SINDH ITS FOOD RESOURCES SINCE ANTIQUITY

(A pre-Neolithic socio-anthropological study)
Animals, Birds, fishes and wild horticultural products

By
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Hunters in most of the parts of the world had to spend most of their time in gathering food for bare subsistence. The storage of meat, fish or fruits could be done only for a very short time. They had thus to live on the edge of starvation and fear of extinction. The Sindh hunters must have maintained a relatively high standard due to abundance of big game in the riverine forests, fresh water fish and game birds. They did not lack the supply of flint tools, for which factories existed in the Upper Sindh at Rohri, in the Lower Sindh at mile 101 and in the whole of Hilly track of Kohistan in South Western Sindh. The mastery ever chipping and shaping of crystalline rocks had already been achieved by Palaeolithic man between 30,000-10,000 BC., and the art must have come to Sindh from Soan valley as well as from Decan soon after 15,000 BC when sea started receding from the alluvial planes of Sindh near present Kashmore. They most probably made artificial shelters in the alluvial planes and used rock over hangs as well as caves in the Western Sindh. For shelter they must have made use of animal skin, by hanging them from trees or fixing them on poles like a tent. The skins must also have been used for bed, mattresses and etc. Straw from various grasses, feathers and fibres must have been used as cushion material. Rice straw is still in common use in temporary farm dwellings for thrashing season in Upper Sindh. It is erroneous to think that the Sindh hunter worked around the clock to feed himself. The hunter must have been as efficient as great apes and lions, who enjoy long periods of grooming, playing, resting, napping and relaxing after an intense activity of food hunting or gathering. Even today hunting adult bushmen on the average spend only 3 hours a day to collect food for them-selves and their off spring or the elderly and the sick.

The food gathered by them was rich in proteins and other essentials. As against this today's Sindhi farmer has to work about 53 hours a week or 7 ½ hours a day yet to live from hand to mouth. Before the world war-II, a Sindhi farmer was getting animal protein twice or thrice a week, but today it is only seldom in months. The Western Europeans and northern Americans of

today probably are to get slightly better food than Sindh's hunter, that by putting in weekly, 40 hours at work another 20 hour at home, but they have little time left or leisure and pleasure.

Sindh Hunters must have maintained almost a constant population for many milleniums. The birth rate among the hunting tribes is always low. The density of population in most of stone-age world was about one to two person per square mile, but in the Sindh's thick forests which must have occupied approximately 25000 to 30,000 sq. miles, the availability of Pala (Hilsa) and other fishes the river Indus, big game animals and birds, the density could have been at least 4 to 8 persons per square mile and this must have continued well upto Amrian times, when farmers started clearing forests land for agriculture. It took at least half a millennium for the agricultural tribes to penetrate deep into the riverine forests and clear them for agriculture. Since a unit of land can absorb more agriculture labour and also sustain it than it can support hunting and food collecting; in the process lasting these 500 years or more, the population of food-gatherers must have reduced and been replaced by the agricultural population. It must have amounted to a change of occupation by substantial portion of hunting population and the rest of agricultural labour and the pioneers may have migrated from other settled farms, due to increase in population.

Agriculture also needed more labour force as man hours required to produce a unit of food calories from agriculture is more than man hours required in hunting-food gathering. The agricultural economy therefore is strongly motivated to increase the population and the hunting economy on other hand is motivated to keep their population low in relation to their available animals for hunting. The hunting and food gathering population of Sindh which may have been constant upto approximately beginning of 4^{th} millennium B.C., started reducing due to switch over to new economy of raising crops. In a century or two or possibly more the new farmers reached the Indus planes at Amri and established agricultural economy. This must have threatened the hunter-food-gatherers, who either may have adopted to new economy or reduced their population. It is un-true that the rate of mortality among the hunters was high. The death caused by infectious diseases like cholera, tuberculosis, pneumonia, typhoid, small pox, plague and etc., is strongly influenced by the food and general health, and therefore hunter-food-gatherers who get better diet, certainly must have high recovery rate, besides the above are the diseases of high density populated societies, poverty, under nourishment, over crowding and unhygienic conditions. Disease like malaria reached its zenith only after the forests were cleared for agricultural doing away with natural drainage and creating swampy conditions for mosquito breeding. Thus the agricultural economy caused general depression of human health.

From the skeletal remains of past thousands of years it is proved that with the advent of agricultural economy the general health of people deteriorated

for example in 30,000 BC adults died with 2.2 teeth missing, in 6500 BC it rose to 3.5 missing and around 2000 BC with 6.6 teeth missing I.

The birth rate among the hunter-food-gatherers is always lower than in agricultural population. The reason being that after the birth of a child, a woman does not ovulate and thus get pregnant unless she has accumulated more than 20-25% of her total body weight as fats. Since a nursing mother also supplies about 1000 calories to her suckling child, a woman in hunting societies depended on proteins, takes longer for the accumulation of fats to the required level, whereas in agricultural economy the carbohydrates from grains and yellow vegetables quickly provide the desired level of fats for ovulation. Thus to long as the hunting society women suckled their children, they rarely got pregnant. Not only this but higher the ratio of body fats to body weight, earlier is the age of menarche. Thus in well fed societies taking diet rich in fats the girls can ovulate as early as at twelve years of age.

The life expectancy among the hunting tribes of Sindh like others may have been 28-32 years and the hunting tribe women may have produced maximum 3 to 4 children in their life-time at age of 18, 22, 26 and 30 years, unlike agricultural population of the Indus Culture times, when they may have produced possibly 8-9 children during the same life expectancy. Accounting for high child mortality rate the population growth among the hunting tribes may have been a maximum of one percent and even as low as half percent as against about 1 ½ to 2% for agricultural population inspite of high mortality. The agricultural population would therefore double in 35-52 years, whereas the hunting tribes would take 70 to 139 years for doubling their population. With better food, rich in proteins, the population increase would be low and with poor diet stuffed with carbohydrates like rice and potato the population would rise quickly.

The hunting tribes had another method of population control, by eliminating the girl babies by neglect. This was and still is common practice in all under-developed countries; rural areas of Sindh as well as whole of Pakistan being no exception.

The tools produced by Early Stone Age people in general show stagnancy. It is only between 30,000 BC and 10,000 BC that the man perfected techniques for making tools from stone. The earlier man had no means or know how, to kill large animals, and he most probably was a scavenger, living on animals which met a natural death, or wounded by his non-human hunters. With evolution of new tools the man was able to kill large animals regularly.

Whereas in most of the world by about 11,000 BC large animals like mammoth, rhinoceros, bisons, wild goats had started becoming extinct due to the end of last phase of ice, age, which caused change of climate and the encroachment of forests on grass lands on which these animals lived. In Sindh the same period marks receding of sea and opening up of new lands

covered with grass as well as forests, it became a new haven for animal world as well as for man. So much was the dearth of big animals, that in Europe the people started getting their protein from fish, shellfish, small forest species like deer etc., and in the Middle East (Iran and Turkey included), man was preying on smaller animals like sheep, goats, antelope and birds and gathering wild grains, wild nuts and even wild legumes. In Sindh no such dearth could be expected as the forested and grass land would have a minimum width of fifty miles and in some areas more than 100 miles. The fish and migratory birds of Siberian origin would always be at hand in the river, the lakes of Manchar, Chotiari, Makhui, Hamal Kalri and large number of other lakes formed by changing courses of river Indus.

If man in Sindh lived on mamalion animal protein only, he would need, about 12 medium size animals to keep him alive for a year. The Thar desert of Sanghar and Mirpurkhas district is able to sustain 400,000 animals in its depleted condition even today. It would have supported twice as many animals, when conditions, were wetter. The Thar and Pat both together possibly could have supported 1,000,000 animals which would be ready for slaughter after they became 5 years old.

This would make available 200,000 animals annually and support a population of 16,600 people. Wild food gathering, from horticultural plants, roots, creepers etc., trapping of birds like peacock etc., would have supported another 3,333 people making it a total of 20,000 people for whole Thar of Sindh.

The hilly track of Sindh would have support another 20,000 people on the same analogy.

The Indus plains in Sindh with its forests and grass lands would be capable of supporting at least 10 times the population of Thar or Kohistan per square mile. But the whole plane was not available as hunting fields as by about 10,000 BC sea level was near Ruck and by about 6000 BC it may have receded to the south of Hyderabad. Thus the full colonisation of Sindh by hunting tribes must have been delayed to about 5000 BC when the sea level may have been near present Matli or Talhar. By that time the plains may have supported minimum four person per square mile making population of planes around 80,000 persons, though it could easily support upto 200,000 people. Thus the total population of Sindh may have been of the order of 100,000 to 120,000 people. This definitely is much higher than average figures of about 1 person per square mile for the rest of the world as supposed by authopoligists, but Sindh must have been capable of supporting this population, due to the Indus Hakra forests and grass lands.

The process of switching over from animal hunting to collection of food from plants and finally domestication of plants did not start in Sindh, as there were enough animals around to support a population the optimum figure of which was never achieved. Elsewhere in the world this switch over was out of

shear necessity. In most of ancient world the percentage calorie contribution from the domesticated plants slowly rose until a time came when this source provided a major portion of human requirement. In the initial stages of this process the plant food must have been mainly horticultural, but later on domesticated grains and ultimately irrigated agricultural carbohydrates and proteins must have been substitutes for animal protein and fats. In most of the old world agriculture came much after colonisation of area and at least 2000 years before domestication of wild plants, whose seedlings they were collecting for centuries. This is proved from excavations in Middle East. In Sindh the hunters must have fully known the cycle of plant growth, but due to adequate supply of animal proteins never started growing the plant, though they must have collected specially the horticultural, products like Ber, Peroon, Delha, Nimuryoon, Singhariyoon, Moth, Gedoora, Keerya, Paban, Ghanghbeti, Chibhir, Kuni, Mitera, Kohir, and root products like Lorh. Bith, Pharsir, and Kum, etc., for many a Mililani before some tribes were to start agriuclture. These new farmers too first built villagers to provide along with shelter for themselves and their cattle, storage space for the grains they were to produce, grinding it to flour, and baking or cooking it to meal or porridge. These accessories were the capital investments which could not easily be abandoned. This information is already available from Mount Carmel (Israel), Mallaha (Jordon River valley site, 10,000 BC) Zawi Chemi, Shanidar (Iraq in Upper Tigris, 10,000 - 8,000 BC), Karim Shahir (Iraq at the foot of Zagros Mountains, 1000-8000 BC), Tel Mureybat (on Euphrates river in Syria, 8000 BC) and finally from Mehrgarh in the Indus plain, south of Sibi (7,500 BC). At the Tel Mereybat clay walled houses, roasting pits, grinding stones and 18 different types of wild seeds including the ancestors of wheat and barley have been unearthed besides peas and tentils. There is also an evidence of domesticated sheep and goats. Similar are findings for Mehrgarh.

In Sindh the hunter-food-collectors did not start agriculture earlier, not for the lack of know-how but due to abundant supply of meat, wild fruits and vegetables, which were gathered by a few hours work in a week instead of devoting long hours of the day spent in agricultural food production. The hunting tribes may have had domesticated animals. Loads were handled possibly first on the back of animals, later on by sledges, them on rollers and finally by the use of the wheel. The use of wheel in pulleys, gears cogs, etc., for lifting hacking, milling and etc., was a development, consequent upon domestication of draft animals. So much was utility of this type of animals that they were fed even on food-grain, which was completely denied to the meat and milk animals and is the practice in Sindh even to this day.

The process of domestication must have started in Kohistan and Thar areas first, where animals to survive must move from one grass land to other in different months or seasons of year and must move to some watering point, a spring, stream or tarai, and in years of draughtmust move to adjoining plain's. Without human help this would be difficult, specially when aridity invaded those regions.

Agriclture in Sindh came from within and from without. In the Kohistan and Indus planes, it came from Mehrgarh and in South Eastern Tehsils of Thar desert it probably came from South India, but the contribution of the later must have been limited in extent and insignificant in influence specially after Amrian times due to nearness with the Indus plains, where agriculture was fully established.

The hunting tribes must have had un-written but mutually agreed extra-territorial rights to exploit an area. A band of hunters as all over the world may have consisted of 30-40 people, living together and occupying a stretch of the area capable of supporting its numbers. In case of disputes there may have been wars, but lacking bureaucratic apparatus of governing the other lands, territories or taking prisoners and making slaves of them was not practical, specially as the land would have to feed extra mouths. These wars therefore invariably were a compromise on territorial rights. Besides this they sometimes needed co-ordinated effort to hunt a flock of animals passing through their territories to the other areas. If and when a war did take place the victors had no gain, except to boast about how bravely they fought the battle. In case of war they however did damage to the enemy, by raids, destruction of settlements, causing flight of animals and there by reducing the population density of the area.

The population growth was considered a serious problem by the hunter-food collectors, to which they too had an answer.They knew that fertility of group is determined by the number of adult women rather than men. The data available from the Harams of some super rich Middle Easterns show that one man is capable of producing 500 children in his life time if supply of adult female wives and concubines is adequate. This being understood by the Hunter-food-collector, they would nor kill the enemy males and accept their women and children as slaves and create population explosion. Even in their own groups they resorted to female infanticide by neglect, abuse, or outright murder, though from experience they knew that as horticultural food gatherers, a woman collected more calories of food per head than a man did as hunter in a working day.

The population control assured the Stone Age man of Sindh a decent subsistence living, without risk of depleting his food source. In terms of food value, meat has twenty amino-acids, which is protein. These are available in plants but not all of them in one plant and mostly only a few in each plant. To get daily balanced supply of protein one has to take a number of plants as food, including quantity of beans, nuts, root crops and grains, some of which cost more than meat. The hunter therefore was more healthy and vigorous. To maintain this standard of health, he had to have population control so as not to deplete the Shikarghas or the hunting grounds.

With the rise of agriculture, there came the necessity for greater co-operation specially to combat resistance of hunting tribes, who must have fought against encroachments. Such co-operation was known and must

have been practised. State control have been produced developed along with agriculture in turkey, Israel, Jordan, Iraq and Egypt. The hunting tribes of Sindh must have been hopelessly divided on Shikargahas and were unaware of proper weapons and techniques of war, as well the organised aggression. They must have yielded very easily though gradually, as their Shikarghas were converted into agricultural land. Then they must either have migrated elsewhere, or accepted new profession, first as labourers and later on as peasant-cultivators, doing away with their own hunting grounds. Some hunter-food-gatherers may have switched over to mere fishing, birds catching, horticultural food gathering and occasional animal hunting, and made way for intruders, who had a bureaucratic machinery to govern lands they vacated.

Thus for the first time he accepted kings, dictators, priests, police, taxes, legal punishments and slave labour. The agricultural revolution thus ended the freedom of Sindh's hunter-food-gatherer and imposed on him despotic slavery. The beginning of this despotic rule of state must have started in the Indus valley with Amri around 3500 BC and must have been fully established very soon; though it had taken roots at Mehrgarh much earlier and in Mesopotamia and Egypt around 3300 and 3100 BC respectively. It moved to yellow River basin of northern China soon after 2000 BC. Americas had to wait for its first state government until about 100 AD.

Agricultural diets rich in carbohydrates would increase birth rate and population growth. To relieve them-selves of reproductive pressures, the agricultural communities, intensified agricultural production, first by extensive and later by intensive cultivation. Forest clearance, and alluvial soils of Sindh, would have yielded both results quick enough for population growth.

The state must have been interested in the process and must have nominated agricultural production intensifiers, who later on became known as Waderas or big-men. The Indus state was interested in collecting agricultural products and redistributing them among the non-agriculturist. It also supplied seed if and where needed. For collection and re-distribution in deficit areas they had to depend upon the Waderas, who thus kept getting more and more powerful at the cost of both the grower and the consumer.

The other impact of agricultural revolution was the population increase. The land was able to support more population per unit area than the hunting grounds. Most of population of Sindh must have concentrated in the alluvial planes. The population increase must have been very slow since Amrian times, it must have gain some momentum by Kot Dijjian times, but the real boost was to come with Mature Indus culture. The population of Egypt had doubled between 4000 to 3000 BC. It is safe to assume that population of Sindh doubled between 3500 to 2500 BC and became 250,000 people. In next 500 years it must have become 500,000 for Sindh's alluvial planes alone.

With the rise of state in Sindh various functionaries of government needed strict discipline, which women could not undergo due to pregnancy and post-child-birth care. The state functions became man's monopoly and the status which hunting-food gathering women had enjoyed was lost. She became inferior, which next 5,500 years struggle has not been able to restore to her again inspite of support from socio-religious organisations.

The initial form of agriculture in the Amrian and Indus times must have been slush and burn system, which meant that forest was cut down, allowed to dry and then burnt. On this agricultural crop is grown for a few years, then land is left fallow, for trees to grow again attain good height, when they are cut again. Burning is to be carried out just before the inundation season, for silt and water of rising river to bury the organic material. On this porous soil crops could be grown without further seed bed preparation. Occasional harrowing would be sufficient, and thus the Indus people had a harrow. The weeds too would be low for a few years, when a new plot is to be found. The slush and burn soil give high returns, provided there is enough time interval for trees to grow and provide enough organic material for new seed bed. This system, is still in practice on small scale for rice nurseries and in of Sindh.

The slash and burn system may have come to an end by about 2000 BC. When to continue the system must have proved inefficient. By that time Sindh's population must have reached 500,000. The irrigation system then must have been only rudimentary. The cycle of slush and burn on some plot must have became too frequent, the fertility may have gone and so the yields. The population in search of new land must have moved out of Sindh a century of two earlier, first in the Sarsuti-Hakra basin and later to Kutch and Kathiawar. The slush and burn system had another advantage. They could have destroyed the Shikargahs of hunting tribes in quick succession that would otherwise have been difficult in view of counter-measures by the latter.

The hunting food gatherers must have domesticated some animals, but did not resort to animal husbandry. The tribes that migrated to Indus plains before and during Amrian times were essentially animal husbandry people interested in pasture and initially took to agriculture not as main profession but as side food source, but seen they found that, as food producing economy, animal husbandry needed more man-hours, than grain production of a calorie of food. Of the photosynthetically sun-light falling on the plant only 0.5% is converted into edible matter. If grain is fed to the cattle, only 5% calories in it are converted into meat. With this poor efficiency of animal system, the switch over from pastoral to agricultural economy specially in the riverine areas of Indus was quick, but the pastoral grazing on large scale survived, right into the this century; the animals thriving on wild grass, agricultural bye-products and stubles, not consuming the grain and thus not competing with human being for food.

The animals so raised were primarily not for meat but to support agriculture as well as to provide human food and other utility bye-products. Some of them like cows and buffaloes provided continuous supply of proteins, carbohydrates and fats in the form of milk, and if its bye-products. The bulls were the draft animals. Sheep and goat provided fibre before they were killed for meat. Once domesticated, camel, horse and ass were pack and riding animals. Their slaughter was only done, when they could not be utilised otherwise due to old age or physical deformity. As a draft animal, bull attained the highest place of almost of god among the domesticated animals of Indus culture. He was worth much more when alive than if killed. This process of conserving domestic animals and eliminating the undomesticable (pig an exception) was to continue through out the Indus culture and after until many species became extinct. Thanks to the efforts of the British in South-Asia to protect wild life, which had survived 5,500 years of human butchery. The increase in population, decrease in forest and grass lands, domestication of animals for utility other than meat, the meat slowly started disappearing from daily food and finally in the South Asia, eating of meat became a religious taboo, and living on the plant food a virtue to be rewarded by God.

Pig was an animal very well suited to the forests and river banks of Sindh, where it is found to this day. As it cannot sweat, it regulates its body temperature by remaining in shade, and water. As food it lives on tubers, grains, fruit, roots and nuts (which fall on the ground) all of which are human food. It can gain about 20% of this rich feed, into fat and meat, as compared to 5-7% for other animals, but when compelled to eat grasses it cannot gain even a small percentage of feed which other animals do. Like human beings it cannot digest (or even eat) straw, stalks, husks and fibrous leaves. In brief it is direct competitor of human beings for food. During the Amrian, Kot Dijjian and early Harappan time it was probably domesticated, but as soon as food difficulties for human being appeared, it was quickly removed from the list of domesticals and the wild pig was hunted down. The Israelis faced the same problem around 1200 BC and made eating of pig a taboo. In Sindh it was not a taboo, eliminating of wild pig and eating it continued well for many centuries, even during the Buddhist hay-day in Pakistan, when catching and eating of pig by the lower castes (chusras and others) was tolerated and so it continued throughout Muslim rule, main purpose being to eliminate it, to save the crops. As late as sixties of the last century a programme was launched by the agricultural department in the Punjab awarding reasonable reward for killing of wild boar. The Israelis eliminated the temptations of raising of pig by declaring it as unclean, whereas the Indus and Post-Indus people declared it as harmful to crops and called for eliminating it, thereby encouraged raising of grains, tree crops (for human and animal feed) and other animals at cheaper rates. Egypt faced the same problem as Sindh. Though they allowed raising of pigs, but the swineherds were a despised caste according to Herodotus. As really as 2000 BC Egyptians had identified pig with god of evil. Pig was eaten in Mesopotamia upto 2400 BC, but disappeared soon after due to depletion of agriculture. Cats and dogs were

domesticated as the former helped in eliminating rodents from houses and grain stores. Dogs were used as hunters and watch dogs. Hunting tribes of Sindh had domesticated the dog for the same purpose. The use of dog as pet animal alone as it is today must have been limited or unknown.

In all probability the Indus hunters did not catch lions, wild cats, foxes, and woves in general, as they are difficult to kill, skinny, scarce and would return a very small quantity of meat as compared to the trouble of capturing them. The hunters of Sindh must have captured all kinds of fishes specially Hilsa or Pala, shell fish, whales and etc., and also tortoises, which are still captured and eaten by Balas a nomadic aboriginal tribe wandering in Sindh. the same people catch and eat jackals and foxes, tortoise and other reptiles, Egg collection for food must have been done too. Among the insects most probably the locusts (when they visited) were killed, dried, stored and eaten, as protein supply, but this must have been only in desert and Kohistan and may have been introduced in alluvial planes during and after the later Indus period when meat crisis occurred. Among small animals rabbit may have been captured and eaten as today. The pack animals too were eaten when no longer in use as such, Milk of camel must have been utilised as is common among Jats of Sindh even today. It is conjectured that Jats are descendants of Harappan people.

The decline of Indus civilisation was due to increase in population and reduction in the fertility of soil. The Forests had been cleared, slush and burn could no longer be practised, yields fell, with corresponding decrease in nutritional standards and consequently ill health, diseases, demoralisation, and fall in population, which in turn further reduced areas under cultivation as well as yields per acre. Soon after the decline culture people the population of Sindh must have declined fact to about 250,000 or even less. the Cemetery-H people were not urban people, lacking beaucratic machinery to co-ordinate the agriculture production, which may further have been reduced. The process must have continued for 750-800 years or so when the agriculture may again have gained momentum.

The Rig Vedic Aryan who emerged in Swat, after 1050 BC and the border of Sindh by about 850 BC, were not able to penetrate Sindh, primarily due to difficult geographical terrain, below Kinkot, where Indus bifurcated into two branches and flooded most of the country in the summer months. Aryans were primarily pastoral people, and Sindhis agricultural. The two people belonged to the same race, spoke languages which were closely related and appeared to have accepted coexistence.

Aryans were meat eaters principally of cow, goat, sheep and buffalo. Beef must have been readily available in Sindh due to large pastures caused by encroachment of riverine forests and grass land on the agricultural land since fall of Indus civilisation. The hunting food gathering tribes may have had easy time during the period.

It is not certain whether Aryans occupied Sindh, but their cultural and economic influence must have been tremendous. They also borrowed a great deal from remnants of Indus culture including the religion. Since they possessed bureaucratic machinery, very soon agriculture expanded in all the territories under their influence including Sindh, resulting in clearing of forests, grass lands, and pastures. This resulted in increase of population, which intensified the process of land reclamation for agriculture and further increase in population which finally made meat scarce and increased use of carbohydrates and vegetable proteins. The population of Sindh at the beginning of 7th century BC, must have been 500,000.

Around 600 BC requirement of animal flesh could not be met in most of the South Asia and meat eating was made a privilege of Brahmans and high caste Aryans. The resentment against this privilege, among the poor was challenged by Buddhism and Jainism both founded in 6th century BC outlawing caste distinctions, abllishing of hereditary priest-hood, and discouraging the use of meat. Budhists tolerated eating of animals flesh, provided eater himself did not participate in the killing, but Jains outlawed both killing and eating. This is probably one reason why Jainism failed to get ground in Sindh. Under Buddhism the butchers and fishermen became low cast killers, but rest of the community ate as much flesh as they could afford and if it was available in Sindh-Kohistan and Thar economy was pastoral and so was forest areas near the river. Hunting food gathering must have disappeared in the alluvial plains the exception being fishing, bird shooting and catching or trapping. In Kohistan and Thar pasturing may have coexisted with some hunting food gathering.

The meat shortage was to continue in most of the South-Asia, though not in Sindh, where pastures of Thar and Kohistan kept the supply of meat steady. After about 350 AD and definitely by 465 AD under Chandragupta II eating of beef was banned by an official decree, making killing of a cow a crime equivalent to killing of Brahman. This did not apply to Sindh which he did not control and where Buddhism flourished. The modern Hindu concept of protection of cow is out-come of a political symbol of Hindu resentment against beef eating Muslim invaders of 11th century and later, though in their daily treatment, bulls are still fed, given grain oil-cake, and even vegetable oil, whereas cows do scavenging of the village streets, and in the town markets.

By the time Alexander entered Sindh, hunting-food-gatherers must have disappeared from alluvial areas of Sindh and population may well have reached 1000,000 limit of which 80,000 were killed in wars with the invader. The total population of the South-Asia must have been between 50 to 100 million of which major portion must have been in Indus valley and Gangetic planes. This population figure levelled off, for Sindh, until about 10th century when carefully planned irrigation networks by increased the area under cultivation. The population may have reached about 1,250,000 to 1,500,000 by about 1508 AD, but subsequent termoil and state of civil war for next two centuries must have reduced the population to 800,000. Under Kalhoras

who were master canal builders area under cultivation rose to all time higher pre-Barrage figures 3000,000 acres and population around 1758 must have been about 3,000,000.

An interesting description of hunting food gathering communities of Manchar Lake comes to us from Mazahar Shah Jehani (1644 AD), which states that fishermen of the lake lived in water, fed on fish, ducks and swans, and lake products like Bih, ……., Moth, Lorah, ……..., Kuma, ……..., Pabann, ……. etc. They did not know how to walk on land and could not stand erect.

The source of animal protein was fresh and sea water fishes and meat, most probably from invertebrates of land as well as the sea.

Mammals:

Among the mammals the following are of note:

(i) Unicornis Rhinoceros, (The one honred rhino) now extinct but had survived upto 16th century as reported by Baber Badshah.

(ii) Asiatic wild ass or Goorkhar (equus bemionus) or Onager, which one time may have roamed Sindh but is not found on the southern areas of Thar Desert and Rann of Kutch. In the last century it existed in Tharparkar district as well as Kohistan. It must have been trapped rather than hunted as it can run at speeds of about 50-60 kilometres per hour for a few miles without showing any sign of exhaustion. Its meat could hardly be distinguished from beaf specially when barbecued or roasted in fire. Its average weight of approx. 240 kgs for male 200 kgs for female would have attracted the hunter.

(iii) Wild pig or Indian boar (sus scrofa). It must have dwelt in the Indus plains, Indus Delta and Hakra plains, where it is found to this day. Its concentration would be in the riverine forests. It must have been a special food for large carnivores, and man must have had competition with them for this food. It can quickly gain weight and a good diet and in the pre-Indus culture forests with plentiful food may have weighed between 160-200 kgs.

(iv) Pharha or Hig Deer (axis percinus). It still survives in the Indus riverine forests, Indus delta and Nara valley up-stream of Jamrao Regulator. It thrives on poplar (Populus euphratica), grass, fruit of ber (zizyphus) tree, and etc., and would have flourished in the Indus forests.

(v) Swamp deer or Wadisingo, or Chitto Pharho (cervus duvauceli). It became extinct at the end of the 19th the beginning of 20th century, when it was last reported around Rohri.

(vi) Blackbuck deer, (antilope carvicapra). It still exists in Nagar Parkar, Chachro, and Nara Talukas. It is resident of Semi deserts, and can tolerate very hot days in the sun-shine. It is a fast runner (65 kilometre per hour). It is preyed upon the wolves and large carnivora. Early man may have trapped it rather than hunted it down. Its weight varies between 30-40 kilograms under present scarcity of food in the desert. Among antilopes family (heleotra gidae), Sindh also had tebracerus quadricornis (four horned antilope).

(vii) Nirgai or Blue bull (boselaphus tragocamelus) is not a cow but an antelope found in Nagar Parkar and Chachro Talukas grazing on grass and browsing on trees like acacia arabica, prosopis spicigera and zizyphus jujaba (ber) and its fruit. Ity has a few natural enemies and must have provided exclusive food to the hunters. It must have existed in the whole Sindh during the hunting cultural times.

(viii) Common Indian Gazelle or Gazella or Ravine Deere. Today it has survived in whole Thar desert and Western Hills and lives on tufts of grass and browsing on zorophytic type bushes growing both in Thar desert and Kohistan and if these plants are green it would take water only occasionally. It can also stand- by amount of heat like a camel and dissipate the stored heat at night. It is fast runner and must have been caught by trapping it in the mountainous gullies etc.

(ix) Sindh ibex Sarrah or Persian wild goat or capra bircus or capra aegagrus. It exists in the hills of Dadu and Larkana district and can climb steep hills. They browse on leaves of salyadora oleoides acacia senegal, Zyzyphus nummutaria, which grows on steep hills. They can jump into water well or pit and jump out. Leopards which prey on the Sindh ibex are getting extinct. It must have been hunted by trapping it or with help of chasing dogs. Its weight may vary between 50-100 kgs, depending on sex age and feed.

(x) vrial sheep or Shapur sheep (Ovis Orinetalis) or Gad. It is found in hilly areas of Dadu and larkana district. They thrive on grass but can survive by browsing on acacia Senegal and acasio modesta. They move in separate herds of females and males. Females are accompanied with immature males and adult males. Since they are slow runners and practically defence less, they must have been caught by the hunters.

(xi) Indian Hare or Rabbit or Black Naped Ware (Lepus Nigricollis). It must have existed throughout Sindh and may have been hunted and other ocassionally, when big animal hunting may not have been possible.

(xii) Crested Porcupine (Hystrix India). It exists in whole of Sindh to this day. Because of its huge size (28 inches without tail) and weighing 30 kgs, this may be the only rodent that may have been eaten by the hunting tribes of Sindh (the other Sindh rodents are Fire striped

northern palm spring squirrel, sand coloured rat, house mouse, fawn coloured mouse, borwn spiny mouse, bush rat or golunda, Indian mole rat, short tailed mole rat, gerbil, Indian hairy footed gerbil, antole rat and Indian desert Jird, which are all too small to make their trapping for meat attractive. Even to this day the meat of porcupine is considered delicious by Bagri nomads of Sindh. Among the aquatic mammals (Geaces) or those living both on land and sea but suckling their young existing them and worth hunting were:-

(a) **Blue whale:** This must have existed along Sindh-Makran Coast then, but it is doubtful if hunting tribes could have had boats or crafts sufficiently big to capture it.

(b) **Indus dolphin:** or Su-Su. Found above Sukkur in the Indus, now getting rare. It is a fish eater amphibian and competer of man and therefore must have been hunted from the earliest times. Males weight 300 kgs and females 180 kgs and must have been good source of flesh. Its oil may have been used as lubricating agent.

(c) **Sperm whale or Kogia breviceps:** This whale weighs only 180 kgs and found near the mouth of Indus. It may have been captured and eaten by hunting tribes of Sindh.

(d) **Black finless porpoise or little Indian porpoise:** It is found in deltaic creeks of Sindh and may have been captured and eaten. It is about 4 feet long and weight about 30-40 kgs. Among the philidota or scaled animals, Indian Pangolin or Ssaly ant eater or Manis crassicandata is only animal found in Sindh. It is found in the whole of Thatta and Badin and Dadu and Larkana Districts, and Talukas of Diplo, Mithi, Sukkur and Kandhkot. It lives on termites and their eggs and is helpful to human being but today it is killed for various parts of body for medicines. It was most probably eaten by hunting tribes of Sindh. Sindh has large number of carnivora or mammals which feed on vertebrate prey, like wolves, foxes, jackals, cats, badgers, luttras, civets, mangooses, Hyaenas, panthers and etc., and there may have been may more species in the past, but it is doubtful if man eat many of them, primarily because they are slim, fast runners, difficult to catch and as compared to the risk and trouble to catch them the meat output from them is not rewarding enough. The hunting tribes may have occasionally trapped and killed them as his competitors and eaten them too. These will include:-

- Indian wolf or Canis Lupas Pallipes. Today it absent in irrigated tracts of the three barrages, though occasionally occurs in the whole Thatta district. It exists in the whole Thar and Kohistan. Seventy years

back it existed in almost the whole Sindh. British launched a campaign 1897-1907 to kill wolves in Sindh. The world-wide belief that it attacks human-being is now considered a myth. Since it lives on goats, sheep, rabits, wild sheep, wild goats, deer, ibex and ocassionally on rodents and birds it may have been trapped and killed to save meat animals for man. In such a case it may ocassionally have been eaten, though its weight of about 25 kgs, would discourage.

- **Asiatic Jackal or Canis Aurcus.** It is found throughout Sindh except 20 mile wide strip along the Indian Border to the east. It is a village scavenger and eats vegetables, edible refuse in the villages, fruit, jurds, mangoose, rodents, lizards, snakes, frogs, insects, birds and hedge-hogs. They visit village at night and are caught in special traps called 'Korki'. It is eaten or by a nomadic tribe of Bagris. Since it is scavenger and regular visitor to human habitation, the hunting tribes may also have easily trapped it and eaten, inspite of its low weight of 7-9 kgs.
- **Fox Indian Fox or Vulpes Vulpes bengalensis.** It is found throughout Sindh, lives on ripe fruit of banyan trees, berries of Neem plant, melons, insects, lizards, frogs, birds, hares, rodents, termites and crops like peas etc. It weigh only 3.4 - 4 kgs and would not be attractive to kill for food, but its fur mattresses may have attracted its capturing in Korkis.
- **Bengal fox or Vulpes bengalensis.** It is found in Mahal Kohistan Taluka, Thatta, Hyderabad districts, and irrigated as well as forest areas of Nawabshah and Khairpur districts, otherwise its weight and food habits are like Indian fox.
- Black bear (Mumm) or Selenarctos thibetanus or Asiatic bear. It is now extinct in Sindh but is found in Kharan, Kalat and Bolan hills. It existed in Kohistan hillsd, as per local tradition. It may have existed in hunting cultural times. It was smaller in size than the brown bear of Pakistan.

Tiger or Tigris regalis.

It is most probably extinct today but was found in Khairpur state in the last century. It lived on all kind of animals like horses, donkeys, cows, buffaloes, deers, goats, sheep and would even take away human being from village.

Luckily for man it is a cannibal and devours his own young and tears his mate to pieces, if she tries to defend the young. This must have kept their population low. It is doubtful if man over preyed upon it for food.

Leopards parlus or Panther.

Occasionally found in the hills of Karachi and Dadu districts. In the last century it would enter the jowar