" (*gersha*) of the nomads remained the property of each household *and do not appear in the 1981 records*. In Pala, these "private animals" totalled about 1,800 goats-that is to say, the official total was roughly 20% lower than the actual number."

The consequence was that the records show that there has been an 25 percent increase from 1981 to 1987, or a 2.4 percent annual growth rate rather than the actual four percent decline (Goldstein & Beall, 1990). At present there is no evidence suggesting that the same has been the case elsewhere in Tibet, or more specifically in the Aru basin. However, at the same time as a reduction in livestock numbers were decreed in Phala, the local leaders in charge of the Aru basin and surrounding areas were also ordered to decree a reduction. Luckily, this decree was never implemented, basically because local leaders in charge of this area recognized that nomads in this area had few animals. Nevertheless, a limit was set on how many animals an individual nomad can have, a total of 110 animals per individual are the maximum limit. Today there are no household within the Aru basin that are close to this.

The limitations set on stocking levels in Tibet and elsewhere, suggest that the pastoralists themselves are incapable of looking beyond their own needs, and therefore are characterised as "backwards" and "unscientific". It is also assumed that pasture lands have

an easy measurable carrying capacity, that it is only capable of supporting a maximum number of animals, and exceeding this level will lead to overgrazing. However, this idea seems to rest upon an assumption that population size is regulated by its food supply by a density-dependent feedback relationship (Behnke & Scoones, 1993). In other words, this approach suggests that there exists a natural equilibrium between animals and vegetation. New research, has questioned this assumption, and instead suggests that in areas with low and variable rainfall, the concept of carrying capacity is of little use (Behnke & Scoones, 1993). This new approach suggests that in some rangeland systems, the grazing system (vegetation + animals) cannot be said to fluctuate around an equilibrium norm. Instead, since there is a high variation in rainfall from year to year, vegetation will also vary, and thereby create a disequilibrium grazing system that is event driven rather than driven by the relationship between animal populations and grass (Behnke & Scoones, 1993; Ellis *et al*, 1993). How this functions in the grasslands of Tibet is unknown, although Goldstein (1996) reports that, "the recurrent episodes of livestock decimation appear to have been frequent enough to create a stable, non-equilibrium system in which grasslands were not systematically destroyed despite continuous utilisation for at least one, perhaps two or more, millennia". This probably makes the pastoral system work in non-equilibrium fashion (Miller 2000; Goldstein *et al*., 1990). Even in areas with sufficient rainfall and where pastoral system seems to operate in a stable manner with regard to forage production, severe climatic events that are characteristic of non-stable systems, such as blizzards, play an important role in the ecosystem (Miller, 2000). However, Schaller (1998) suggests that the rangelands of the Tibetan Plateau resemble an equilibrium ecosystem where a relatively predictable annual monsoon driven vegetation production occurs. On the other hand it is the unpredictable snow events (as previously described) that causes livestock losses. On the other hand, Fox *et al* (in review) state:

> "But, if snow-determined forage availability is the major environmental factor, then unlike the unpredictable drought-affected pastoral systems where fundamental forage production is greatly affected, in Tibet the forage is there (and often enhanced by the moisture brought in form of snow) and in-situ recovery potential for livestock is high once the snow disappear."

However, this is something that needs further investigation. At present there is no information available to assess the state of the rangeland in the Aru basin, although the Aru

nomads claim that the quality and amount of grass has been reduced since they came back to the Aru basin in the early 1990's, and being mainly caused by the presence of wild herbivores.

Nevertheless, according to the disequilibriium model, pastoralists should have flexible access to large areas of land, and the spatial mobility of pastoralists are likely to be more efficient than the allocation of limited areas of pasture to individual households. This is not the case in Aru, whereas in the traditional era, the Aru basin was only used seasonally, today nomads use the basin permanently. What the long term consequences of this change in grazing patterns will be are unknown, but Humphrey & Sneath (1999:292) argues that for Mongolia"…pasture degradation is associated with the loss of mobility in pastoral systems." On the other hand, a return to more traditional system of mobility in the Aru basin and the surrounding areas is somewhat hard to imagine since areas outside of the basin is already in use by other nomadic pastoralists.

10.6 Summary

It can be argued that the way the nomads organize the keeping of both goats and sheep is a reflection of *risk diversification* strategies on different levels of production, *species diversification* strategies, i.e. losses are diversified, and *subsistence diversification* strategies, i.e. different eggs in different baskets. Today goats are mainly kept for surplus purposes, while sheep for subsistence purposes. The raison d'etre for keeping many male sheep can be explained as a subsistence strategy (wool and meat), while the keeping of many male goats can be explained as a surplus strategy (cashmere wool). Nevertheless, a balance has to be found: females are both needed to produce males – both for subsistence and surplus production, and milk (subsistence).

Some researchers have criticized the integration of nomadic pastoralists into a market economy, since it has been viewed as putting undue stress on their economic pattern, *because the traditional technologies of a subsistence-based economy cannot keep up with the demands of a surplus market* (Khazanov, 1994). However, instead of viewing the market demand for cashmere wool as problematic, i.e. something the nomads can not control and something that stresses their production system unduly, I prefer to view the market as a way of organizing their own production system to accommodate the market *to diversify risk*. From this perspective, the increasing importance of cashmere wool can be

viewed as giving them new opportunities instead of decreasing their choices. As Tsering said: "*Today I am not totally dependent on meat, if I make enough money from selling wool, I can buy food*." This can be viewed as a safety measure for nomads, during years when they get high prices for their cashmere wool, households do not have to slaughter too many animals, since they can buy some extra food. Nonetheless, cashmere wool production is an unpredictable and variable enterprise, since price changes greatly influence the nomads' level of income. Also, unlike hunting, the income from sale of cashmere wool is dependent on the numbers of animals a households has, and as shown this can fluctuate.

Traditionally, hunting worked as a means of subsistence diversification, and the extent of hunting was decided on the basis of the general economic situation of any household. So hunting was a means of diversifying subsistence risk in two ways: on the one hand they could hunt so that they could reduce the capital off take of their herds, and thereby decrease the probability of falling below a minimum subsistence level if a disaster struck. On the other hands, hunting was also a means of reducing the effect of disasters, if livestock was lost due to e.g. a blizzard, they could compensate for this by hunting, and again avoid cutting into the capital. However, in modern times the motivation for hunting changed from being primarily subsistence motivated practice to become cash motivated practise, and with the ban the nomads cash income has dramatically decreased.

As described, a typical disequilibrium system, like in some places in Africa, is the result of unpredictable droughts reducing the amount of vegetation. In the Aru basin, and probably in other parts of Tibet, it is not the amount of vegetation on the rangeland that is critical, but its *availability*. Unlike, droughts, snow only cover up the vegetation, when the snow has disappeared the grass is again accessible in a more affluent state for animals. As been discussed, it is not known whether the rangeland system in the Aru basin, and more generally in Tibet, can best be described as a system in equilibrium or disequilibrium. On the other hand, according to the disequilibrium model, pastoralists should have flexible access to large areas of land, and that by being mobile, pastoralists are likely to be more efficient than if they are allocated a limited area of. Whereas in traditional times, the Aru basin was only used seasonally, today nomads use the basin permanently and intensification in use is likely. What the long terms consequences of this change in grazing

patterns will be are unknown, although decrease in mobility have been associated with pasture degradation in e.g. Mongolia (Humphrey & Sneath, 1999).

Chapter Eleven: Summary

11.1 The Pastoral System

To sum up, the focus of this thesis has been the *production system* of the Aru nomads. As such, the production system has been conceptualised as a *subsystem* within a larger *ecosystem*, i.e. the Aru basin and all of its composites, whether ecological or social. However, the production system can also be viewed as a subsystem within the overall *pastoral system*. As such, this thesis can be viewed as a tentative description, i.e. model, of the pastoral system in the Aru basin. Yet, as previously indicated *models* are abstractions and analytical by nature, which aim is to illuminate certain aspects, or processes in the empirical world. According to Flannery (1972) a subsystem displays two opposing features, namely that of segregation and centralisation. Following Fratkin *et al*. (1994) subsystems have been viewed as individually identifiable, i.e. segregated, but also interdependent, i.e. centralized. A focus has been placed on (1) the production system and how this has been influenced by the ecological surroundings, consequently leading to subsistence diversification. Two other subsystems and their relation to the production system has been discussed, namely (2) the organisation of labour and finally (3) the case of mobility. The issue has been to show the interaction, i.e. interdependence, between these subsystems. Although the total ecosystem in the Aru basin can be conceptualised as closed, i.e. independent of outside forces, it makes much more sense to view it as an open system since, as shown, the production system is influenced by (4) macro-political and macro-economic decisions taken outside of the Aru basin. Nevertheless, systems theory has only been used as a meta-theory in this thesis, meaning that it can only model certain phenomena and their relations in the world, while the *explanation* of the phenomena has to come with recourse to another theory, which in this case has been that of *risk*.

11.2 Risk: Variability & Unpredictability

Risk has been defined as an "[…] unpredictable variation in some ecological or economic variable […]" and "the probability of loss or hazard." (Cashdan, 1990:2-3). As indicated before, the distinction between these two definitions is somewhat unclear,

since unpredictable variations in ecological conditions (e.g. blizzards) can lead to increased probabilities of falling below a minimum subsistence level.

A central theme has been that of *variability* and *unpredictability*. According to Halstead & O'Shea (1989) *variability* may be conceptualized in two different ways, (1) as a variation in food supply or (2) by describing the factors that influence the availability of a particular food, in this case *animals*. As for the Aru basin, the question can be conceptualized as what ecological factors influence the number of animals at any given time. Even though organisms must cope with a multiplicity of environmental problems, their survival is usually limited in any given context by just one or two critical resources. In the Aru basin, the nomads are dependent on their animals to survive, and as such *animals* can be said to be both a limiting factor and a critical resource

11.3 Ecological Hazards

I have tried to show that there are mainly four ecological factors that increase production risk, i.e. increase the probability of loss and hazard to animals in the Aru basin, namely (1) snow related problems, such as blizzards, (2) predation, (3) poisonous grass and (4) possible grassland degradation. As shown, (1) snow related problems are the most important factors that, according to the Aru nomads, cause the loss of livestock annually. On the other hand, snow can have a cumulative effect since livestock usually don't forage on poisonous grass when grass is abundant. Also, long term snowing can have the effect that predators have difficulties in finding food among its natural prey, e.g. wildlife, and will subsequently attack livestock. As for grassland degradation, the result is that animals get less grass and consequently are less able to cope with climatic hazards, e.g. blizzards. Although the Aru nomads claim that the grassland in the basin has decreased in quality, there is at the moment no objective evidence available to assess this. Contrary to the Aru nomads feeling, the relative abundance of wildlife within the basin suggest that the state of the grassland is relatively good, since according to Goldstein & Beall (1990) wildlife would not be present if severe grassland degradation had occurred.

Especially blizzards can be viewed as a problem since, as a climatic phenomenon, they vary according to a *temporal* and *spatial* scale: while some households experience deaths of many animals other experience almost none. The highest reported number in 2001 was

200 animals, while the lowest was around 6-7 animals. Also, nomads from Gertse xian reported almost no losses; the highest reported being 10 animals. As such the *intensity* of blizzards also varies along a temporal and spatial scale. Although blizzards can be viewed as seasonal or annual phenomena, i.e. the temporal scale is relatively known, and therefore relatively predictable, blizzards are unpredictable for individuals within this system due to the spatial structure of the phenomena, i.e. site-specific differences in the area. There is no way for a household in the Aru basin to predict where (or exactly when) the next blizzard will occur, and thereby take its precaution. As such, food production within the Aru basin can be viewed as highly unpredictable. However, the extent of livestock losses experienced by the nomads in the Aru basin needs further investigation, and some historical data concerning livestock numbers have to be obtained in order to show the extent of livestock fluctuations.

As indicated, it is probably more useful to refer to blizzards as natural events, something that is part of the environment nomadic pastoralism in the Aru basin have lived with for many years. From an ecological point of view, blizzards can be viewed as a regulatory mechanism, since periodic heavy snowfall reduces both the number of livestock and wildlife that use the rangelands, thereby providing time for the rangeland to recover after possible heavy grazing (Miller, 2000). As such it is possible to argue that the Aru nomads ability to cope with blizzards and other ecological factors "[…] may be viewed as the minimum necessary conditions for survival and, as such, integral to normal existence." (Halstead & O'Shea, 1989: 3). However, no matter how integral parts of the system blizzards are viewed to be, they have to be dealt with by the nomads, since they increase production risks conceptualised as "[…] marked unpredictabilities in the number and quality of animals and animal products." (Göbel, 1997: 41). As a consequence, what I have termed 'cultural responses to variability' and 'strategies for countering risk' becomes interesting, since the question can be raised as to how the Aru nomads manage to make a living within this system?

11.4 Cultural Responses to Variability

The logic of any given risk reducing strategy is to minimize the impacts of risk and to reduce uncertainties (Bollig & Göbel, 1997). Although, four strategies for countering, or minimizing, risk were described in chapter two, (a) diversification, (b) exchange, (c)

mobility and (d) storage, only (a), (b) and (c) have relevance for the Aru nomads, since e.g. storage and mobility can be in conflict, i.e. any successful storage of food requires limited mobility.

Two examples of diversification was discussed, namely (1) herd composition and (2) hunting.

11.4a Herd Composition

The underlying logic of keeping herds consisting of multiple species is that faced with the possibility of losing large percentages of their herds, keeping sheep, goats and yaks, can have some advantages since they have a different tolerance with regards to snow, and snow related problems. For example, yaks can survive longer than sheep and goats when the grassland is covered by snow. Also, according to the nomads a blizzard has to be of greater intensity to kill yak in the course of one night, than for sheep and goats. Also, if one species experiences great losses, another of the available species can, to some extent compensate for this loss.

The different species also make use of different kind of forage, making the use of the grassland more effective. On the other side, this also place constraints on what kind of species one area can uphold. For example, Goldstein & Beall (1990) argue that the relative low proportion of yaks in the Phala area is probably connected to the amount and quality of vegetation available. However, the reproductive ability varies between different species, and it is therefore reasonable that the Aru nomads keep more sheep and goats than yaks since, although yaks can be said to be a more constant resource for the Aru nomads, yaks reproduce slower than sheep and goats, in spite of being fertile for a longer period of time. Consequently, a herd consisting of mainly yaks will take longer time to rebuild if a disaster reduces the majority of a yak herd. On the other hand, economic considerations are also a factor, since different species provide different products and quality of products. Sheep for example produce meat, wool and milk that is preferred by the nomads, while goats produce milk for a longer period of time, cashmere wool which they can sell on governmental markets, and also meat. Yaks produce much more meat than sheep and goats, and also produce milk for much longer periods of time. Also, yak wool is important in the making of the Aru nomads' tents.

11.4b Hunting

Probably the most important way for the Aru nomads to minimize the impacts of risk and to reduce uncertainties, or the best 'strategy for countering risks' was by hunting. The Aru basin has traditionally supported, and in general continues to support, an abundance of wildlife species such as chiru, wild yak, blue sheep, Tibetan gazelle and kiang. The nomads primarily hunted the chiru, mainly to obtain meat but also to trade the skins. Pelts from the chiru were traditionally traded to people from Ladakh in India, from where they were transported to Kashmir and the fine shatoosh wool was woven into high quality shawls (Schaller, 1998). They also hunted wild yaks, from which they used the meat and made shoes of the skins. Blue sheep, Kiang and Tibetan gazelle were mainly hunted for meat. Some people also used the skins from blue sheep to decorate their dresses, and some monks bought the skins because they made good material for making drums. Hunting functioned as a risk reducing strategy in two ways: On the one hand the Aru nomads hunted so that they could reduce the capital offtake of their herds, and thereby decrease the probability of falling below a minimum subsistence level if disaster struck. On the other hand, hunting was also a means of reducing the effect of disasters, in that when livestock was lost due to e.g. a blizzard, they could compensate for this by hunting, and avoid cutting into the capital.

11.5 The Organisation of Labour

Another subsystem and its relation to risk under discussion, is *the organisation of labour*. Göbel (1997) argues that bottlenecks in the availability of the work force, has to be considered as a risk factor in pastoral production systems. The number of people in a household both plays part in the optimal care and control of the herd, and thereby the optimal use of the animals. Bottlenecks in the availability of labour can be connected to Stenning's (1958) term: 'family development'. The number of personnel (consumers and producers), i.e. labour contributors in a pastoral nomadic household will change throughout a household's lifetime, i.e. the term refers to cyclical changes in the size and composition of viable domestic units. Newly established households and households where members have either died or moved out, can be viewed as being 'unviable', viability referring to herds as being of large enough size for the household to subsist on it, and that there are enough persons able to manage the herd optimally (Stenning, 1959). Or with Paine (1972 & 1994) words, viability can be described as having the three factors of pastoral production in commensurate proportions, i.e. herd, pasture and personnel. With regard to

labour, incommensurability can arise if the number of people involved is too small to take care of the animals. On the other hand, small herds can also possible lead to incommensurability, e.g. the herd is too small to provide food for the consumers that rely on it. As previously discussed, hunting solved this. Small herds also tend to break up and become easy prey for predators, giving the herders a problem regarding *control* and thereby increase the risk of losing animals. However, a household's need of labour does not only depend on where it is in its life cycle, but also on changes throughout *seasons*. Seasonally, late spring and early summer is the most demanding with regards to labour since this is the time of wool shearing and milking.

The way the Aru nomads solve this problem is by forming *herding groups*. Usually a herding group consists of 2-3 households, which share the responsibility for the daily herding. The formation of herding groups both makes the daily herding easier and is labour saving for the individual households. In other words, by joining other households in herding activities the Aru nomads attain commensurability between herd and personnel with regard to labour, *without increasing the numbers of consumers*. As such, individual households also attain viability, since member without herding responsibilities can pursue other necessary activities. This established a distinction between household and herding groups on the basis of Paine's (1964) terms herding and husbandry. Herding concerns the welfare of the animals in the terrain, while husbandry on the other hand, relates to "[…] the herd as the harvestable resource of its owners" (Paine, 1964: 79). As such, husbandry has to do with individual households, and herding with herding groups. With recourse to the risk framework we can say that the formation of herding groups *relates to the exchange of labour in connection with the welfare of the animals in the terrain and freeing up members to pursue other subsistence activities, without increasing the numbers of consumers, i.e. households attains viability.*

11.6 Mobility

According to Paines (1972 & 1994) concept of commensurability The Aru nomads should move and settle according to a system that takes into account the heterogeneity of their grazing area, i.e. movement patterns have to take advantage of the spatial and temporal structure of resource distribution in the total available grazing area. If an area cannot sustain the number of animals grazing on the area, incommensurability between pasture and herds will be the result, and possibly have detrimental effects on animals' welfare, i.e.

the risk of losing animals will increase. As such, settlement and movement patterns can be viewed as chosen in order to attain commensurate proportions between *animal numbers* and *pasture*.

A differentiation between *seasonal* and *in-seasonal* movement patterns have been discussed. Seasonal movements can be viewed as relatively predictable since the Aru nomads have split their total available grazing area into seasonal grazing areas. The underlying logic of this is connected to the growing season of the grassland; re-growth only occurs from late April to mid-September, making it imperative that there are some areas set aside for later use with vegetation left when the growing comes to an end. This indicates that the Aru nomads have extensive knowledge regarding the heterogeneity of their total available grazing area, i.e. they have to know which areas that have the best quality and amount of grass. Also, it is important to consider the spatial and temporal structure of climatic phenomena, such as snow, since having the winter grazing area in close proximity to mountains, which often experience more snow than areas at some distance from mountains, increases the possibility of losing animals. On the other hand, the underlying logic of in-seasonal movement is connected to reducing the probability of hazards occurring, i.e. in-seasonal movements are usually decided on the basis of the daily monitoring of climatic events. For example, the Aru nomads sometimes have to move away from snow affected areas during summer, and as such minimize risk. As a consequence, in-seasonal movements are unpredictable.

As for settlement patterns, they are mainly determined by 1) *quality* and 2) *amount* of grass in any given area. However, settlement patterns are also influenced by the availability of labour. In general, the largest number of households living together is determined by the amount and quality of grass, while the smallest number of households living together is decided by the availability of labour, since there is no use taking advantage of a grazing area that can only support one household, if this household does not have enough labour available to manage the daily workload.

11.7 A System in Change?

Although the total ecosystem and the sub-systems as just described in the Aru basin can be conceptualised as closed, i.e. independent of outside forces, I have viewed it as an open

system since the production system in the Aru basin is influenced by macro-political and macro-economic decisions taken outside of the Aru basin. Three examples have been discussed, namely (1) cashmere wool production, (2) the ban on hunting, and (3) change in movement patterns.

11.7a Cashmere Wool Production

The increased importance of cashmere wool has been used as an example to show the increased integration into a market economy, and dependence on cash among the Aru nomads. Traditionally the Aru nomads preferred sheep to goats but, as shown, this is about to change. This change can be related to a change from a 'traditional' subsistence and surplus for trade economy to a 'modern' subsistence and surplus for cash economy. The Aru nomads have always produced surplus products traded to obtain necessary products such as tea, barley etc. However, the traditional surplus products that were traded were mainly that from sheep and, to some extent yak. Today, the most valuable product sold for cash is cashmere wool. As such, the production system can be viewed as changing from a mainly sheep oriented economy to that of goat. This is reflected in the nomads' preferences, while they still value sheep products for own use more than goat products, they now place more value on goats, for as they say cash can be used to buy anything. This can be viewed in the connection with Paines (1994) terms of 'intrinsic value' and 'market value'. As such, sheep can still be viewed as more valued than goats within "[…] the domain of "subsistence" economy […] ", i.e. their intrinsic value is higher, while goats are more valued in the domain "[…] of the market economy and its culture […]" (Paine, 1994:15).

Although this is not as clearly represented in the herd composition of the Aru nomads herds (7:3 sheep goat ratio) as that of Phala (1:1 sheep goat ratio, Goldstein & Beall, 1990), it is probable that this will change in the nearest future if cashmere wool prices continue to be high since almost 70 percent of the Aru nomads cash income derives from the sale of cashmere wool. Also, it is probable that the relatively large percentage of adult male goats and sheep (1:1 ratio of male/female goat and sheep) is connected to the importance of cashmere and wool production for sale on governmental markets.

While some researchers have criticized the integration of nomadic pastoralists into a market economy causing undue stress on their economic livelihood (Khazanov, 1994), I

prefer to view the market as a way for the Aru nomads to *create new ways to diversify risk*. From this perspective, the increasing importance of cashmere wool can be viewed as giving them new opportunities instead of decreasing their choices. This can be viewed as a safety measure for nomads, during years when they get high prices for cashmere wool, households do not have to slaughter too many animals, since they can buy some extra food. Nevertheless, cashmere wool production is an unpredictable and variable enterprise, since price changes greatly influence the nomads' level of income.

11.7b The ban on hunting

In the early 1990 a ban was declared on all hunting in the Chang Tang Nature Preserve. The nomads who until then had relied on hunting as means of subsistence diversification were now suddenly faced with a dramatic decrease in income, both because the sale of antelope skins had contributed substantially to their cash flow (the "shatoosh" trade), and because they had relied on hunting as supplementary source of meat. The nomads emphatically stated that their livestock did not provide enough products for them to live well off, neither directly through own consumption, nor indirectly through the sale of livestock products.

In this thesis, hunting has been viewed as a low-level mechanism for countering risk. As such, the ban on hunting has had a dramatic effect on the ability of the Aru nomads to cope with unpredictable ecological factors, since no other means of compensating this loss in subsistence diversification has arisen. As such, one macro-political decision, i.e. the ban on hunting, can be viewed as having increased the risk of falling below a minimum subsistence level in the Aru basin. The increased importance of cashmere wool can be said, to some extent, to have dampened this effect by providing the Aru nomads with another way of decreasing production risk. However, unlike hunting, the income from sale of cashmere wool depends on the numbers of animals a household has, and as shown, this can greatly fluctuate. Also, prices can fluctuate dramatically from year to year; making the Aru nomads cash income vary accordingly.

As such the pastoral production can be viewed as being in imbalance due to the ban. This can be discussed with reference to system theory and the problem of *change*. Systems are usually viewed as self-maintained and self-regulating, implicated by the term *homeostasis*. Homeostasis has, according to Moran (2000:58), been defined in the past as "[…] the

tendency for biological systems to resist change and to remain in a state of equilibrium" which has "[…] led to an overemphasis on static considerations and to an evaluation of man's role as basically disruptive." This view has somewhat changed and Moran (2000:344) differentiates between *dynamic equilibrium* and *static equilibrium* in reference to homeostasis. Dynamic equilibrium refers only to "[…] properties essential to the continued existence of the system" and takes into account both negative and positive feedback processes, *regardless of the level or state of the system* (Moran, 2000:344). This term also implies the possibility of *change*: in response to disturbance parts or even the structure of the system can be adjusted or change. Static equilibrium on the other hand "Deals only with the processes of negative feedback that help maintain the system at a given level of existence.", i.e. a steady state (Moran, 2000:344). These views can be compared to theories within biological ecology that differentiates between the concept of *equilibrium* and *nonequilibrium* in ecological systems. Whereas the first can be compared to the previous discussion on homeostasis and static equilibrium, i.e. ecosystems seek to regain a lost balance when disturbed, the nonequilibrium theory claims that ecosystems can change from one state and assume a new state upon being disturbed (Meffe & Carroll, 1997)

As such the ban on hunting can be viewed as a disturbance to the overall production system. What the long term consequences of this, i.e. whether the system can change and assume a new state or not is at present unknown. Another consequence of the ban is that the Aru nomads have started to perceive wildlife, and then especially the chiru, as competitors to their livestock regarding forage. Consequently, some nomads now feel a strong resentment towards wildlife, while previously wildlife was looked upon as something valuable.

11.7c Change in Movement Patterns

A typical disequilibrium system, like in some places in Africa, is the result of unpredictable droughts reducing the amount of vegetation. As such, the carrying capacity can be viewed as changing, depending on climatic factors, causing the number of livestock using the rangeland to fluctuate. Now, this is not the case in the Aru basin, and most likely not in other parts of Tibet. Here, it is not the amount of vegetation on the rangeland that is critical, but its *availability*. Unlike droughts, snow only cover up the vegetation, and when the snow has disappeared the grass is again accessible in a more affluent state for animals.

On the other hand, this difference is of no consequence for the nomadic pastoralists inhabiting this area, since the result is the same: *unpredictable fluctuations in livestock numbers*. As such, *the pastoral production system* can be viewed as unpredictable in the same way as in Africa.

As been discussed, it is not known whether the rangeland system in the Aru basin, and more generally in Tibet, can best be described as a system in equilibrium or dis-equilibrium. On the other hand, according to the dis-equilibrium model, pastoralists should have flexible access to large areas of land, and that by being mobile, pastoralists are likely to be more efficient than if they are allocated a limited area of. Whereas in traditional times, the Aru basin was only used seasonally, today nomads use the basin permanently and intensification in use is likely. What the long-term consequences of this change in grazing patterns are unknown, but Humphrey & Sneath (1999:292) argues that for Mongolia"[…] pasture degradation is associated with the loss of mobility in pastoral systems." However, a return to more traditional system of mobility in the Aru basin and the surrounding areas is somewhat hard to imagine since areas outside of the basin are already in use by other nomadic pastoralists.

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