Chapter - I

INTRODUCTION

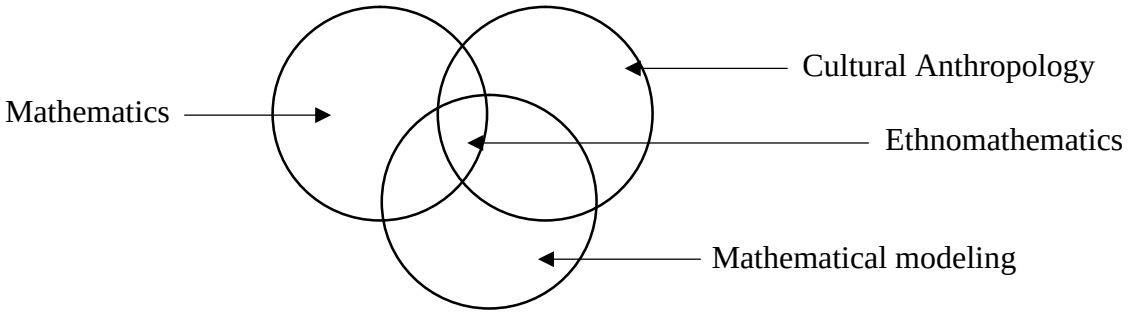
Background of Study

The concept of mathematics was beginning from the very beginning of the human civilization with the passing of the time; the gradual development of mathematics took place. In the history of mathematics Babylonian civilization, Egyptian civilization, Roman civilization, Greek civilization, Chinese civilization, Hindu civilizations and Arabian civilization have played vital role in the development of mathematics and mathematics education become an excitingly separate branch of knowledge or discipline in today's world. Ethno mathematics is the study of the relationship between mathematics and culture. It refers to a broad cluster of ideas ranging from distinct numerical and mathematical systems to multicultural mathematics education. The goal of ethno mathematics is to contribute both to the understanding of culture and the understanding of mathematics, but mainly to appreciating the connections between the two.

The term 'ethnomathematics' was introduced by the Brazilian educator and mathematician D'Ambrosio in 1977 during a presentation for the American Association for the Advancement of Science. D'Ambrosio (1985) defined ethno mathematics "as the mathematics practiced by distinct cultural group, identified as, indigenous societies, groups of workers, professional classes and groups of children of a certain age group, etc. D'Ambrosian perspective of ethno mathematics is the motive by which specific cultures developed over history, the techniques and the ideas to learn how to work with measures, calculations, inferences, comparisons classifications and the ability to model the natural and social environment in which we use to explain and understand phenomena i.e. mathema.

'Rosa and Orey (2000) stated, that Ethno mathematic intersection set between cultural anthropology and institutional mathematics and utilizes mathematical modeling to solve real

world problems and translate them into modern mathematical language system. Ethno mathematics can be shown as the intersection of the three disciplines as below:



Nepal is a multicultural, multilingual, multi-religious and multiethnic country having many tribes, castes with different languages, customs and socio-cultural lives. The land of Nepal has been inhibited by races of diverse origin. The Brahamin and Chhetri as well as occupational castes like Kami, Damai and Sarki are scattered all over the country. The Rai and Limbu are mostly found in the eastern hills. The Gurung and Magar are the inhabitants of middle hills. The Danuwar, Rajput, Tharu, Majhi, Rajbangsi, Satar, Dhimal are the dwellers of the terai and innerterai. The settlement of the Sherpa and Tamang are found in the upper hilly region and Himalayas.

The Kumals, one of Nepal's indigenous ethnic groups, are mainly found in Tanahun, Gorkha, Chitwan, Nawalparasi, Kathmandu, Lalitpur, Bhaktapur and Makawanpur. According to census Report 2068 B.S, the total population of Kumal is 17859. The majority of the tribe called the Kumal in habit the Chitwan district in the Narayani zone.

The Kumal, like other ethnic groups such as Gurung, Rai, Tamangs, and Magar etc. have their own language and culture. The Kumal people communicate in their own language. The Kumal language lacks a separate script. Gautam and Magar mentioned that these Kumals, though of Mongolian origin, now speak an Indo- Aryan dialect as do the Tharus of Terai. They are hardworking and peace loving people. These are shy in nature. The literacy rate is very low and economically very poor. Kumal are of Mongoloid stock. They have short

stature, depressed nasal roots- at the end of which they have stumpy noses and oblique eyes due to the inter section with mongoloid people. In spite of all these factors they are dark skinned. Many anthropologists have assumed that this dark complexion or skin pigmentation is a phenotypic characteristic rather than a genotypic one (Gautam and Magar, 1994).
Most of the countries in the world are multicultural, multilingual and multi-religious. Mathematics is now considered as social creation. Culture is the contributing factor for the development of mathematics. Mathematics plays vital role in the development of culture and civilization. Since ethno mathematics refers to the mathematics practiced in cultural groups, it is different from one cultural group to another cultural group. Ethno mathematics is recognized as set of mathematical practices which are known to culturally differentiated groups. Although mathematics is considered as a universal language, the way of teaching and learning mathematics such as simple operations, counting, estimating, calculation, measuring are culturally dependent and therefore are different.

Ethnomathematics is a contemporary global pedagogical trend in education. This approach has allowed a number of mathematics and educators to criticize ethno mathematics and express fears that this trend may represent a pulling away from certain cultural norms, even though some social realities underlie the need for many multicultural efforts to reform curricula. Ethno mathematics possesses important characteristic, of being able to develop the concept of mathematics. In other words, ethno mathematics may be seen as a transformational endeavor because it transforms, what mathematics really is. Thus a possible purpose of the analysis of an ethno mathematical perspective as an additional the school curriculum could be tracing the developments or transformations of mathematical ideas and practices throughout history.

We can see different kinds of objects when we travel around a culture; we find wider varieties of geometry and its application in our life. Whether is it Dhiki or Janto, Nanglo or

Dali, Mandro or Gundri, Bina or Chakati, etc. everything has a significant geometric properties that can be used in the classroom teaching and learning.

Statement of the Problem

Nepal is a multi-ethnic, multi-linguistic and multi-cultural country. Every ethnic group has its own religious, social and cultural belief. Their cultural activities have own types of important role in the national culture. So the cultural diversity and the equity of learning opportunity have been considered as one of the problem in mathematics. Kumal is one of the marginalized ethnic groups and has found to be using tribal economical activities the most backward group. Their cultural activities are different from the other castes.

Ethnomathematics is the study of mathematics which takes into consideration the culture in which mathematics arises. i.e. it is the study of relationship between human societies with mathematics (UNESCO, 1989).Thus ethno mathematics has been emerged as new issue in mathematics. No study has been conducted dealing with ethno mathematics of Kumal community in Chitwan district. Therefore, the researcher intended to study the use of Mathematics concepts by Kumal community. In this context the study has found the following question.

- What is the counting system of Kumal Community?
- How do they perform the four basic fundamental operations in their real life?
- What is the measurement systems practiced in Kumal Community?

Objectives of the study

The following were the objective of this study.

- To find the counting system used by Kumal Community,
- To find out the ways of basic fundamental operation practices by Kumal community,
- To identify the measurement system used in Kumal community.

Significance of the Study

Mathematics is one of the most important fields in today's society. Mathematics is becoming a focus of school education but student feels it as a complicated subject to grasp, Mathematics plays vital role to change the society and technology and vice-versa. So it is necessary to investigate use of Mathematics concepts in own cultural groups and what is the difference between their Mathematics concepts with formal education system. It is necessary to study that their cultural Mathematics has any influence in formal educational system. Mathematics concepts introduced in school education have some aspects, which are abstract in nature. Students, therefore, perform Mathematics concepts without necessary conceptualization. There are still alive own traditional Mathematics concepts of different communities.

The significance of this study is listed below:

- This study would help to know the nature of counting system and algorithm of basic mathematical operation practice by Kumal.
- This study would help to identify measurement system of Kumal.
- This study would help policy maker and curriculum planners to consider ethno mathematics in curriculum and text book.
- This study would help mathematics educators, mathematician and mathematics teacher and learner to understand the artifacts of culture of Kumal community that how they use Mathematical concepts.
- This study would add the new dimension and knowledge in the field of cultural mathematics.

Delimitation of study

There are many communities in Nepal with own mathematical system. The study was taken in kumal community of kalika municipality, chitwan district. This study was based own

only the mathematical ideas, concept and skills used by the kumal community in their real life.

Operational definition of terms

Mathematical Concepts: Limitation of study limited the mathematical concepts refers to the basic concept of number and its fundamental operation along with length, distance, area, volume, weight as well as how to get mathematical idea practiced by their own culture.

Kumal: Kumal refers to an indigenous ethnic group of Nepal.

Literate: Literate means being able to at least read and write General Nepali and perform fundamental mathematical operations in daily life.

Illiterate: Illiterate are those persons can't be included in the minimum definition of literate.

Formal concept: There are standard Mathematical concepts accepted by all nations in the world, which in this study defined as formal concept.

Traditional: The Mathematical concept which is different form the formal concept and refers the understanding of mathematical concepts of Kumal people is called traditional concepts.

Chapter - II

REVIEW OF THE LITERATURE

A review of related literature is important source of further study of research project. It takes the research task to be undertaken in a better perspective and essential for guidance of research planning. This chapter deals with some literatures, which were reviewed from different books and reports related to this study.

Moster (1982), Fuson (1982), Hughes (1986), save (1985) and Cobb (1983) have shown that not everyone who can count can also use counting to solve problems. The ability to use counting to solve addition a subtraction problems with age, Varnes, with situation and is influenced by schooling. These studies indicate that something more than counting is going when subjects use a counting strategy in problem solving.

Carrher (1989) studied the oral practices and described one general strategy used to solve addition and subtraction problems (decomposition) and are strategy for solving multiplication and division problems. They analyzed that the general principles underlying the written and oral strategies seem to be the same. This study shows that the written and the oral algorithm have stratified the same properties but it does not describe the difference between written and the oral algorithms, measurement units are culture specific.

CERID (1990) studied "Elementary process of learning mathematical concepts and process of Rasuwa Tamangs". The purpose of the study was to study the basic mathematical concepts used by Tamang adults with no formal mathematics education to identify traditional Tamangs method of mathematics operation and to find out the implication of Tamang processes and tone up the present learning situation. This project work has shown that Tamang have their own system of measurement, counting and their own process and geometrical concepts are based on the shapes and structure patterns of objects existing around this study has also showed the situation of children into formal

system but if did not study the effect of ethno mathematical practices in the classroom settings.

Maria Luiza Olivers Contreras (1995) presented a doctoral dissertation at the University of Granda, Sain, with title "Ethno mathematics Trabajos de Artesconla Andaluza. Su integration enunmodels Para la for macron de professors Yen la innovation Del curriculomathemiaco Escolar "(Ethno mathematics is the Artisanal work in Australia. It's integration in a model for pre service. Teacher training an, innovation of school mathematics curricula)". This important work is the result of more than 10 years of research on the mathematics identified in artistic artifacts typical of Granda. Three kinds of these were chosen for the research: Empedrados (stone pavement) Taraccas (margquetry) and Alloymbras (carpets). A very original ethnography is proposed by the author to identify the mathematical contents of these beautiful handworks. An ethno mathematical theoretical framework allowed the recognition of important styles of doing mathematics which would be unrecognizable with the prevailing views of academic mathematics. An important aspect of these is researching the way the techniques of work are transmitted among artisans, the masters and the apprentices. This was very appropriately called "ethnodidactes" by the author and the methods there observed were important in proposing a structure of teaching training through projects. We recognize there a model of training teachers to act as researchers. This important contribution to ethno mathematics will probably become a book in the series published by the department of didactics of mathematics at the University of Granda.

Kandel (2005) has studied on "The basic mathematical concepts and process of Chepang community" and concluded that: The numeration system of Chepang is a system of base- 20, Chepangs have their own mathematical process which is a simple cumulative process. They have their own traditional system of measurement. The traditional practice of measurement of Chepang community uses physical object of the environment in the practical

situation

K.C. (2008) has studied on the topic “Basic mathematical concepts and processes of Pahari community” and concluded the following. The numeration system of Pahari is base 10 Pahari has no their own separate script. Pahari of Kaverepalanchowk has their own system of counting and measurement and their own mathematical process. They have their own traditional system of measurement. Younger and literate person are becoming aware of formal system of mathematical process and measurement system.

Pantha (2007) has studied on the topic “Basic mathematical concepts and process practiced by Darai of Tanahun district” and concluded that: The numeration system of Darai is a system of base 10. Darais have their own math’s process that is a simple cumulative process. They have their own traditional system of measurement for lengths they measured with hand. Similarly the area is measured with ploughing time or grain yielded from the land, volume is measured with Mana, Pathi, Muri and weight is measured with Tulo.

Bhusal (2013) researched on the topic A Study on the Use of Geometrical Concepts by Darai Community: An Ethno mathematics Study of Chitwan District. The prime concern of this study was to explore the geometrical concepts used by Darai community. This study based on ethno mathematics is descriptive in nature. In order to fulfill the objectives of this study the researcher selected three villages of Chitwan district, named, Baheyari, KasiGaun and Ramkola for the study area and only 90 respondents were taken for interview. During the study researcher observed their daily life activities and drew necessary information. Interview and Observation were adopted as data collection methods. Coding, Shorting and Making interpretation were used in analyzing and interpreting the data. He concluded that While constructing any object, Darai make a conceptual vision of the concerning objects (i.e. size, shape) and they construct it using their indigenous method before they designed. They are not able to differentiate among geometrical objects having

different shapes (such as: sphere, circle, two dimensions and three dimensions).

From the above discussion of the related literature so many studies have been carried around the world in this field and several ethno mathematical practices have been conducting in various places like in Brazil, Ghana, South Africa, Portugal, Spain and so on. Among these studies, some were directly related to learning strategies of mathematical concepts of different ethnic groups. Nepal is also multi-cultural country where many cultural systems are found. These cultural groups perform their mathematical concepts by their own style/method/way. But a few researches have been made on use of mathematical concepts of these cultural tribes.

In this context, the review of above literatures motivated the researcher to study the use of mathematical concepts by Kumal community. Therefore, on this ground, the researcher undertook this study.

Theoretical Literature

In this chapter, the researcher introduces the theoretical discussion, which is relevant for the interpretation of the findings of the study. There are various theories related to children's learning and development. They are classical conditioning, operant conditioning, Gestalt theory, social constructivism, radical constructivism and so on.

For the study, only the constructivist theory and Vygotskian theory of social construction have been used for the interpretation of finding of the study. They are described as follows.

Social Constructivism

L.s Vygotsky was famous scholar who emphasizes on the social constructivism. Social constructivism is a theory among several theories on constructivism. The researcher has been used Vygotskt's theory for this study that every knowledge is socially constructed and children learn when they get contact with outer environment either verbally or

observantly. Vygotskian theory is one of them that regards social interaction between peers and adult as important aspects in creating meaning, making sense and conveying cultural within the shared context.

The social constructivism is the trend within the modern field of social knowledge. Social knowledge is an epistemological discussion of how knowledge is created and acquired. Social constructivism focuses on actual production of scientific knowledge. Therefore, it is not merely study of how social factor and practical experiences influence scientific facts.

Vygotsky stresses the child learns something first on the social level, then later on the individuals levels. It means children develop their skills through playing or increasing with peers and other adults. This means that social level takes first for initiation of the learning. The individual's child then internalizes the skill. In the words of Vygotsky through such inter-psychological process at the individuals levels e.g. Emotional and cognitive structure. Therefore, internalization is the process by which the inter-psychological become the inter-psychological, so not a simple transfer from external activities to performed cognitive structures. The learning is thus facilitated through speech, social interaction and co-operative activities.

Vygotskian theoretical discussion reveals the psychological perspectives and describes about insides of the individuals. In other word, it is more focused on the individual behaviors relation to society Vygotsky's theory of ZPD (Zone of Proximal Development) was helpful for me to build theoretical frame to understand the behavior of Kumal people as outside of the classroom. I have drawn the idea from ZPD that human behavior is determined in the form of language, culture, situation, communication and social factors have influence in the human behaviors.

Vygotsky describes a theory that "Zone of proximal Development (ZPD)" In this theory, the child needs some mediators like parents, teacher and adult or peers to uplift

his/her knowledge, from the knowledge that already existed with him/her. The children's construction of knowledge is not from only individual but also the surroundings context and the interaction with more knowledge of others. Schiitzi (2002) describes Vygotskian zone of proximal development. He says it is the difference between the child capacity to solve problems on his/her capacity to solve them with assistance. In other words the actual developmental level refers to all functions and activities that a child can perform independently. On the other hand the ZPD includes all the function and activities that child or a learner can perform only with the assistant or some scaffolding process providing non-instructive intervention could be an adult such as parents teacher and a care taker.

Vygotsky stresses that the child construct the knowledge from maturation and culture. Here the eternal culture knowledge is internalized with the help of community. So the psychological function in these children originated in interaction with outer or interpersonally and only later become interpersonal.

Vygotsky stresses child is social which is present right from the beginning as he/she arrives into the complete word of social relationship and culture. The culture itself has an historical development. Vygotsky states that child development is organic growth and maturation is known as natural line. Psychological function is known as cultural important. Both these processes of development meet at certain point mediated by speech and cultural forces of development are equally important. He believes on the role of the cultural in development of child, which is transmitted to them by parents, adults or peers.

For Vygotsky, the knowledge of children is expressed in children's egocentric language as cognitive end, which is interlized by the growing of the age. The language is originally and primarily social. About the children thinking process, Vygotsky feels that child think syncretic ally about unfamiliar situation or object. Vygotsky emphasized on interaction. For him mind an active, organizing principle, collaborating with the environment in

transforming thought towards an increasingly dedicate adaptation of thought to things and thing to thought.

Cognitive Constructivism

The fundamental postulate of cognitive constructivism is that reality does not directly reveal itself to us, but rather it is subject to as many, alternative ways of constructive it as we can invent. In over effort to anticipate experience each of us develops coherent system of constructivists and attempts to impose them upon the event with which she is confronted (George Kelly, 1999).

The constructivist hold that perception or cognitive is largely influenced by cultural, and the form that takes is shared interpretive. Schemes and organizational strategies. It says that human action, how we can act in the world, is guided by relevant intension and belief produced by our schemes of interpretation; the interpretive schemes suggest alternative line of action; we than apply action schemes, or strategies.

George Kelly, whose work cognitive constructivism is based on, holds that have a mechanism for arranging perception on the basis or by means of constructs, we see similar events in similar or different context, we are able to construct the similarities and observe on the basis of both similarities and difference otherwise we couldn't really categorize.

Constructivism

Simply, Constructivism means a kind of consideration about themes and builds up a string mental plan. So different individual have their own construction about existing phenomena. Learning mathematics requires construction not passive reception and to know mathematics requires constructive work with mathematical object in a mathematical community.

Constructivism is a philosophy of learning founded on the premise that by reflecting on our experience, we construct our own understanding of the world, we link in each of us,

generates our own “rules” and mental models which we use to make sense of our experiences. Learning therefore is sin[ly the process of adjusting our mental models to accommodate new experience.

A measure theme in the theoretical framework of Burner is that learners construct new ideas or concepts based upon their current/ prior knowledge. The learner selects and transforms information, construct hypothesis and makes decision replaying and cognitive structure to do cognitive structure (i.e scheme mental models) provides meaning and organization to experience and allows the individual to “go beyond the information giving.”

It is obvious that people make their own meaning from their own beliefs, construct new ideas from what they observe listen and perceive. They do not always use the taught method to solve the problem, they use their own strategies too.

Z.P. Dinese communicated that children should learn by “physical action and mental reflection” through their own experience. Constructivism assume that learners construct their own knowledge on the basis of interaction with their environment, in this context Piaget writes, “Knowledge is not passively received rather knowledge is actively created by student. Mathematical idea are made by learner not found like a pebble or accepted from other like a gift.”

Concerning the psychological aspect Piaget stresses on the key work “Action” through which the advocates that knowledge is gained. He said that the essential way of knowledge the word is not directly through our senses, but primarily through our action. Action is understood a being all behavior by which we cause a change in the world around us or by which we change our situation in relation to the world.

Psychologist Piaget, J. Bruner and Dines provide three different postulates about construction of knowledge. They are as follows;

- Knowledge is physically constructed by learners who are involved in active learning.

- Knowledge is symbolically constructed by learners who are making their own representation of action.
- Knowledge is socially constructed by learners who convey their meaning making to other.

Constructivism is a theory among many, basically a theory based on observation and specific study about how people learn. It says that people construct their own understanding and knowledge of the world, through experiencing thing and reflecting on those experiences.

Upadhyay (2003) states that mathematics is an art, art demand creativity, creativity are an individual trait. Constructivism considers the every aspect of learner and tried to carry out his increase curiosity to the students about an object.

Chapter - III

METHODS AND PROCEDURES

`Research methodology is a science, which determined how to complete the research systematically. In this chapter the researcher presents the methods and procedure of the study. This would be carried out to achieve the objective of the study.

Design of the Study

Design of this study would be qualitative. The research has different approaches to its subject matter such as multi-method in focus involving an interpretive, naturalistic inquiry. This means that a qualitative researcher has to study things in their natural settings, attempting to make sense of phenomena in terms of the meaning where the people bring to them. It was conducted on the ethnographic basis and the nature of this study was of descriptive type. Researcher used observation and interview as method for searching the mathematical concepts used by Kumal community.

Respondent of the Study

This study was conducted at Chitwan district. It was done only in Kumal community. Kumal people were living in many villages of Chitwan district. Among them, only Kalika Municipality selected as study area The sampling design is purposive. The study was consisted adult member above 50 years. Who was directly involved his/her traditional culture. For the study were selected 12 members. Among them 6 were male and 6 were female.

Technique tools of the Study

There are many approaches for qualitative research to get information. Interview observation field note and related and unpublished documents used to collect the data.

Interview Schedule

Interview is an informal technique which has used as field instrument for the research.

The interview used to collect the general information of the research area and their issues. Research conduct the study through the interview method. The researcher asked the questions to selected 12 persons above 50 years from Kalika municipality. Among them 6 were and 6 were female. The major themes of interview to find out the actual mathematical activities practice in their real life.

Observation

Observation technique also applied for learning about the mathematical practices physical infrastructure influence of the practice in their day to day life. This technique was to find the additional descriptive information before during and after other form of data collection. The researcher observed their house construction handwork construction, customs, playing, culture, festivals, measurement system, counting system and their daily activities.

Related published and unpublished documents

Researcher also reviewed different published and unpublished documents like books personal diaries, research reports, case study, journals etc. for this study.

Validity and Reliability of tools

The researcher used crossing matching methods to find validity and the expert specialist and supervisor of the study has checked the reliability and validity of the tools which has been use in the research.

Data Collection Procedure

There was many approaches for the qualitative research to get the information from the people about their experiences, ideas, believes, case histories, personal diaries and other documents. To accomplish the objectives of the study, the researcher had taken many procedures. To collect the data the researcher used the primary (Interview and observation) and secondary source of data.

Data Analysis and Interpretation Process

The collected information's at first categorized according to the different mathematical process and measurement systems and then different themes were given in the text of the observation and interview note. The similar code version of the respondents were collected together and explained in their perspectives. The validity and reliability of the result was maintained by cross matching.

Chapter – IV

DATA ANALYSIS AND INTERPERTOTION

This is a case study related to find the mathematics concepts practiced in Kumal community. The objectives of this study were the counting system used by Kumal community. This ways of basic fundamental operation practices by Kumal community. The measurement system used in Kumal community. The study area was Kalika Municipality in Chitwan district. The respondent of the study was consisted adult member above 50 years who was directly involved his/her traditional culture. For the study were selected twelve members among six were male and six were female. In this study data collection tools were interview, observation, published and unpublished documents. It was qualitative type research. He used qualitative tools for data analysis such as editing, classification organization and tabulation of data. How to operate fundamental operation practiced by Kumal community was organize his own idea. The measurement system which was practiced by Kumal community compared with scientific system.

This chapter has been divided into three Sub-stations. The first section deals with counting system, second with math process and third with measurement system.

Counting System

The process of count number is called counting system. There are many types of counting system.Counting system made the every moment of life; like money, day, time, distance, volume, weight, area etc. Some people count Hindu Arabic, Devanagari, Roman system with help of stone, grain, finger. In this study, kumal had own counting system. That was used grains small stone, fingers of hand and feet's etc.

Through the observation and interview, I found that the Kumal used positive real number in their everyday life. In measuring process, they widely used the positive real numbers. Their script is not found widely in their culture. Mostly Kumal was used

Devanagari counting system. The compare each number with Physical objects while counting. It was found counting was made easier by using corns grains, small stones, fingers of hands and feet's etc.

The Kumal numeration system is base 20; however they have their native name to 10 numbers.

Table No 1.

Kumal	English	Nepali
Katti Nakhai Hakau	Sunya	Zero
Eka Hakau	Eka Ota	One things
Dui Hakau	Dui Ota	Two things
Teen Hakau	Teen Ota	Therr Things
Char Hakau	Char Ota	Four Things
Pach Hakau Chha Hakau	Pach Ota Chha Ota	Five Things Six Things
Aat Hakau	Aat Ota	Eight Things
Nau Hakau	Nau Ota	Nine Things
Das hakau	Das Ota	Ten Things

Kumal's native numbers name for number.

Most of Kumal people cannot say their counting number but some adult people can say. Most of Kumal used Hindu-Arabic numeration system. In actual practice they used base 20.

Some numeration system in Kumal as given below:

Table No-2

Kumal	Nepali	English
Bisa (Eka Bisa) Hakau	Bisa Ota	Twenty Things
Tis (Eka Bisa Das) Hakau	Tis Ota	Tirty things
Chalis (Dui Bisa) Hakau	Chalis Ota	Forty Things
Pachas (Dui Bisa Das) Hakau	Pachas Ota	Fifty Things
Sathi (Tin Bisa) Hakau	Sathi Ota	Sixty Things
Sattari (Tin Bisa Das) Hakau	Sattari Ota	Seventy Things
Aasi (Char Bisa) Hakau	Aasi Ota	Eighty Things
Nabbe (Char Bisa Das) Hakau	Nabbe Ota	Ninty Things
Saya (Pacha Bisa) Hakau	Saya Ota	Hundred Things

Kumals higher counting more than 20.

Kumal number system expressed in base 20. For example 43 is expressed as “Dui Bisa Teen” (two twenties and three. The younger and literate person were able to use the formal system (Hindu Arabic system and they were practicing in business and others work in interacting with others community person. So they used formal system of coming for greater number in their community. Kumal numeration concepts and counting process like as Magar. Magar also used numeration system is base 20.

Recording System

Kumal had no written language and numerals all the mathematical work is done orally. Their recording system was not same for all in their community. They didn’t have any symbol to represent the particular number. They used grain stone and mainly hand finger for the solution of mathematical problems. Smaller amount record in memory. These were only for short period. For the long period record they mark in house wall make knots in the rope

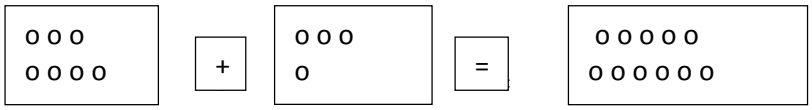
according to their code. Most of people used in Devnagari number system. The recording system of other casts (Magar, Gurung, Tamang) like as a Kumal.

Basic Operation (Math's Practiced)

In this section presented mathematical practiced in Kumal community. (100 Kumal people perform mathematical). The researcher has tried to describe the process of adding, subtracting, multiplication any dividing practiced by Kumal people in their real life activities.

Addition

Kamal numeration system in base 20. So they expressed any number on the group of 20s. The small two numbers add together, First number count and second number count and at last these two number are count together and find result. With help of grain stone. For example: If you have 7 cows and 4 cows are buying. Find the total cows.



The greater numbers add expressed in groups of twenties and remaining number. To add two numbers they put set of groups of twenties in one side. Put the set of remaining numbers in the other some questions of addition with same respondents of Kumal. Questions "What is the number altogether between Eight twenties and four (one hundred sixty four) and three twenties and eight (Sixty eight)? (Gayn Bahadur Kumal, Ward No.6, Kalika) The questions was asked by providing small stones of two group of 164 and 68).

He first, expressed both numbers in the groups of twenties and remaining. The number represented as first eight twenty and four, second is three twenty and 8. Then after he put together group of twenties in one side and remaining number in another sites. Then after the group of eight twenties and three twenties make eleven twenties and four one and eight one make Twelve one. So in total eleven twenties and twelve ones. Thus its mathematical expression is,

164 = (8 x 20 + 4)

+68 = +(3 x 20 + 8)

= (11 x 20) + (4+ 8)

= 11 x20 + 12

In other question asked Ram Maya word no-6, Kalika. The researcher found same process as previous.

Question- What is the total number of three twenties and seven and four twenties and seventeen together?

She solved the problem as follows;

67 is the same as 3 twenties and seven and 97 same as 4 twenty and seventeen. Three twenties and four twenties make 7 twenties and seven and seventeen make one twenty and four. Altogether eight twenties and four. Thus its mathematical expression is;

67 = 3 x 20 + 7

+97 = +4 x 20 + 17

= (7 x 20) + (7 + 17)

= (7 x 20) + 24

= (7 x 20) + (1 x 20) + 4

= 8 x 20 + 4

In another question asked Tas Bahadur Kumal, ward no. 6, Kalika. The researcher found same process a previous.

Questions:- What is the total four twenties and five and two twenties and sixteen?

He solve problem as follows;

85 is the same as 4 twenties and 5 and 56 same a 2 twenties and sixteen. Four twenties and two twenties make six twenties and five and sixteen make one twenty and one. Thus it's mathematical expression is;

85 = 4x20+5

+56 = +2x20+16

= (6x20) + (5+16)

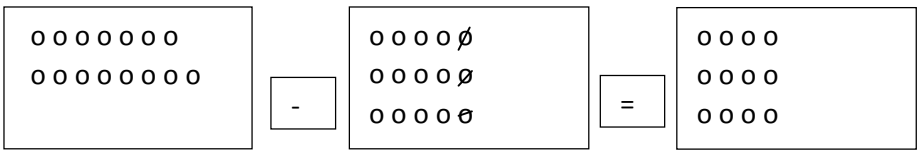
= (6x20) + 21

= (6x20) + (1x20) + 1

= 7x20 + 1

Subtraction

The Kumal people felt subtraction more difficult than addition. They subtract all number in the base of 20s. People could subtract it took them more time then addition. The small two number subtraction. First total number count second subtract number count then replace subtract number from total number help of small stone. For example- If you how is Goat and 3 goats are sold. Find how many goat you have?



15 - 3 = 12

The greater numbers subtract expressed in group of twenties and remaining number. Two numbers they put set of groups of twenties in one side. Put the set of remaining numbers in the other sides and counted researcher as Ked some question so subtraction with same respondent of Kumal.

Question: - If you had six twenties and 7 oranges (i.e. 127) and three twenties and four (ie. 64) were sold then how many oranges have you now? (Harka Bahadur Kumal, Kalika-6)

Thus its mathematical expression is;

127 = 6 x 20 + 7

– 64 = 3 x 20 + 4

= (3 x 20) + (7 – 4)

= (3x20) + 3

Question:- If you had eight twenties and 15 hens (i.e 175) and four twenties and one hens (i.e 81) were sold then how many hens have you now? (Suni Maya Kumal, Kalika -06).

Thus it's mathematical expression is ;

175 = 8x20+5

-81 = 4x20+1

= (4x20)+(5-1)

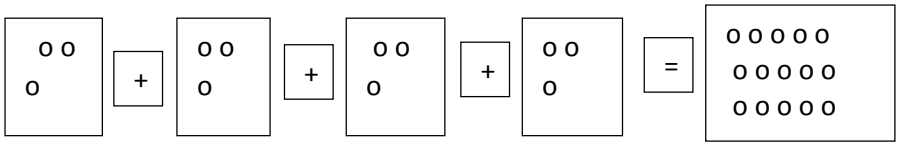
= 4x20+4

Note: - Researcher how to subtraction small number than greater number. The Kumal said we have no idea about it.

Multiplication

Multiplication is the short form of addition. Kumals Grouping process computed the multiplication problem as addition. Researcher asked same question in Kumal people.

Question: The small number of multiplication of two numbers. They multiply by help of addition. For example: If there are three hen in one place. How many hen are in 4 places?



The multiplication of greater number.

Question: If there are thirty two pigs in one places how many pigs in three places? (Pamfa Kumal, ward no- 6, Kalika)

32 means one twenty and six. Three place makes three twenties. 12 makes three places 36 (one twenty and 16). In total four twenties and sixteen. Thus its mathematical expression is,

32 x 3 = (1 x 20 + 12) x 3

= (3 x 20) + (3 x 12)

= (3 x 20) + 36

= (3 x 20) + (1x 20) +16

= 4 x 20 + 16

= 80 + 16

= 96

Similarly other question: If there are sixty four hens in one places how many hens in there in four places? (Menuka Kumal, Kalika-6)

Four places makes 12 twenties. 4 makes four places 16. In total 12 twenties and sixteen thus its mathematical expression is,

64×4 = (3×20+4)×4

= (12×20)+(4×4)

= 240+16

= 256

Division:

The Kumal people small number divided by help of grain stone for example. If you have three son and fifteen cows. Divided equally, How many cows got each son?

1st son o o o o o

2nd son o o o o o

3rd son o o o o o

Every son got o o o o o = 5

In other question asked Bishnu Maya Kumal, Kalika-6.

Question:- If Rs. 64 have to divided equally for four person how Rupees would you get ?

She solved the problem as follows.

(40 + 20 + 4) ÷ 4

=40 ÷ 4 + 20 ÷ 4 + 4 ÷ 4

= 10 + 5 + 1

= 16

Similarly other question: If Rs. 248 equally divided for four person. How many rupees would you get?

(Jagat Bahadur Kumal, Kalika-6)

He solve the problem as follows:

= 240+8) ÷4

= 240÷4+8÷4

= 60+2

= 62

3×20+2

= 3 twenties and two

Kumal people mostly used addition and subtraction in daily life. They used simple type addition and subtraction. They used some time multiplication and division. Kumal people think that is not necessary multiplication and division. The researcher asked the question about multiplication and division. They told that “we don’t know about it”. They use basic operation in daily life activities.

Almost so percent Kumal people in the study were illiterate among as group respondent (above so years). So they still use the method of basic. Now a days younger Kumal people solved real life mathematical problem by using Hindu-Arabic system.

In last Kumal and Magar used same additional, subtraction, multiplication and division process in their traditional system but nowadays they used modern mathematical concepts.

Measurement system:

Through the observation and Interview, I found, the measurement system of Kumal is still traditional. But new generation of Kumal used modern system of measurement tools to measured.

Measurement of length and Distance

The measurement the standards is the distance between the elbow and the tip of their Kumal and Nepali system. The shorter length is measured in terms of thumb fingers width called amal in Kumal and Nepali. More over shorter length is measure in kuret. Which is distance between tip to the thumb to tip of the pointer finger. More over Kuret is called bitta. Which is between tip of the thumb to tip of middle finger.

Length Conversions

9 Amal = 1 Kuret

10 Amal = 1 Bitta

2 Bitta = 1 Haat

The people used these units as lengths to measure the length and breadth of house making bhakari, making gundri. It is found that some people known about meter centimeter, kilo meter etc. The Kumal Carpenters and house builders have the knowledge about inch, foot, etc. Kumal people find out long distance they used Gaja. For example bijg amount of land they measure in Gaja. According to them 1 Gaja = 2 Hatt.

Area Measurement

Measurment of area is mostly the reflection in estimating farm land and building house gota and ‘khor’ some other area in. Naglo, Doko, Gundri, Chakati, Janto, Dhiki, Mandro, Dali, Soli etc. Kumal used of measurement is one to one verification. For example the size required Gundri is made with size of another appropriate in Gundri in mind or in consideration of the place which it has to cover.

In the construction of house they estimate area of land by measuring a rope to the requied shape. Rope of fixed measurement of length and breadth with handmade which are used to measure required length of the ground.

The Kumal family were joined family . So there house are rectangular shape and small room. To make Chakati, Dhakiya and other things they make in the basis of fero.

Most of the farmland of Kumal people measured dur. Kattha, Biga, Aana, Ropani. Area conversions of field.

13 Ropani = 1 Biga

20 Kattha = 1 Biga

20 Dhur = 1 Kattha

16 Aana = 1 Ropani

16 Dam = 1 Aana

Volume measurement

Unit of volume measurement of Kumal are mana, Pathi, Muri etc. The smaller measurement unit is muthi and bigger unit is muri. The widely used unit are mana pathi and muri.

Conversion of Volume

1 muthi = 1 Mana

1 Kuruwa = 2 Mana

8 Mana = 1 Pathi

20 pathi = 1 muri

14 Pathi = 40 Kg

Grains of corn, beans, rice, millet, wheat etc. are measured in a mana and pathi Kumal people used to measured liquid quantity by lota and Gagri. Ghee water, Oil measured by liter.

Conversion of volume of liquid

500 ml = ½ ltr.

1000 ml = 1 ltr.

Weight measurement

In Kumal, weight measurement is mainly used by tulo. Tulo is made of iron bar and has a fixed blob of mass on one side. The suspension could be shifed at different measure marks on the iron bar to balance the weight. Different measures marks on the iron bar called dhak. Most of Kumal people used traditional type of units. These measurement units are ser, Kharni, bisauli etc.

Conversion of weight

4 ser = 1 bisauli
8 ser = 1 dharni
2 bisauli = 1 dharni
1 dharni = 2.5 kg

New Generation of Kumal people used morden weight measurement tools like, gram, Kilogram, quintal, Ton etc. literate Kumal people are using modern system but they also know about their traditional weighting system.

Time measurement

In the measurement of time in Kumal community people by second, minutes, hour day, week, year etc.

Conversion of time

60 second = 1 minute

60 minutes = 1 hour

24 hour = 1 day

30 day = 1 month

12 months = 1 year

365 days = 1 year

Chapter – V

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATION

This chapter includes summary, finding, conclusion and recommendation, summary of this study.

Summary:-

Each and every Kumal were in the frequent use of mathematical manner & process which are practiced in their culture to solve their different kinds of problem. But many Kumal were still unknown about use of mathematics in their daily activities. They are using mathematics on their culture, costumes, festivals etc. The study was concerned with identifying the existence of mathematical concepts practiced by Kumal people in kalika municipality of Chitwan district. Kumal hasn't specially their own counting system in their language. They practice mathematical concepts like making gundri, like ploughing, building etc. but they unknown about formal mathematics. Most of the mew generation's kumal were known about use of mathematical concepts & practiced. They are rich in their culture. They celebrate their great festival chandi purnima in every year their literacy rate isn't satisfactory.

Ethonomathematies is a contemporary global pedagogical trend in education. Ethonomathematies processes important characteristics of being able to help the concept of mathematic. The result of this study should help for policy maker & curriculum planner. The researcher had started his research by preparing interview guidelines for the series interviews on the basic of Kumal activities with the help of teacher, social worker, old age of Kumal's the researcher had selected 12 person as respondent to collected data, researcher adopted mainly there methods: interview, observation, field note and related asked & their answer was recorded in note copy. The researcher Kumal activities by observation.

Finding:

The finding of the study as given below:

- Kumal have special their counting number 1 to 100 in their Kumal Language, like Eka Hakau, Dui Hakau…..
- Kumal have base 20 numeration system.
- Kumal has no their own separate script. So there is no any special symbol to represent the number.
- Kumal solve the problem of addition, subtraction, multiplication & division from different method by using stones, grains of corn & fingers.
- Kumal people solve the problem about simple lengths measured by hand & figure. The units of length are aamal, Kuret, bitta & Haat.
- Kumal used haat for area measurement of constrictions new house.
- The volume of measured with different types of their tradition pots; mana, pathi. Their traditional units of volume are; muthi, mana pathi & muri.
- Kumal people measureal the weight by their traditional measurement device 'Tula' the units of weight were; dharni, bisauls, ser.
- Literate & young Kumal's are becoming aware of formal system of mathematical processes & measurement systems.

Conclusion

There are many different ethnic groups in Nepal. Which have their own traditional mathematical ideas. Among this large ethnic group, this study is concerned with the mathematical ideas & measurement system of Kumal people. This study of Kumal community has conducted that: their own traditional system of counting mathematical operation measurement but nowadays Kumal people used their traditional mathematics concept and many people used modern mathematical concept in their daily life.

Recommendations:

This study was limited to several aspects; the finding of this study may have covered in limited area. So considering this limitation & on the basis of the present study, the following recommendations have been follows;

- Nepal is diverse multicultural country so there are many difference ethnic groups, which have their own types of culture. Thus similar study can be extended in other ethnic groups.
- A similar study can be extended in other subjects as well.
- Kumal has their own counting system so they have to develop their own writing script & introduced with themselves as well as possible.
- This study had been conducted in few days field work, so that a study can be done intensively.
- Kumal counting system should be introduced in school curriculum & textbook for primary levels of Kumal students.

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APPENDIX – I

INTERVIEV GVIDELINES

To draw the information for the research work entitled “Mathematics concepts practiced in Kumal Community”.

Name: ……. Sex: ……

Address: …….. Age: ……

Educational Status: ……

Part – 1: Counting system

i. How many numbers of domestic animal do you have?

ii. How do you count money?

Part – 2: Basic Operation

a. Addition:

i. If you have 12 cows and 8 goat than how many animals do you have in total?

ii. If you have Rs. 54 and Ram give Rs. 62. How many total money do you have?

b. Subtraction:

i. If you have 17 mana milk and you sold 8 mana milk then, how many milk are left?

ii. If you have 36 goats and you sold 21 goat, then how many goats do you left?

c. Multiplication:

i. How much money you should pay of 8 liter ghee?

ii. How many babies are there if every 3 cow have 2 babies?

d. Division:

i. You gave Rs. 125. If you want to divide this money equally to five children then how much money will each child get?

ii. If you have 20 apples then how do you equally divide for 5 persons?

Part- 3. Measurement System

a. Length/ distance measurement:
    i. How do you measure the length to make before mew house?
    ii. How do you measure the length and breadth of making Bhakari?
b. Area measurement :
    i. How do you measure your land?
    ii. How do you measure the area of Gundri?
c. Volume measurement :
    i. How do you measure corn, rice, maize etc.?
    ii. What are the measurement units to measure milk and ghee?
d. Weigh measurement;
    i. What are the weight measuring units?
    ii. How do you sell apples?
e. Time measurement ;
    i. How do you know what time it is?
    ii. What do you say to days of a week?

APPENDIX – II

Place value Number system of Kumal

English	Nepali	Kumal
0	Sunya	Katti Nakhai Hakau
1	Eka	Eka Hakau
10	Dasa	Dasa Hakau
100	Saya	Saya Hakau
1000	Hajar	Hajar Hakau
10000	Dasa Hajar	Dasa Hajar Hakau
100000	Lakh	Lakh Hakau
1000000	Dasa Lakh	Dasa Lakh Hakau
10000000	Karod	Karod Hakau
100000000	Dasa Karod	Dasa Karod Hakau
1000000000	Arab	Arab hakau
10000000000	Dasa Arab	Dasa Arab Hakau
100000000000	Kharab	Kharab Hakau
1000000000000	Das Kharab	Das Kharab Hakau
10000000000000	Nil	Nil Hakau
1000000000000000	Padma	Padma Hakau
100000000000000000	Sankha	Sankha Hakau

APPENDIX – III

Interview consultant Kumal

S.N.	Name	Age	Sex	Address	Occupation
1	Gayn Bahadur Kumal	58	Male	Kalika-6	Farmer
2	Harka Bahadur kumal	60	Male	Kalika-6	Farmer
3	Ram maya Kumal	57	Female	Kalika-6	Farmer
4	Shree Ram Kumal	63	Male	Kalika-6	Farmer
5	Bisnu Maya kumal	70	Female	Kalika-6	Farmer
6	Pamfa Kumal	65	Female	Kalika-6	Farmer
7	Bhim Bahadur Kumal	72	Male	Kalika-6	Farmer
8	Menuka Kumal	55	Female	Kalika-6	Farmer
9	Hira Maya Kumal	68	Female	Kalika-6	Farmer
10	Tas Bahadur Kumal	72	Male	Kalika-6	Farmer
11	Jagat Bahadur Kumal	66	Male	Kalika-6	Farmer
12	Suni Maya Kumal	69	Female	Kalika-6	Farmer

APPENDIX-IV

Some of the Different Numbers Counting Systems in Nepal

English	Nepali	Kumal	Dumi	Newari	Gurung
One	Ek	Ek Hakau	Tuk	Chha	Kridyayan
Two	Dui	Dui Hakau	Sak	Nasi	Nee
Three	Teen	Teen Hakau	Suk	Son	Sumso
Four	Char	Char Hakau	Buk	Pe	PH
Five	Panch	Panch Hakau	Nek	Nya	Nga
Six	Chha	Chha Hakau	Rek	Khu	Tn
Seven	Sat	Sat Hakau	Sek	Nhay	Ne
Eight	Aath	Aath Hakau	Uuk	Chya	Pre
Nine	Nau	Nau Hakau	Nuk	Goon	Ku
Ten	Das	Das Hakau	Tuksi	Jhi	Chu
Eleven	Eghara	Eghara Hakau	Tuktu	Thichha	Chusekri
Twelve	Barha	Barha Hakau	Tuksa	Thinne	Chusenee
Thirteen	Terha	Terha Hakau	Tuksu	Jhinson	Chuseson
Fourteen	Chaudha	Chaudha Hakau	Tukbu	Thinpe	Chusephi
Fifteen	Pandra	Pandra Hakau	Tukne	Jhinnay	Chusenga
Sixteen	Sorha	Sorha Hakau	Tukre	Jhinkhu	Chusetu
Seventeen	Satra	Satra Hakau	Tukse	Jhinnhay	Chusene
Eighteen	Athara	Athara Hakau	TukkUr	Jhinchya	Chusepre
Nineteen	Unnais	Unnais Hakau	Tuknu	Jhingoon	Chuseku
Twenty	Bees	Bees Hakau	Saksi	Nee	Nbishu
Twenty one	Ekais	Ekais Hakau	Saktu	Neechha	Churtholokri
Twenty two	Bais	Bais Hakau	Saksa	Neene	Nehasusenee
Twenty three	Teis	Teis Hakau Hakau	Saksu	Neeso	Nehasuseson
Twenty four	Chaubees	Chaubees Hakau	Sakpu	Neepe	Nehashusephi
Twenty five	Pachis	Pachis Hakau	Sakne	Neenya	Nehasusenga
Twenty six	Chabis	Chabis Hakau	Sakre	Neekhu	Nehashyusetu
Twenty seven	Sattais	Sattais Hakau	Sakse	Neenhay	Nehgchusene
Twenty eight	Aathais	Aathais Hakau	Sakku	Neechya	Nehasusepre
Twenty nine	Unantis	Unantis Hakau	Saknu	Neegaon	Nehasuseku
Thirty	Tis	Tis Hakau	Suksi	Suee	Sonchu
Thirty one	Ekatis	Ekatis Hakau	Suktu	Sucechha	Sonchusekri
Thirty two	Battis	Battis Hakau	Suksa	Sueene	Sochusenee
Thirty three	Tettis	Tettis Hakau	Suksu	Sneeso	Sonchuseson
Thirty four	Chautis	Chautis Hakau	Sukbu	Sueepe	Sonchusepli
Thirty five	Paitis	Paitis Hakau	Sukne	Sueenya	Sochusenga
Thirty six	Chhatis	Chhatis Hakau	Sukre	Sueekhu	Soch
Thirty seven	Saitis	Saitis Hakau	Sukse	Sueenhay	Sochus
Thirty eight	Attis	Attis Hakau	Sukku	Suechya	Sochusepre
Thirty nine	Unanchalis	Unanchalis Hakau	Suknu	Sueegaoon	Sochuseku

Forty	Chalis	Chalis Hakau	Buksi	Pee	Plechu
Forty one	Ekehalis	Ekehalis Hakau	Buktu	Peechha	Plechusekri
Forty two	Bayalis	Bayalis Hakau	Buksa	Reene	Plechusenci
Forty three	Trichalis	Trichalis Hakau	Buksi	Peeso	Plechuseson
Forty four	Chawalis	Chawalis Hakau	Bukbu	Peepe	Plechusepli
Forty five	Paitalis	Paitalis Hakau	Bukne	Peenya	Plechusenga
Forty six	Chayalis	Chayalis Hakau	Bukre	Peekhu	Plechusetu
Forty seven	Satchalis	Satchalis Hakau	Bukse	Peenhay	Plechusene
Forty eight	Atchalis	Atchalis Hakau	Bukku	Peechya	Plechusepre
Forty nine	Unanpachas	Unanpachas Hakau	Buknu	Peegoon	Plechuseku
Fifty	Pachas	Pachas Hakau	Noksi	Nye	Ngechu
Fifty one	Ekaun	Ekaun Hakau	Nektu	Nyechha	Ngechusekri
Fifty two	Baaun	Baaun Hakau	Neksa	Nyenee	Ngechusenee
Fifty three	Tripaim	Tripaim Hakau	Neksu	Nyeson	Ngechuseson
Fifty four	Chaun	Chaun Hakau	Nekbu	Nyepe	Ngechusepli
Fifty five	Pacnhpan	Pacnhpan Hakau	Nekne	Nyenya	Ngechusenga
Fifty six	Chhapan	Chhapan Hakau	Nekre	Nyekhu	Ngechusetu
Fifty seven	Santaun	Santaun Hakau	Nekse	Nyenhay	Ngechusene
Fifty eight	Anthaun	Anthaun Hakau	Nekku	Nyechaya	Ngechusepre
Fifty nine	Unansathi	Unansathi Hakau	Neknu	Nyegoon	Ngechuseku
Sixty	Sathi	Sathi Hakau	Reksi	Khuee	Tuchu
Sixty one	Eksathi	Eksathi Hakau	Rektu	Khuecha	Tuchusekri
Sixty two	Bisathi	Bisathi Hakau	Reksa	Khuene	Tuchusenhee
Sixty three	Trisathi	Trisathi Hakau	Reksu	Khueson	Tuchuseson
Sixty four	Chausathi	Chausathi Hakau	Rekbu	Khuepe	Tuchesepli
Sixty five	Paisathi	Paisathi Hakau	Rekne	Khuenya	Tuchusenga
Sixty six	Chhaisathi	Chhaisathi Hakau	Rekre	Khuekhu	Tuchusetu
Sixty seven	Satsathhi	Satsathhi Hakau	Rekse	Khuenhay	Tuchusene
Sixty eight	Atsathhi	Atsathhi Hakau	Rekku	Khichya	Tuchusepre
Sixty nine	Unansattari	Unansattari Hakau	Reknu	Khigoon	Tochuseku
Seventy	Satan	Satan Hakau	Seksi	Nhaya	Neiliu
Seventy one	Ekatar	Ekatar Hakau	Sektu	Nhayachha	Nechusekri
Seventy two	Bahatar	Bahatar Hakau	Seks	Nhayane	Nechusenee
Seventy three	Tiratar	Tiratar Hakau	Seksu	Nhayason	Nechuseson
Seventy four	Chauhatar	Chauhatar Hakau	Sekbu	Nhayape	Nechusepli
Seventy five	Pachahatar	Pachahatar Hakau	Sekne	Nhayanya	Nechusenga
Seventy six	Chhahatar	Chhahatar Hakau	Sekre	Nhayakhu	Nechusetu
Seventy seven	Satahatar	Satahatar Hakau	Sekse	Nhyyahay	Nechusene
Seventy eight	Athahatar	Athahatar Hakau	Sekku	Nhyachya	Nechusepre
Seventy nine	Unasi	Unasi Hakau	Seknu	Nhayagoon	Nechuseku
Eighty	Asi	Asi Hakau	TJksi	Chaye	Prechu
Eighty one	Akasi	Akasi Hakau	Uktu	Chayachha	Prechusekri
Eighty two	Bayasi	Bayasi Hakau	Uksa	Chayane	Prechusenee
Eighty three	Tirasi	Tirasi Hakau	Uksu	Chayason	Prechuseson

Eighty four	Chhaurasi	Chhaurasi Hakau	Ukbu	Chayape	Prechusepli
Eighty five	Pachhasi	Pachhasi Hakau	Ukne	Chayanaya	Prechurenga
Eighty six	Chhayasi	Chhayasi Hakau	Ukre	Chayakhu	Prechusetu
Eighty seven	Satasi	Satasi Hakau	Ukse	Chayanhay	Prechusene
Eighty eight	Athasi	Athasi Hakau	Ukku	Chayachya	Prechusepre
Eighty nine	Unanabe	Unanabe Hakau	Uknu	Chayagoon	Prechuseku
Ninenty	Nabe	Nabe Hakau	Nuksi	Gui	Kuchu
Ninenty one	Ekanabe	Ekanabe Hakau	Nuktu	Guichha	Kuchusekri
Ninenty two	Bayanabe	Bayanabe Hakau	Nuksa	Guine	Kuchasene
Ninenty three	Triyanabe	Triyanabe Hakau	Nuksu	Guison	Kucheseson
Ninenty four	Chauranabe	Chauranabe Hakau	Nukbu	Guipe	Kuçhusepli
Ninenty five	Panchanábe	Panchanábe Hakau	Nukne	Guinya	Kuchusenga
Ninenty six	Chhayanabe	Chhaya nabe Hakau	Nukre	Guikhu	Kuchusetu
Ninenty seven	Santanabe	Santanabe Hakau	Nukse	Guinhya	Kuchusene
Ninenty eight	Anthanabe	Anthanabe Hakau	Nukicu	Gunechya	Kuchusepre
Ninenty nine	Unansaya	Unansaya Hakau	Nu1u	Guigoon	Kuchesoku
Hundred	Saya	Saya Hakau	Sim	Sachhi	Pra