International Academy of Science,
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IASET

INDIGENOUS KNOWLEDGE ABOUT PREDICTION IN CLIMATE CHANGE

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ABSTRACT

In this paper author provides Indigenous knowledge, traditional stories and prediction relating to lightning, wind direction, cloud formation, rains, drought, birds, animal, trees, mitigation, response, and effects of climate on crops are realistic in a contemporary environment through the tribal peoples of Tharparkar, Sindh, Pakistan. This research is related to tribal communities and individual (includingvMaheshwari, Sutahr, Brahmn, Luhana, Rajpoot (Thakur) Maharaj, GuriroBheel, Menghwar, Kolhi. Bajeer) observe and manage naturalruins and dangerous weather events, with their stratagems for initialdiscovery of upcoming events and for coping through theseevents, as well as their observations of their short and long period impacts on culture. The research was conducted through the qualitative research methodology. Indigenous knowledge has remained the focus of anthropological study since many periods. It looks at the traditional ways of understanding about the nature, environmental conditions and effective use of resources. People acquire this knowledge to cope with natural stresses and solve their problems. This knowledge generates from native perspective. Value of indigenous knowledge is becoming recognized by scientists, managers, and policy makers. The various statements and perceptions of the aged people and young people (young those who believe in scientific knowledge) claim that the scientific knowledge is more authentic and powerful than indigenous knowledge where the indigenous peoples say that the scientific knowledge is harm (impure or unsacred) according to religion! How the indigenous people transfer that knowledge of prediction from one generation to another generation or raged indigenous knowledge only to the selected ones will tried to collect the comparative data of both scientific knowledge and indigenous knowledge.

KEYWORDS: Indigenous knowledge, Predication, Climate Change, Conservation, Famine, Forest Resources, Rains, Drought Tharparkar, Sindh, Pakistan

INTRODUCTION

This is an ethnographic study of indigenous community focused on indigenous knowledge in environment prediction practices, especially rain and drought conditions. This research comes under the domain of Environmental Anthropology. It investigates how indigenous knowledge helps indigenous people in forecasting the weather conditions, prediction about rain, disaster and farming the effective work to overcome the danger events. Indigenous knowledge is the traditional knowledge based upon the various cultural traits it is adopted by the local peoples for predicting the particular environmental changes. It is the local knowledge which plays vital role in the structure of weather spirit. Indigenous knowledge broadly nourishes the remote or the indigenous communities living in particular environment to predict the situations. This type of knowledge is limited in the particular areas, where they predict from various environmental factors. It is more important knowledge for the peasant communities' instead of scientific knowledge. This knowledge is

transformed from generation to generation. These communities are exceptional in their living nature by having this type of knowledge. These peoples are also not aware about scientific knowledge to forecast environmental changes. This knowledge is strongly based on certain principles of cultural laws, legendary stories, prediction stamina, and folklores and so on. The study of these peoples also focuses the factors affecting them to develop in merging their knowledge with scientific knowledge. The intact of prediction is also of great response that how they predict the coming events from environment by appearance of natural consequences."Indigenous knowledge research originally emphasized indigenous technical knowledge of the environment, but it is now accepted that the concept of Indigenous knowledge goes beyond this narrow interpretation. Indigenous knowledge is now considered to be cultural knowledge in its broadest sense, including all of the social, political, economic and spiritual aspects of a local way of life, Indigenous knowledge is embedded in a dynamic system in which spirituality, kinship, local politics and other factors are tied together and influence one another. Spiritual beliefs about nature may influence how resources are managed and how willing people are to adopt new resource management strategies. (Morris, 2005 p 353 A. M. Manyatsi. 2011). "Indigenous knowledge (IK) is the local knowledge – knowledge that is unique to a given culture or society. IK contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management, and a host of other activities in rural communities" (Warren. 1991 p, 02)."Indigenous Knowledge is the information base for a society, which facilitates communication and decision-making, Indigenous information systems are dynamic, and are continually influenced by internal creativity and experimentation as well as by contact with external systems"(Flavier, et al.1995, p, 479). "Indigenous Knowledge refers to the knowledge, innovations, and practices of indigenous Groups in matters related to agriculture and environmental management, Medicine and health, art and language, Traditional cultural expressions (TCEs) Are also parts of Indigenous Knowledge. Like IK, TCEs have been passed from one generation to the Next (orally or by tradition) and are an integral part of a culture's identity and heritage. These expressions include, but are not limited to: music and song, Stories, symbols, dance, rituals, architecture, arts, and crafts" (Franklin, 2008, p, 03). Indigenous knowledge systems are a body of knowledge, or bodies of knowledge of the indigenous people of particular geographical areas that they have survived on for a very long time. The defines IKS as local knowledge that is unique to a given culture or society. They are knowledge forms that have failed to die despite the racial and colonial onslaught that they have suffered at the hands of Western imperialism and arrogance. IKS are forms of knowledge that have originated locally and naturally" (Altieri 1995, 114.). The environmental indicators used by the farmers to predict seasonal rainfall included timing, intensity and duration of could temperatures during the early part of the dry season. Farmers believed that intense cold during this time corresponded to abundant rainfall during the rainy season, and that if this cold period began early or ended late, the rains would do otherwise"(Roncoli et al., 2001. A. M. Manyatsi. 2011). The knowledge set is influenced by the previous generations' observations and experiment and provides an inherent connection to one's surroundings and environment. Therefore indigenous knowledge is transferable and provides relationships that connect people directly to the environments and the changes that occur within it, including climate change" (Karjalainen T, Kellomsˇki S, Pussinen1994; 28(2)). In matters relating to security, especially of properties like homes and livestock, the indigenous people developed some mechanisms that are still used in some rural areas to monitor their Properties. They have also developed traditional ways of weather forecasting that helped them to plan their activities for at least two to three days in advance. This knowledge was very useful especially in summer and immediately after harvesting when crops like finger millet would be in need of thrashing and winnowing. (Gyampoh, B.A., M. Idinoba, J. Nkem, and S.

Amisah. (2007)). Local resource users' observations and practices (often termed traditional ecological knowledge—TEK) have increasingly been recognised as a valuable source of information regarding natural processes and their dynamics (Sillitoe, 1998; Berkes, 1999). Part of this knowledge pertains to observations and interpretations of weather phenomena and climatic trends. Some studies (see for example Sollod, 1990; Ovuka and Lindqvist, 2000; West and Va´squez-Leo´ n, 2003; West et al., 2008).Have shown a remarkable overlap between these observations and instrumental climatological records. Others went beyond the simple comparison of the two knowledge systems (TEK and formal science) and showed how the inclusion of local observations in analyses of climate change can improve the confidence of climate change analyses (Huntington et al., 2004; Nichols et al., 2004; Orlove et al., 2002; Riedlinger and Berkes, 2001).These studies show that local resource users observe climatic changes and their biophysical impacts at smaller spatial scales and in greater detail, and can thus provide further evidence for or against general models and predictions, made at coarser scales. By having to account for two sets of observations, from different spatial and temporal scales, this integrative approach can also lead to more robust predictions of mechanisms of change (Huntington et al., 2004).There is also an apparent lack of a credible communication procedure of the forecasts to peasant farmers. The scientific and technical nature of such forecasts further complicates their utility among peasant farmers. Adejuwon et al. (2007) also highlighted on the low correlation between the predictands used in the forecast and key factors for crop performance and yield. The accuracy of the forecasts has also been found insufficient, which is presently at 75% according to Chang'a et al. (2010). In view of these constraints in scientific weather and climate forecasting, indigenous knowledge (IK) is recently being advocated to complement modern scientific knowledge. Collectively, this knowledge represents a dynamic information base that has supported most rural communities by adapting to constantly changing and varying climates (Nyong et al., 2007).Traditionally, African farmers have used indigenous knowledge to understand weather and climate patterns and make decisions about crop and irrigation cycles. Chang'a et al. (2010) detailed on the application of IK in rainfall prediction in the south western highlands of Tanzania. That study also highlighted on the beneficial utilisation of IK within southern and eastern Africa. Much as there is no standard definition of IK, IPCC (2007) and Ajibade (2003) used the term to describe the knowledge systems developed by a community as opposed to the scientific knowledge that is generally referred to as 'modern' knowledge. Johnson (1992) defines IK as a body of knowledge built up by a group of people through generations of living in close contact with nature. According to Johnson (1992), this knowledge includes a system of classification, a set of empirical observations about the local environment, and a system of self-management that governs resource use. This involves an ability to analyse situations and interpret the results; practical experience of tackling problems and perspective of having an overview of a subject or issue. In climate and weather prediction, IK has proved to be more accurate and reliable at local level (Ziervogel, 2001; Nyong et al.,2007).IK has therefore provided the basis for local-level decision making in many rural communities (IPCC, 2007).

Significance of Study

These people also give importance physically and psychologically to fulfill their needs by environmental and natural factors. Through these practices these people are quite experienced in prediction. The Indigenous people are simply living and are not connected to the modern world due to lack of education. These people are also highly representative of culture and they prefer their cultural heritage. The indigenous people do not follow the scientific knowledge because still scientific knowledge has not nourished in the indigenous culture. They mostly believe in indigenous knowledge because their predictions accurately work according to then. Scientific knowledge is only limited to their young ones who are somewhat literate. Their culture is also somewhat isolated because they are not connected to the media or modern

technology their daily routine is quite buys by doing various works also.

Hypothesis

The traditional or indigenous knowledge nourishes mostly in the remote areas and it is transformed from generation to generation. It is important for to the natives instead scientific knowledge still they have not inherited scientific knowledge because they only believe the knowledge which they acquire from their forefather I the only believe what they predict and perceive from the environment by prediction still scientific knowledge has not been introduced in then because they are not more literate, and away from the world of modernization and globalization

Research Methodology

As we know that anthropology is a science of qualitative and quantitative techniques for gathering reliable data. If any anthropologist wants to do field work in any community, first he should try to build his Rapport with Community people and the natives of Tharparkar district which was a challenge to fascinate the people for observation and field work. The first started a review of various published, articles and unpublished literature sources relating to Indigenous knowledge of weather predication events and major climatic change, consulting traditional religious, traditional rituals textbooks in local languages and English, and research papers and other written materials. Versions and coping strategies followed by ethnic peoples from across the state were documented, along with oral history and ethnographic reports. The study was carried out in the rural villages of Tharparkar where a desk study including a review of the relevant literature available on indigenous knowledge was undertaken in preparation for the collection of data in the field. Although different methods of data collection were used in the different areas, interactive discussions, open interviews, Participation Observation, Key informant interviews, In-depth interview, Informal Discussion, Formal Interviews, Structural Interviews, Sampling, Photography, Daily Dairy, focus group discussions, meetings, cultural mappings and intensive interviews were used. In particular meetings were deemed important for informing and building community trust with the research. Cultural mapping was seen as important because it involved making use of local experts which made respondents feel that they were sharing information with fellow informants. According to "It is often to employ more than one measure or mode of observation in the study of particular cultural institution. This is the way of multiple instruments research. "(Pelto and Pelto 1978: 193) Methodologies refer to the structures of producers where the ethnography shift information up and down this ladder of abstraction in order to produce and organized increased knowledge. Methodology denotes the logic in use involved in selecting particular observation techniques assessing their yield of data and relating these data to theoretical propositions. Methodology can be distinguished from research techniques in that the latter term is useful for referring to the pragmatics primary data collection. So I will manipulate some methods for proceeding the research or thesis which are given below.

Indigenous Community Trust

The scientific importance of such evidence was also discovered though gathering indigenous knowledge information matters such as whether they were survival accepted and reliable by local communities and individual respondents and the kind of common language, native language and knowledge used in the communications. The area selected was identified on the basis of their, Desert rural, diverse environmental, socio-cultural and economic backgrounds. The strategy for collecting evidenceinvolved the use of various approaches such as interactive interviews, focused group discussions systematic observations and documents from oral history, reports, research publications, mass media, articles

and magazines. A survey was developed to guide consultations with key informants on natural resources conservation and disaster running. In each location the focused group discussions (FGD)were conducted with three discussant groups defined by age as follows: 30-40, 45-60 and above 60 years. In some sessions discussions formanaged women were separated. The focused group discussions were documented and the information analyzed and entered into a record. Data was also collected from local informants and respondents between the various ethnic communities of Tharparkar. The position and availability of the data various from one place to alternative but efforts were made to progress a common indigenous knowledge terminology used in ecologicalre sources management, predication and natural disaster controlling. In particular achallenge was made to document the relationships between application and use of indigenous knowledge and the various cultural and spiritual values which pervadeseveral of the communities in the study. Tape recorders remained used to confirm the reliability of the interviews. Further most of the people we interviewed in this study appreciated traditional knowledge in relative to early cautionary and coping mechanisms for expected disasters. Only a few self-confident young folks who were familiarized to the use of transport vehicles said that they rely mostly on radio weather predictions rather than on local methods of antedating weather proceedings.

MAJOR ETHNIC GROUP

Muslims and Hinds

MUSLIM: 59% the main tribes among Muslims are Syed, *Nohri, Rahiman, Sameja, Soomra, Halepota, Juneja, Lanja, Sama, Khaskeli, Memon, Bajeer, Rind, Khosa, Theba, Dall, Raja, Mehar, and Chandia&Kumbhar.*

NON-MUSLIM: *41% the main choice among Hindus Brahmn, Luhana, Maheshwari, Sutahr, Rajpoot* (Thakur) *Maharaj, GuriroBheel, Menghwar, Kolhi. Bajeer* is common cast in Muslims and *Hindues.* ii. The Schedule cast includes *Menghwar, Bheel* and *Kolhi*.

1. *Bajeer* 2 Syed, 3. *Nohri*4. *Rahiman*5. *Sameja* 6. *Soomra* 7. And Hindu cast in village 8. *Bheel* 9. *Menghwar* 10. *Kolhi*. There is no concept of hierarchy among these sub-castes. They all equal status and social position. All the people of the cast belong to the peasantry so they belong to lower class because they have not any other resource to make their *livihood*trustful.

Survey Results

The study found that indigenous knowledge methodstakepermitted the several communities in the area to live in harmony with their environments for groups, native groups, and that their traditional knowledge systems are vital tools in environmental management and prediction Based on this traditional knowledge and peoples long-lasting experiences concerning indicators for Stars, cloud formation, lightning wind direction, rains, drought, Birds, Animal, Trees, Famine occurrence of rains in a particular period of the lunar calendar and dates, the Indigenous rain forecasters predict the reasonably particular nature of rainfall for the perfect season, including good and undesired possessions (e.g., flooding, famines). There are well notorious Sutras given in the ancient books to predict the monsoon and update people about forecasts of agriculture in a given year. Even in villages it is very common for farmers to consult Brahmans about the rainy season in a year. Monsoon predictions are also made according to the nature, color, and direction of movement of clouds, stars, rains, drought, Birds, Animal, Trees and lightning in the clouds. In the prediction that a specific year is probable to be a drought year, the nature of clouds is defined as follows: "There would neither be affluence nor rain in the land must the clouds be rough and small, tossed about by the wind have the shape of camels, corms, dead bodies, other discouraging creatures, and be quiet" The tribal peoples of Tharparkar face many natural dangers, but the major ones

are drought and floods; these always cause famine, food diffidence and poverty. However, the people take developed a variability of measures to struggle with these conditions, such as increasing drought-resistant and early-maturing indigenous crop variations, gathering a variety of wild fruits and vegetables, wetlands agriculture, livestock diversifying and terrible that takepermitted them to survive climatic hazards autonomously, with little or no funding from the outside world. The people are well aware of the disasters they face and in most suitcases had the knowledge and directorial structures, or social organizations to cope with them. Some of the predictions in climate by indigenous knowledge are mentioned as:

Prediction

These people forecast weather through indigenous knowledge which they have developed from their practical experience at Tharparkar. If there is any uncertainty of weather prediction. Then these indigenous people rely on certain signs and object which indicate about weather forecasting. A Prediction is a statement about the way things will happen in the future, often but not always, based on experience or knowledge. Here we must note down that there is much overlap between a prediction and forecast. A prediction is a sort of statement according to which some specific outcome is expected, while a forecast may cover a range of possible outcomes. Predictions are made on the basis of various things, like the direction of wind, direction of clouds, the movement of stars, size and shape of the sun, moon, behavior of animals, seasonal activities of birds and seasonal variation in the condition of plants. Predictions are very important for people especially those who live in communities as they often perform their rituals according to the predictions made. The people of Tharparkar also make predictions on the basis of the movement of heavenly bodies like the sun, moon and stars. There are also other indicators like thunderstorm, movement of clouds, behavior of animals, activities of birds and direction of wind on which basis they make predictions. Indigenous people have lots of belief on these indictors. There is specific time period for prediction and appearance of these indictors. The people of a community wait for predictions to be made by the elders and experienced men of the community. If it is required to make a second prediction then the indigenous people look for other indicators of prediction. According to Ron coli: "The environmental indicators used by the farmers to predict seasonal rainfall included timing, intensity and duration of cold temperatures during the early part of the dry season. Farmers believe that intense cold during this time corresponds to abundant rainfall during the rainy season and that if this cold period began early or ended late, the rains would do otherwise"(Ron coli et al., 2001 p 5)

Time of Prediction

During the predictions are made whole year. There are four months in which predictions about rainfall are made, experienced person of Tharparkar. Who have in indigenous knowledge start predicted? There are the names of these four months, Jun, July, August, September, and + October. And native months. *JaitAkhaar, Sawan, Bhadon*, and + *Assu.* Prediction about rainfall are made in thar according to some living and nonliving things such as wind, cloud, moon, sun, star, birds, animals, and plants etc. the people of their community aspect the prediction which are made there. Predictions also depend open the behavior and vices of the birds, including the behavior of animals. They start to cultivate their fields when the months of *Akhaar* star. The rainfall from four sides rains from 15th in the month of *Jait* then it will be very *benifashad* for those people if it is not so, then they make other prediction which will be for month of *Akhaar*on the 2nd of month *Akhaar* they seen moon. While watching at moon, they see clouds there in the sky and predict about rainfall. I say that if it happens like this them and if there is rainfall from any side so what if it is for from then they become happy and they announce that there will be rainfall. The way of their announcement is in the poetical like.The porter which is given

on the second number it means that they are proper them self for cultivation and plighting. After the prediction of rainfall they inform ever person of their community to be reedy and prepared for the heavy drought. If there is not (lighten) from the any side of the sky then they predict about drought.

Prediction on the Basis of Lightening in the Sky

"In Tharparkar district anomalously warming during the months of August to November is an indicator of high rainfall in the upcoming season. In both Rung we and Kilolo, it was indicated that an occurrence of strong wind is a signal of poor rainfall season to come."The Lightening is also an important indicator in making a prediction of weather. As they are Lightening also appeared in different months but the prediction of rainfall is only done in the months of June, *(Akhaar)* bear a big important of cause of rainfall said by the people of Thar. It is said that if there is lightening in the sky on the second day of the month of *Akhaar;* it is a mark or indication of rainfall. The elders and experienced people of the community make a deliberate effort to look for this indicator on the second day of the month of *Akhaar.* The people of the community have strong belief that it is just going to happen as predicted by the elders of the community.

Prediction on the Basis of Clouds' Movement

Clouds' movement is also an important factor of prediction about rainfall. As the rainfall is very important factor for the people around the Thar. They say that rain clouds are the big support of rainfall. As the clouds are also appeared in different months but the prediction of rainfall is only done in the months of June, July, August, September and October but from these months the June and July bear a big important of cause of rainfall said by the people of Thar. The prediction of heavy rainfall is made by the people of village Mehari Bajer, when they judge clouds coming from the west. But the prediction will be different, if clouds are rising from three sides. The third prediction of cloud is that when the sun is setting down and clouds cover it, they predict rainfall within three days. In this case, they understand that it is time to cultivate their fields.This prediction is done from their forefathers and it is in the Mythology of these people. Most of the people predict about the rainfall when the clouds appear before of the Umerkot, *Nagarparkar*and *Chhachhro,* they say that this is good for heavy rainfall. They also predict that if the clouds appear before the Mithi and *Deplo*, then the rainfall is not good.

Prediction on the Basis of the Moon

The moon is also an important indicator in making a prediction. The prediction is made according to the shape, size or color of the moon. These predictions are made monthly by watching the size and shape of the moon at the beginning of the Islamic months. Often such predictions are made in the months of Ramadan, Shawl and Zulquaid. The most recent case of a prediction was heard during these three months. Having watched the moon, the elders and experienced people predicted drought in near future. The people of Tharparkar give another prediction about the rainfall when they watch the risen of the sun and moon at the same duration. If it happens then they declare that there will be rainfall. But it is not a usual happening, it happens only once in a year. It is also said that if the new moon is clear and there are no clouds, then it is also an indicator of rainfall. Another saying for this is that if there is carrel rod on the moon, it has God. If there are four stars in or around it then it is also indicator of heavy rainfall. But if there is only one star in chervil then there will be little bit rain. This prediction of moon is mostly made by the Muslim community. In rare cases it happens that the moon does not appear completely. If it happens then the rainfall will be done and that is the main source of producing the crops by farming and cultivation of the lands and that is only the source for these people. Recently this

prediction yields heavy rain falls in almost ten to fifteen days. The most experienced and aged people gathered at their community and observe this indication of moon. The following picture which has been given above was captured in these three months. In this picture the prediction of drought has been made by watching size and shape of the moon, if you will see this picture you will find at different the other months.

Prediction of Stars

The stars are also serious indicators for making prediction for the people of Tharparkar. This star is also important for the other countries of Asia and Africa, Zimbabwe, Tanzania, and India. Because of prediction of the monsoon season. They say that if there is a star in the sky and it appears after the sun set during the months of Sawan, and Akhaar, then there will be heavy rainfall. In these months a star named by the native as "Sanjhi", is appeared then it is predicted that the heavy rain will be fallen otherwise not. Apart from that it is also an indicator of bad time. There is another star named by the native as Khatar star which appears after every 40, 50 years. They say that when it appears in the sky we feel that it is very near to the earth, and it appears very clear and unique. They say that when this star appears, they predict that the coming time will be of the prosperity, and that in future time will be good for their cultivation of the fields.

Prediction of Sun

For the people of the Thar the Sun is also the main source of the prediction of the rainfall. This prediction is done during the months of June, July, August and September. Mostly the probability of the prediction of the rainfall is high in the months of June and July. This can be done in any of the day in these months.

According to the key informant Abdul Yaqoob 70 years old says that recently he has seen that there were the lines appear in front of sun which they called (MOGH) so he along with his villagers predicts that there will be rainfall. It is more accurately predicted the rainfall when these lines appear during the sunset. After the prediction there will be heavily rainfall within 5 to 10 days.

The line which appears on the sun looks like rainbow. These lines are cut in the middle and the color of these lines is yellow and blue. This process of the line on the sun is also called (Bandi). If Bandi is seen on the sun they predict rainfall with certainty. There can also be seen the darkness on the sun it is also the mark of rainfall. The sun is sometime covered with clouds and sometime it is very clear. These lines appear either at the sunrise or at the time of sun set. The other prediction about the sun is that when there is a Crile around the sun, it is also a sign of rainfall.

Prediction of Jacobin cuckoo (Taro) Bird

Through these birds the named (Tarro) indigenous people predict about the weather. These birds come from various countries like Asia and Africa, Zimbabwe, Tanzania, and India. They sing during the months of June (Akhaar) this is the bird which is also quoted by Shah Abdul LatfBhitai in his poetry. As his name is mentioned in (Sour Sarong). According to sindh mythology it has a beak atop its head and it thirsts for the rains. Tharparkar's people said that, Tarro bird is lover of rain. This bird is knows for the coming of rain. This bird has a hole in his neck. It drinks water once a year and it drinks only the drops of rain. When there is rainfall this bird has its neck up in the air and the drops of rain enter directly in the hole that is in the neck. Due to the hole in the neck, this bird is not able to drink other water which is present on earth. As the months in which the rainfalls this bird start to sings. By hearing it's singing the people of Thar understand that now this the time when the rainfall. This bird sings to welcome these month because he is very thirsty. This bird only appears and sings when it feels the rain. The especially of this bird is that if it does not drinks water then it will have to wait for the whole years till the same period of rain comes. It may happen every year, and it does not need the water the whole year. This bird has to drink water during the rain direction which is to and half days otherwise it will remain thirsty for the whole year. When this bird sings the people of Thar understand that within 15 to 20 days there will be the rainfall. This bird sings after 10 are 11 pm. If this bird sings from mid night to early morning, this is signs of the heavy rainfall. The people of Thar predict according to the behavior of this bird. The predict say that if this bird sings from sun set to early morning them the rain will fall within one day. Tarro bird sings only to prose has owner and prayer for the rain. This bird does not sings but in the period of rain so the people Thar rely on the sings of this bird to predict. It belief of people that when he signing starts and then that time rainfall, then people of thar start to save the rain water, during the three days of binging of Akhaar . This is used for the local medication of people. It also predicted in concern areas of Tharparkar 90% people belief on the prediction of this bird. These people predict through birds because they have no any technology to know the time of rain fall in those areas, and they belief on this because it has been continue for their forefathers.

Prediction of Marbled Teal (Malari) Bird

Through these birds the named Marbled Teal (Malari) indigenous people predict about the weather. The aged persons predict according to this bird. This bird is also important for the other countries of Asia and Africa, Zimbabwe, Tanzania, and India. Because of prediction of the monsoon season. They is many kinds of birds in Tharparkar but this bird is more important for these people because it is the biggest source of prediction for monsoon season in Tharparkar, especially Menghwar community has full faith on this bird because agriculture is one of the main source to survive to their lives. According to key informant named (Bhojo Mal ages 65 years) says that this bird give us full information of monsoon season we are predict in the morning when we go to field and also when we come back in evening because we can easily see movement and behavior of this bird in this time. We can also predict regarding the production of the year this bird is my examined and I have full faith on it. They also make their discussions and live their same ways of life with the help of this bird. When the people of Thar start to plough their field at that time they watch the behavior and voice of this bird. The people of Thar start to predict from morning to evening. During the monsoon this bird sings and the people of Thar understand that here comes the rain. It is also included in belief of people of Tharparkar that if this bird sits on the left side of the people then it is signee that the crop will be very beneficial, but if the some bird sits on the right side them it will be very harmful for then. When the people of Thar go to their fields at the first time they pray for the coming of Malari bird because this is the sign of rain. When the people of Thar go to their fields in the morning then if this bird comes from the right side of the farmers then it is s sign of good day after reaching at the field if the some bird comes from the left side it is also the sign on good day but if the some bird comes from the right side of the farmer while retiring to their homes then it

is sign of bad time. This bird sings from morning to 12:00 pm and in the evening from 4:00 pm to sunset.

Prediction of Peacock (Moor) Bird

Peacock is a bird which also used for prediction in Tharparkar through its voice singing and its movements this bird signs in the morning same as other birds they predict on this bird this prediction is done during the months of June, July, August and September. Mostly the probability of the prediction of the rainfall is high in the months of June in the time of starting of day. This can be done in any of the day in these months but according to Tharparkar's people includes Nohri, Kolhi, Takur, and especial Menghwar community this bird changes its voice in the month of June then we understand that rain is about to come, and we start the Peacock is found in abundance in the Thar. This bird is found in houses and fields. The people of Thar say that Thar is known by this bird. Every person from child to aged once like this bird, so they feed it.

Prediction of Pigeon (Titar) Bird

Pigeon (Titar) is also small source of prediction. Like other indictors which are taken as signs for predictions. This bird is also beauty of Sindh and especially of thar. Normal weight of this bird is 0.25 kg, and has different colors many people catch and use it as food. It used for predict mostly in Asian countries. The people of Thar relate some myths and hopes with this bird. When the people of Thar see that all the birds are not singing then they take help for this bird. Mostly they predict in the month of august. If the pigeon sings from morning to evening then the people of Thar understand that the rain will fall after 8 to 15 days and then they start preparation for cultivation of the field before rain fall and this bird is also examined of these peoples, and birds are major source of prediction for the people of these concerned areas they also observed regarding their production of the years without taking help form any scientific or technological source 60% respondent people of thar take help for this bird for the prediction of this bird.

Prediction of Crow Bird

There is one more bird source of prediction about weather named Crow. Crow is used for prediction mostly in the Asian countries especially in Pakistan and Indian. People of Tharparkar consider it as a messenger of rain; this prediction is done during the months of June, July, August and September. The most elder person observes especially in month of June and July. First they predict in their house and second they predict on their fields. According to indigenous people we came to field and wait for coming of crow and give indictors of rain. They indicate through the behavior, movement, voice and fly, the prediction timing on crow is 12am to 6pm. Crow is the examined bird of Tharparkar people for prediction. The people of Thar predict by watching behavior of the crow. But if the crow comes to the home and crow very much and this is sign of guest and death. When the monsoon starts the people of Thar go to their fields and after reaching at the field they watch the crow sitting in the field. They feed ham the pieces of bread. If the crow is sitting in the field and eating the meal their then its sign of prosperity and the good crow but instead of this if the crow tic the crow meal flies an away them it a sign of drought. The crow usually sit on the roofs of the houses, if it hits something with its beak, its sign that he is hungry but if he takes slowly then it is sign rain. In the month of (*Sawan*) the crow lays the eggs. The people of Thar go and watch its eggs. They will predict according to number of eggs of the crow for example: if there are two eggs them they predict that there will be the rainfall for two times. On the absence of eggs, they predict drought.

Prediction of (Koonjh) Bird

Koonjh is a bird it is also used for prediction of rainfall in Tharparkar. It is a big source to obverse about rain fall

in Tharparkar. This prediction is done during the months of June, July, August and September. Especially in after 15th June when this bird comes on field people of Tharparkar predict on its behavior, movement and voice. Menghwar community is indigenous people in the prediction on this bird. In the season of rainfall if this bird is seen in the sky flying in a row in the shape of triangle it is also the sign of rainfall. As the people of Tharparkar are mainly dependent upon the rainfall due to which they do these predictions so that they survive their lives

Prediction of Owl (Gugh) Bird

Owl is a famous bird in Tharparkar it is also small source of prediction about rain. According to key informant MolaBuxsoomro ages 70 years, he said that I'm also satisfy form this bird, I hear from my ancestors that if this bird sings on any village it will destroy so whenever this birds increased in any village then people shift from that village. Owl is also one of the birds which are mostly found in Thar. The people of Thar also prefer this bird and make decision according to this bird. When the aged persons of Thar go for some work, they look for the owl. When they see that the owl is coming from their left side then it sign of good day but it will be opposite of it if it comes from right side. The owl gets out from nest in the night. The people of Thar decided their work according to their bird. Owl is hidden in the trees and bushes all the day. This bird is also understood as the harm for the people.

Figure 1

Prediction of Cow Animal

The cow is valued very much in Thar. Some communities worship the cow in the Thar. Those people care for this more than from their family. There are different kinds of cows. Cow is also used for prediction. Because of the worship of cow these people (Hindu community) nor sell it neither has it. When the cow sits, if it has got three legs under itself and one leg out it means that the cow is calling for the rain. While walking if the cow squirts and go for from the place of the squirting and if the cow returns to smells the squirt then it sign of rain. It is also understood the sign of rain when the cow sits on the sand. If the cows lick each it is the sign of drought. This prediction is done in the months of June, July, August, September and October. But it is mostly done in June native month (Sawan) .In this month the shoulder of cow turns to black by the clay and it is the first indication of the prediction of the rainfall and after 10 or 15 days the rainfall is done. whereas in this month if cows tastes each other then it is predicted that now this will be the month of famine and there is no any aspect of rainfall. This prediction is in the Mythology of the indigenous people so also consider as the source of prediction of rainfall and that is the main source of their living.

Prediction of Goat Animal

The Goat is also considered as the main source of prediction of weather by the indigenous people of the Tharparkar district. This prediction is done in the months of June, July and August. In any of these months these goats give the indications in the times like evening, after sunset, early in the morning. There is big number of goats in Thar. The people of Thar have 20-50 goats in every house. She gives the indication mostly in the month of Sawan. In the month of (Sawan) the indigenous people predict that if the goats sit in their within and they go in another within in night time in the east side one or two kilometers and they sit heir so we predict that there will be rainfall after one or two weeks and it is in their belief. And if this indication is done so they become so happy because that is the main source of rainfall and the famine will not be happened and they will survive happily.

Prediction of Chameleon Animal

This prediction is done during the months of June, July, August and September. Especially in after 10th June when this animal comes on field people of Tharparkar predict on its behavior, movement. This is reptile which has the ability to change its colors. It is not mostly used for predictions. Sometimes it climbs in the tree and shakes its head. By this sign people understand that the rain will fall. There is another type of Chameleon which lives inside the earth and also used to predict the rainfall. It comes out of the earth and stay there when it feels that there is the indication for the rainfall so it goes inside the earth and covers its well. So the indigenous people observe there is the chance of rainfall.

Prediction of Sheep Animal

This prediction is done in the months of June, July and August. In any of these months these Sheep's give the indications in the times like morning to evening, after sunset, early in the morning. Sheep is also mostly tended in Thar. The people of Thar use the wool of sheep to make the warm clothes, and they use its skin for the disease. When the month of Sawan comes, the sheep sits whole the day till the evening. It is the sign of rainfall in Sawan. In the month of Sawan the indigenous people predict that if the goats sit in their within and they go in another within in night time in the east side one or two kilometers and they sit heir so we predict that there will be rainfall after one or two weeks and it is in their belief. These indigenous people of Tharparkar district. And this is mostly predicted by the both Hindu and Muslim communities.

Figure 2

Prediction of Prosopi (Kandi) Tree

Kandi tree is the source of the prediction of the rainfall. This prediction is done in the month of July. It is also done in the courtiers like India, Zimbabwe and Pakistan it is done in the Thar by 70% of the indigenous people. This gives indication before the rainfall. This prediction is done by the indigenous people of thar from their forefathers and is the source prediction of rainfall so they can get the fruit from it and survive their lives happily. When this tree grows according to its season and has huge amount of fruits native word ''singrion'' Then indigenous people predict that there will be rainfall, and good time will come. If that Kandi tree will not grow according to has seasonal and not has amount of this kind of fruit Then the people of thar predict that this year there will not be rainfall, and people will suffer allot.

Prediction of Tooth Brush (Khaber) Tree

Khaber tree is the source of the prediction of the weather. In the Thar it is grown naturally and lives for 160 years. And the people of the Thar put a solid belief on its prediction. When this tree doesn't have good amount of fruit, (Pearon) then the people of thar predict that there will be not rainfall. When this tree have good amount of fruit (Pearon) then the people of thar predict that there will be rainfall, and the whole year will be good for the people of thar.

Prediction of (Morari) Tree

Morari tree is the source of the prediction of the rainfall. In the rainy seasonal this tree drops leaf and become change in has physical look then the indigenous people predict that there will be rainfall. But it does not give every time this indication it only gives in the month of June and July. In the rainy season this tree don't drops has leaf so then no chemically are physical change occurs in this tree then the people of thar predict that there will be not rainfall. This is also very useful tree in the prediction of rainfall because due to rainfall they use it in their fields and survive their lives happily.

Prediction of Caper berry (Kirrir) Tree

Caper berry (Kirrir) tree is the source of the prediction of the rainfall. It gives the indication in the June, July naturally. The indigenous people of Thar observe its behavior in the field during these months if it gives three corps then it is considered that no rainfall will be done. Otherwise there will be rainfall. The people of the Thar survive by the cultivation in rainy season this (Kirrir) tree grows and gives three time fruit in a single season. The people of Thar predict that there will not be rainfall. If this tree become shrieked till rainy season, and don't grow then the indigenous people predict that there will be rainfall in thar. The indigenous people have good belief on this tree, and they say that this tree knows the season of rainfall. The fruit crops of this tree are also used as fruit.

Prediction of (Ghamabat) Tree

The Ghamabat tree is also an important indicator in making a prediction of weather. As they are Ghamabat also appeared in different months but the prediction of rainfall is only done in the months of June, (Akhaar) bear a big important of cause of rainfall said by the people of Thar. But this tree shrinks and does not look green and drops its all leaves. Then the indigenous people predict that there will be rainfall. If this tree in the rainy seasonal does not drop its leaves and branches, there is no chance of rain.

Prediction of (Beesori) Tree

This plant is also used by indigenous people for prediction. This tree grows from months before the rainy season. The indigenous people predict that there will be rainfall after four months and if this tree does not grow then there will not

be any rainfall. This prediction is done in the months of February and March. The aged and experienced people of the Tharparkar do these predictions by specially go to their fields. Like other sources of prediction this is also very important source of prediction these people also wait for this prediction that this will give the indication of rainfall and it will be rainfall so their fields will be cultivated and that is only their source of income.

Prediction of (Fough) Tree

Fough tree is the source of the forecast. In the first months of rainy season; it gives the indication in the June, July naturally. The indigenous people of Thar observe its behavior in the field during these months if it gives three corps then it is considered that no rainfall will be done. Otherwise there will be rainfall. It grows and gives fruit which the native peoples use as a food. After giving its fruit, this tree is covered with net. Its physical looks change and it looks like a very old tree. The indigenous people predict that there will be good rainy season. If this tree is not covered by a natural kind of net, it looks do not change and the indigenous people conclude or predict that there will be no rainfall.

Prediction of (Baviri) Tree

This Baviri trees is also the main source of the prediction for the rainfall by the people of the Thar. This tree is one of the rapidly growing trees in Thar. The people of Thar used his leafs to cover the roofs of their homes. The people of Thar beliefs and has lots of surety on this tree for their predictions to rainfall. With the help of this tree, the indigenous people measure that how much or less is rainfall in the rainy season of Thar. Indigenous people predict by this tree that in the rainy season all plants will become green but if this tree does not become green then they predict that still there will be more rainfall. But when this tree becomes full green, the indigenous people predicts that there is going to be end of rainy season. This prediction of rainfall is done during the months of July and August mostly native months Jet and Sawan respectively. It is also used to predict the rainfall not in Tharparkar only but it is also used to predict the rainfall in other areas of the other countries as well like India. This is a very important source of prediction the rainfall because these people rely on field cultivation and this can only be done by the rainfall source.

Prediction of Insects

The Insects are also the main source of foretell of the rainfall by the indigenous people of Tharparkar. These people do this prediction in the months of June and July by the people of community. They do the prediction in their home because they appear naturally before the rainfall so these people easily understand the prediction of rainfall. The indigenous people predict that when some insects move to upper areas of land and plants including their babies, the people predict rainfall. These predictions are very easy to do and they also wait for these insects to come out from earth so that there will greater probability of rainfall and it is very important because they rely on the field cultivation and it is only possible by the rainfall.

Prediction of Children

Like other source of indication this is also one of the main sources of the forecast of the rainfall. And it is naturally that all the children in all months do not do not do any kind of activity but in the months of June and July their native months are respectively *Akhaar*and *Sawan*. One of the indictor is this that children do activities like making small houses and plugs in small fields of cultivation. This is also a source or indictor of prediction for indigenous people. They believe that there will be rainfall in the season. Every child does different type of activities like some children make the houses, others Do different activities.

Famine Throughout the Tharparkar

Plants are used as temporary food by the people of the Tharparkar desert during periods of famine. The consumption of little known foodstuffs in times of seriousdisaster is predictable as a form of suppleness. Several indigenous crop species are defined which might be developed and consumed to avoid a great deal of suffering. The information could be an indicator of the degree to which area may be travail silent shortage. These natural phenomenon may be related to wind direction, lightning in the Sky,cloud pattern, position of planets, behavior of animals, birds and changes in plants, etc.Desert rural folk in Tharparkar observe drought as a multi-dimensional phenomenon variable from meteorological to biophysical to socio-cultural socio-religious aspects. Connected with these concepts, local people described drought-induced problems, suffering sales of land and livestock personal resources, set-backs to occupational caste's economy and loss of crop-livestock production. Changes in climate and vegetation appearances, animal behavior and social behavioral activities like color of clouds, their location, magnitude and frequency of rainfall, infrequent behavior of ants, birds, rats and winds. The predictions based on these indicators and human feelings livelihood the early warnings delivered by the elders to enable the community to cope with the predicted natural hazard are usually believed to be indicators for drought prediction. This case study focuses on traditional revision practices used by helplesslocal communities in the drought-prone areas of district, Tharparkar Sindh. Communities here already tolerate the effect of drought and have cultured to cope. Consecutive droughts over wider geographic areas, joint with other compressions, now threaten to upset coping capability in behaviors that might become the custom with climate change. New adaptation strategies have been introduced in the district by local non-governmental organizations that shape on existing knowledge and proficiency about water, cultivation and livestock management. These include: growing new crops such as vegetables, fodder and higher value medicinal products for profitable sale; use of ecologically sound fertilizers (vermin culture);

improved storage for fodder and food grains; and improved water conservation and collecting techniques through structure of *anicuts* and digging and developing ponds and wells. These people make predictions on different times, when they watch the situation. This timing, that when they start to predict is also mentioned. After predicting they believe that they things would happen for what they head predict sometime they perform some actives by which their understand or they get such marks from which they can predict about their future these rituals actives and the beliefs on prediction are also included in this paper.

CONCLUSIONS

This present research work examines the local perception of people about their environment, profession, culture and relationship among themselves. The relationship among indigenous knowledge and natural disasters has customary greater interest in current years. New considerations around indigenous knowledge highlight its probable to improve catastrophe risk reduction strategies through combination of particular knowledge and visions into disaster teaching and early cautioning systems, both of which play a vital role in disaster hazard reduction. Various studies have discovered that anappropriate communication system together with traditional knowledge can essentially mitigate the belongings of adversities and can be cooperative in risk reduction. It is determined that a shift in paradigm from "top down" policy to a "bottom up" participating approach will be most operative and that designing a strategy framework including both scientific knowledge and indigenous knowledge is vital to facilitate tragedyhazard reduction.

Since Indigenous knowledge is essentially based on relative experience and native experience, lack of level makes it difficult to be synchronized and integrated into predictable forecasting system. Methodical documentation, quantification and consequentcombination of indigenous knowledge into conventional weather predicting system is therefore suggested as one of theapproach that would help to rally the truth and reliability of seasonal forecasting evidence under a changing climate.It mainly focuses on indigenous knowledge that is transferred through certain rituals, taboos, proverbs, and practical participation of people in different activities for the prediction rain fall. Different terminologies are used for indigenous knowledge such as local knowledge, popular knowledge, indigenous technical knowledge, rural people knowledge and traditional, Mythology or folk knowledge. This indigenous knowledge is especially related to prediction for rain fall. The people of Tharparkar where I conducted my research work have been associated with indigenous people elders. Ecological conditions have exerted great impact in shaping their culture and life style. Rain fall satisfies the food as well as economic needs of people. The people of Tharparkar give great importance to indigenous knowledge. They learn it through enculturation in community. This knowledge is manifested in different forms such as weather forecasting, local idioms, rituals, belief, ceremonies, proverbs, and taboos in Moon, Sun, Star, Cloud, Lightening, Birds, Animals, and Plants. These various forms cannot be studies in isolation from their cultural values and norms. Certain proverbs and taboos are the guiding principles of these people. The people do not das obey their elders predictions they think it like sacred. They also perform various rituals to show unity and solidarity among themselves. These people use certain natural objects in forecasting about weather such as in Moon, Sun, Star, Cloud, Lightening, Birds, Animals, and Plants. By looking at these indictors predict about certain changes in weather. They observe these objects while people of Tharparkar time of rain fall. They learned to make prediction from their elder which has been coming for the ages. They consider that as the source of their income. Due to living in the desert area there have been developed a close relationship between people and their environment. Indigenous knowledge of the people cannot be separated from their social, cultural, religious, and economic institutions. It has a great contribution in shaping of all these things.The indigenous people of the Tharparkar

district live in the desert area and 90% of the people are dependent on the rainfall and 85% are dependent on cultivation. So it is very necessary for them to predict the rainfall by various sources. They have very much low sewerage of water for cultivation so when it is raining they save water in wells, Taka, and other tubes and in their homes. And it is according to the indigenous knowledge of the aged and experienced of the Tharparkar. And it is in their belief from their ancestors. To conduct my present research work. I selected the community of indigenous people of Tharparkar. This community provided me a lot of information regarding indigenous knowledge and its role in the prediction of rain fall. Rituals and taboos are also used as important concepts in the present research work. They both provide cultural solution of problems which indigenous people in their daily life. They reinforce belief system of people and reincorporate them in community. Many rituals are performed by these people mostly during month of rain fall.

REFERENCES

1. Altieri 1995,114. Indigenous Knowledge Systems in Zimbabwe, Juxtaposing Postcolonial Theory, *The Journal of Pan African Studies*, vol.3, no.1, September 2009.

2. Adejuwon, J.O., Odekunle, T.O., Omotayo, M.O., 2007. Extended-Range Weather Forecasting in Sub-Saharan West Africa: Assessing a Potential Toolfor Adapting Food Production to Climate Variability and Climate Change. Assessments of Impacts and Adaptations to Climate Change (AIACC) Working Paper No. 46.

3. Ajibade, L.T., 2003. A methodology for the collection and evaluation of farmers' indigenous environmental knowledge in developing countries. Indilinga: Afr. J. Indigenous Knowl. Syst. 2, 99–113.

4. Chang'a, L.B., Yanda, P.Z., Ngana, J., 2010. Indigenous knowledge in seasonal rainfall prediction in Tanzania: a case of the South-western Highland of Tanzania. J. Geogr. Regional Plan. 3 (4), 66–72.

5. Franklin, 2008, p, 03. Amber Burtis. Managing Indigenous Knowledge And Traditional Cultural Expressions: Is Technology The Solution?

6. Flavier, et al.1995, p, 479 (1995)""The regional program for the promotion of indigenous knowledge in Asia", pp. 479-487 in Warren, D.M., L.J. Slikkerveer and D. Brokensha (ends) the cultural dimension of development: Indigenous knowledge systems. London: Intermediate Technology Publications. Regions: Sub- Saharan African. The World Bank group.

7. Gyampoh, B.A., M. Idinoba, J. Nkem, and S. Amisah. (2007). Adapting Watersheds to Climate Change and variability in West Africa – The case of Offin River basin in Ghana; Proceedings, Third International Conference on Climate and Water. Finnish Environment Institute, SYKE.

8. Huntington, H., Callaghan, T., Fox, S., Krupnik, I., 2004. Matching traditional and scientific observations to detect environmental change: a discussion on Arctic terrestrial ecosystems. Ambio 18–23.

9. IPCC, 2007. Climate Change 2007. Synthesis Report. An Assessment of the Intergovernmental Panel on Climate Change, Cambridge: Cambridge University Press.

10. Johnson, M. (Ed.), 1992. Lore: Capturing Traditional Environmental Knowledge. IDRC, Ottawa.

11. Karjalainen T, Kellomsˇki S, Pussinen A. Role of wood-based products in absorbing atmospheric carbon. Silva Fennica. 1994;28(2):67–80.

12. Morris, 2005 p 353 A. M. Manyatsi. 2011. Application of Indigenous Knowledge Systems in Hydrological Disaster Management in Swaziland. Current Research Journal of Social Sciences 3(4): 353-357, 2011.

13. Nyong, T., Adesina, F., Elasha, B., 2007. The value of indigenous knowledge in climate change mitigation and adaptation strategies in the African Sahel. Mitig. Adapt. Strat. Glob. Change 12, 787–797.

14. Pelto, P.J., and G.H. Pelto. 1978. Anthropological Research. The Structure of Inquiry. Cambridge University Press, New Yor.

15. Roncoli et al., 2001. A. M. Manyatsi. 2011. Application of Indigenous Knowledge Systems in Hydrological Disaster Management in Swaziland. Current Research Journal of Social Sciences 3(4): 353-357, 2011

16. Sillitoe, P., 1998. The development of indigenous knowledge—a new applied anthropology. Current Anthropology 39 (2), 223–252.

17. Sollod, A.E., 1990. Rainfall variability and Twareg perceptions of climate impacts in Niger. Human Ecology 18 (3), 267–281.

18. Warren. 1991 p, 02. Using Indigenous Knowledge in Agricultural Development"; World Bank Discussion Paper No.127. Washington, D.C.: The World Bank. Regions: Sub- Saharan African. The World Bank group. Ziervogel, G., 2001. Global science, local problems: seasonal forecast use in a Basotho Village', open meeting of the global environmental change research community, Rio de Janeiro, 6–8 October, 2001.