

**Documenting Indigenous  
Knowledge in Climate Change  
Adaptation: Evidence from  
Northern Ghana**

**2021**

LINK Ghana



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2/15/2021

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## Acknowledgements

The LINK Ghana research team is very grateful to the chiefs and people of all the communities visited in this survey for their warm welcome and enthusiasm to share their knowledge for the benefit of all society.

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## 1. Methodology and Study Area

The data collection which started in 6<sup>th</sup> January, 2021 to 17<sup>th</sup> February, 2021 employed various Rural Appraisal Strategies. Eighteen (18) community meetings and 18 Focus Group Discussions (FGD) was held with the aid of guided questionnaires for data collection. Each community meeting had an average population of 47 (18m/29f) composed of the youth, aged, traditional leaders such as chiefs, clan heads, children and women groups. After each community meeting, a FGD with an average of 9 (5m/4f) persons composed of the old, youth, chief and traditional elders was held. This was necessary to triangulate the data collected from the larger community. In addition, personal observations, photos and videos documentations were deployed.

*Table 1* is a list of the study communities.

***Table 1: Study Communities, Corresponding Districts and Regions***

REGION	DISTRICT	COMMUNITY
Northern Region	West Mamprusi	Guabuliga
		Zangum
		Nayoku
		Sayoo
		Guakudoo
	Yendi Municipality	Bini
		Tusaani
		Limpua
		Kpalgagbini
		Zang
Upper East Region	Bawku West	Kusanaba
		Zongoire
		Kobore
		Sapeliga
	KassenaNankana East	Gaani
		Biu
		Kologo
		Naaga

*Source: Field work (2021)*

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## 2: Indigenous Indicators in Predicting Climatic Parameters

Communities have varied indigenous weather systems that help them in their daily and seasonal activities. The study conducted in the 18 communities shows that both living and non living things were used as indicators in weather prediction. Indicators used in predicting climatic parameters at the communities surveyed in all the 18 communities are presented in *table 2*. The degree at which these indicators are being used is also presented.

**Table 2: Indigenous indicators in predicting climatic parameters**

<b>DISTRICT: KASSENA NANKANE EAST</b>					
<b>COMMUNITY</b>	<b>INDICATOR</b>	<b>LOCAL NAME</b>	<b>INDICATOR DESCRIPTION</b>	<b>INDICATOR MEANING</b>	<b>USEAGE</b>
Kologo	Clouds	-	Masses of water or ice in the air that looks like white cotton ball	When there is extreme heat with dark red clouds gathering in the east, it is an indication of impending rainfall	Highly used
	Wind	-	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Used
	Toads	Kampone	Similar to frog: a small squat tailless amphibian distributed nearly worldwide. Has dry warty skin and, lives mostly on land.	When more than one toad croaking in the morning in an usual way then it is a signal that rainfall is expected within a day or two	used
	Mushroom	Lawoola	They are small edible and ash in nature. They are usually used for soup preparation.	Their appearance indicates that there is some moisture in the atmosphere and is an indication of the inset of the rainy season	used
	Black Ants	Kamasinsii	It is smallish and black in nature with their eggs being white.	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	used
	Bird	Pies kuo	Resembles an eagle with grey feathers	Its crying within the community is an indicator that it is likely to rain on that particular day.	used
	(Acacia Almeada) Faidherbiaalbida or winter thorn	Zaanga	Has small branches with tiny leafs	Shedding of its leaves, is an indication of rainy season setting in	used
	Tamarind tree	Pusiga	A dry fruit tree that bears a fruit resembling a bean pod	When the tree sprouts its leaves for the third time after the onset of the dry season it is evidence of the emergence of the rainy season	used
	Baobab	Tuah	Is a big thick tall tree which is edible in nature. It has smaller leafs often used for soup while its fruits look like cocoa pots	Sprouting of its leaves indicates that the rains are in and hence rainy season is close	used
Red Berries	Sinsibi	Is a short but thick tree with small edible fruits eating by birds and humans. The fruits look like grapes.	Fruits found ripening it is an indication of the rainy season	used	

	Fig	Kinkaga	Leaves are used widely as fodder	When tree starts shedding its leaves, is an indication of dry season. If it also flowers for longer periods of more than one and half month, it is a clear indication of drought	used
	Kapok	Gunga	It is a thick and tall tree with tiny leaves. Its fruits contain silky cotton like substances.	When kapok is dry and the pods are breaking it indicates the end of the dry season	used
	Sun	-	A yellow looking star at the centre of the solar system	When the sun rises and shines too much early in the morning there is a likelihood of extreme heat during the day	used
Biu	Heat	Touloug	An abnormal increase of weather temperature	When the temperature is high accompanied with still wind during the day or night it indicates a high chance of rainfall is expected.	used
	Butterflies	Kampiligu	Small, white-looking in nature and usually commonly found within human settlements	When butterflies are observed to be flying in groups towards the East it is an indication of rainfall within that same day	used
	Wind	Kusepku	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	used
	Toads	Kampune	Similar to frog: a small squat tailless amphibian distributed nearly worldwide. Has dry warty skin and, lives mostly on land.	When more than one toad croaking in the morning in an usual way then it is a signal that rainfall is expected within a day or two	used
	Black Ants	Kamasinsii	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	used
	Spiritual leaders	Tindaana	They are the land owners often noted to have spiritual powers and linkages with the ancestral or spiritual world	Through consultations by community leaders and members, some sacrifices are made for either rains to set in or stop the rains where they are observed to be too much	Rarely used

	Baobab	Tuah	Is a big, thick tall tree which is edible in nature. It has smaller leaves often used for soup while its fruits look like cocoa pods	Sprouting of its leaves Indicates that the rains are in and hence rainy season is close	used
	Red Berries	Sinsibi	Is a short but thick tree with small edible fruits eating by birds and humans. The fruits look like grapes.	When fruits are found ripening it is an indication of the rainy season	used
	Dawadawa	Dooag	A thick, tall tree with elongated edible fruits. The fruits have a brownish coat when dry with yellowish substances inside it.	The time the fruits begin to ripe and dry, is the period the rains also set in	used
Gaani	Heat	Touloug	An abnormal increase of weather temperature	When the temperature is high accompanied with still wind during the day or night it indicates a high chance of rainfall is expected.	used
	Clouds	-	Masses of water or ice in the air that looks like white cotton ball	Between June and September when extreme heat with dark red clouds gathering is observed it is an indication of impending rainfall	used
	Mosquito	Dunsa	A family of small, midge-like flies: the Culicidae. Which are a nuisance to human because they consume blood from living vertebrates	When there is a more than average heat with the presence of numerous mosquito bites at night it is a sign of rainfall	used
	Goats	Boogo	Domestic goat	When many goats are constantly bleating and in most cases running to their pens is a sign of immediate rainfall expected	used
	Tamarind	Pusiga	A wild plant which is sweet and sour in taste.	When the tree sheds its leaves for the third time after the onset of the dry season it is evidence of the emergence of the rainy season	used
	Cows	Naabu	Domestic cow	Facing east with their noses in the air is an indication of an impending rainfall	used
	Moon	Magrug	The largest natural satellite of a planet in the solar system. It often appears yellowish at night.	When there is either a crescent moon or moon seen at night it is anticipated that there could be rainfall that night or early the next day	used



	Red berries	Sinsibi	Is a short but thick tree with small edible fruits eaten by birds and humans. The fruits look like grapes.	When fruits are found ripening it is an indication of the rainy season	used
Naaga	Toads	Kampune	Similar to frog: a small squat tailless amphibian distributed nearly worldwide. Has dry warty skin and, lives mostly on land.	When more than one toad croaking in the morning in an usual way then it is a signal that rainfall is expected within a day or two	used

	Winds	Kusepku	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	used
	Black Ants	Demasinsii	It is smallish and black, their eggs are white. They do not carry their egg far away, when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	used
	Red Berries	Sinsibi	Is a short but thick tree with small edible fruits eaten by birds and humans. The fruits look like grapes.	When fruits are found ripening it is an indication of the rainy season	used
	Shea	Tama	It is a wild tree that has a gestation period of 20 years. Its nuts are brownish in nature and often used for Sheabutter.	The shea fruits mature during the rainy season, so sowing of seeds and land preparation commences when the fruits are mature	used
	Higher Temperatures	Touloug	When there is extreme humid weather	When extreme heat more than usual is emanating from the atmosphere and ground coupled with very still winds it is an indication of rainfall within a day	used
	Dawadawa	Dooag	A thick tall tree with elongated edible fruits. The fruits have a brownish coat when dry with yellowish substances inside it.	When the tree fruits in March or April then the rainy season will be good. The time the fruits begin to ripe and dry, is the period the rains also set in	used
	Baobab	Tuah	Is a big thick tall tree which is edible in nature. It has smaller leafs often used for soup while its fruits look like cocoa pots	Sprouting of its leaves indicates that the rains are about to start	used
	Acacia	Zaanga	Is a tree with small branches with tiny leafs	When the tree starts shedding its leaves, it is an indication of rainy season setting in	used

	Wild root tuber	Sanjuuse	It is a shrub like plant with a tuber root that looks like yam. It has green leaves with redish fruits when ripe	Germination of the tuber is an indication that the rainy season is closer. The ripening of the fruits of the plant indicates the rainy season has set in	used
	Bird	Palintinga	Grey wild bird with feathers like a guinea fowl	Birds observed migrating Northwards is an indication of the rainy season setting in while their migration towards Southward is a sign that the rains have just ended or close to the dry season	used
	Goats	Boogo	In the morning, you will see all	When many goats are constantly bleating and in most	used
			animals lying on the ground, not moving out to the field to graze, and no wind blowing	cases running to their pens is a sign of immediate rainfall expected	
	Sky	-	The expanse of air over any given point on the earth; the upper atmosphere as seen from the earth's surface	Clear skies at night till early dawn is an Indicator of heat throughout the next day	used
	Moon	-	The largest natural satellite of a planned in the solar system. It often appears yellowish at night.	When there is either a crescent moon orno moon seen at night it is anticipated that there could be rainfall that night or early the next day	used
	Clouds	-	Masses of water or ice in the air that looks like white cotton ball	When reddish dark clouds is observed gathering it is an indication of impending rainfall with heavy storms within that day or at night	used
<b>DISTRICT</b>	<b>BAWKU WEST</b>				
Kobore	Sky	-	The expanse of air over any given point on the earth; the upper atmosphere as seen from the earth's surface	Clear skies at night till early dawn with a higher temperature then is an Indicator of rainfall	used
	Wind	-	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	used
	Toads	-	Similar to frog: a small squat tailless amphibian distributed nearly worldwide. Has dry warty skin and, lives mostly on land.	When more than one toad croaking at night in an usual way then it is a signal that rainfall is expected within 24 hours	used

Baobab	Tuah	It's a big thick tall tree which is edible in nature. It has smaller leafs often used for soup while its fruits look like cocoa pots	Sprouting of its leaves Indicates that the rainy season is close	used
Ants	Sansaah	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If the ants are seen carrying their eggs, and changing their position then it will rain that day or the next day, it does not matter the direction or elevation.	used
Red berries	Sinsibi	Is a short but thick tree with small	When fruits are found ripening it is an indication of	used

			edible fruits eaten by birds and humans. The fruits look like grapes.	the onset of the rainy season	
	Shea	Tama	It is a wild tree that has a gestation period of 20 years. Its nuts are brownish in nature and often used for Sheabutter.	The shea tree fruits during the rainy season, so sowing of seeds and land preparation commences when the fruits are seen	used
	Spiritual leader	Tindaana or Quranic recitals	They are persons within the community who are believed to possess spiritual powers in calling rains	Consultations are made with some sacrifices and the rain is evoked to fall	Rarely used
	Clouds	-	Masses of water or ice in the air that looks like white cotton ball	Between June and September when extreme heat with dark red clouds gathering is observed, it is an indication of impending rainfall with accompanied storms	used
	Termites	-	Group of eusocial insects	When termites are seen building higher hills there is the possibility of heavy rains leading to floods. If the termite hill is lower to the ground it is an indicator of no rains or higher temperatures.	used
Zongoire	Toads	Nbgam	Similar to frog: a small squat tailless amphibian distributed nearly worldwide. Has dry warty skin and, lives mostly on land.	When more than one toad croaking at night in an usual way then it is a signal that rainfall is expected within 24 hours	used
	Bird	Duluck	Black bird (a wild duck found in the Savannah regions)	Quacking of ducks all day in numbers is a high chance of rainfall within the day	used
	Wind	Pepskum	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	used
	Shea	Tang	It is a wild tree that has a gestation period of 20 years. Its nuts are brownish in nature and often used for Sheabutter.	The shea fruits mature during the rainy season, so sowing of seeds and land preparation commences when the fruits are mature	used

	Baobab	Tuah	Is a big thick tall tree which is edible in nature. It has smaller leaves often used for soup while its fruits look like	Sprouting of its leaves Indicates that the rains are in and hence rainy season is close	used
			cocoa pots		
	Rain makers	Saadana	They are persons within the community who are believed to possess powers in calling rains	Consultations are made with some sacrifices and the rain is evoked to fall	used
Kusanaba	Spiritual leader	Tindana	They are persons within the community who are believed to possess powers in calling rains	Consultations are made with some sacrifices and the rain is evoked to fall	used
	Shea	Tang	It is a wild tree that has a gestation period of 20 years. Its nuts are brownish in nature and often used for Sheabutter.	The shea tree fruits during the rainy season, so sowing of seeds and land preparation commences when the fruits are seen	used
	Dawadawa	Duoat	A thick tall tree with elongated edible fruits. The fruits have a brownish coat when dry with yellowish substances inside it.	The time the fruits begin to ripe and dry, is the period the rains also set in	used
	Toads	Nbgam	Similar to frog: a small squat tailless amphibian distributed nearly worldwide. Has dry warty skin and, lives mostly on land.	When more than one toad croaking at night in an usual way then it is a signal that rainfall is expected within 24 hours	used
	Cattle egrets	Nnikempelig	They are white looking birds with long legs often on the backs of cattle	During the dry season they are found around because they usually feed on insects and water and migrate out when the rains set in	used
	Wild mushroom	Alegro	They are small edible and ash in nature. They are usually used for soup preparation.	When they are observed to be germinating then is a sign that the rains are setting in and hence farmers start preparing for the farming season.	Used

	Crickets		Crickets, family Gryllidae (also known as "true crickets"), are insects somewhat related to grasshoppers, and more closely related to katydids or bush crickets	When they are found in large numbers within the day it means there will be extreme heat	used
	Wind	Sapelpling	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	used
Sapeliga	Black Ants	Sansaah	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	used
	Spiritual leader	Tindaana	They are persons within the community who are believed to possess powers in calling rains	Consultations are made with some sacrifices and the rain is evoked to fall	used
	Toads	Nbgam	Similar to frog: a small squat tailless amphibian distributed nearly worldwide. Has dry warty skin and, lives mostly on land.	When there is drought in the middle of the planting season and they are heard croaking in particular areas in large numbers at night it is an indication of the end of the dry spell	used
	Heat	-	An abnormal increase of weather temperature	When the temperature is high accompanied with still wind during the day or night it indicates a high chance of rainfall is expected.	used
	Mosquitoes	Dumisii	A family of small, midge-like flies: the Culicidae. Which are a nuisance to human because they consume blood from living vertebrates,	When there is a more than average heat with the presence of numerous mosquito bites at night it is a sign of rainfall	used
	Wind	Pepsum	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	used

	Fog	Ulug	Fog is a cloud that occurs at ground level instead of in the sky	Thick fog for up to three consecutive days Indication of drought	used
	Army Worm	Nganga	They are small greenish worms that feed on leaves of green plants	When they attack the early millet is an indication of drought in the middle of the cropping season	used
	Termites	Tamben	Group of eusocial insects	When termites are seen building higher hills there is the possibility of heavy rains leading to floods. If the termite hill is lower to the ground it is an indicator of no rains or higher temperatures.	used
	Late rains		Rains starting in late July or even August	When rains do not occur early in the rainy season it indicates possible flooding later on in the year	used
	Quranic predictions		Some Islamic scholars within the community who can make predictions through the Quran	Based on consultations these scholars are able through the Quran to make prediction of rain, floods and drought	Rarely used

<b>DISTRICT: WEST MAMPRUSI</b>					
<b>COMMUNITY</b>	<b>INDICATOR</b>	<b>LOCAL NAME</b>	<b>INDICATOR DESCRIPTION</b>	<b>INDICATOR MEANING</b>	<b>USEAGE</b>
Guabiliga	Tree	“Guasabiliga”	A black thorny tree	The flowering of this tree indicates the ending of the rainy season.	Used
	Tree	“Toa”	This is big tree with a large trunk.	The Baobab tree shed off its leaves during the dry season. When the tree begins sprouting new leaves it is an indication that the rainy season.	Fairly Used
	Shea tree	“Taama”	It is a wild tree that has a gestation period of 20 years. Its nuts are brownish in nature and often used for Sheabutter.	A type of Shea seed which reddish in nature (ripe) which is collected by women. When these are seen then it is an indication of the beginning of the cropping season. Planting after 1 <sup>st</sup> two rains is favorable.	Used
	Star	“Sangbawua”	Shining object in the sky at night	The arrangement of some seven (7) stars in the shape of a hoe indicates the farming season is due.	Used
	Bird	“Duupuu” – (go to farm)	A bird with ash coloured neck and tail with a white coloured body.	When this bird is heard crying in the mornings and evenings it indicates farming period/season is due.	Highly Used

	Wind		Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Highly Used
	Rainbow	“Sansuwa”	An optical and meteorological phenomenon that is caused by both reflection and refraction of light in water droplets in the Earth's atmosphere reflecting strips of different colours in the sky	When a rainbow is seen it signifies there will be no rain.	Highly Used
	Ducks	“Gumaseere”	Domestic duck	They stay on the ground and flap their wings against the soil, just as they do in water, the rains may come the same day or it will take about two days	Used
	Army Worms	“Taantina”	They are small greenish worms that feed on leaves of green plants	These army worms feed on leaves of plants. When the numbers of these worms increases and their feeding rate increases it indicates a period of drought.	Highly used
Zangum	Black Ants	“Salinsae”	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain	This observation is normally made in the rainy season. The ants migrate (with their eggs and younger ones) from the previous burrow to a newly created one.	Highly used

			they just change their position	When this happens it indicates rainfall is expected that day or the next day. The length between the burrows and the hurriedness with which the ants migrate determines how soon a rainfall should be expected	
	Wind		Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Used
	Sun		A yellow looking star at the centre of the solar system	An intensive sunshine during the day in the rainy season is an indication of rainfall in the evening	Used
	Ducks	“Gumaseero”	Domestic duck	They stay on the ground and flap their wings against the soil, just as they do in water, the rains may come the same day or it will take about two days	Highly used



Calves	-	Young of domestic cattle	After a period of drought when calves are heard crying, it is an indication of an eminent rainfall.	Used
Toad	“Pulori”	Similar to frog: a small squat tailless amphibian distributed nearly worldwide. Has dry warty skin and, lives mostly on land.	The croaking of the toad can be used to determine a rainfall.	Highly Used
Bird	“Nachim-pilisi”	Cattle Egrets	When birds are seen in large numbers is an indication that the rainy season is ending	Used
Moon	-	The largest natural satellite of a planet in the solar system. It often appears yellowish at night.	On the first nine (9) days of the month, when the moon is half, there is the likelihood of rainfall. When the moon is full no rains will be observed. When the moon is setting, there is likely to be rains in that period.	Used
Tree	“Kumbuasuo” – never bloom in the rainy season	Acacia (winter thorn)	This tree blooms in the dry season and sheds its leaves in the rainy season. When the tree sheds off its leaves it indicates the cropping season is near.	Used
Earthworm	“Samberiga”	It lives on the ground and is long probably up to the wrist. It is pale blue in colour. It has no legs just like a snake. It has no tongue and a small head. It is as big as the	When the sun is high in the day and these worms are seen crawling around, it is an indication of rainfall later.	Used
		second finger.		
Mosquito		A family of small, midge-like flies: the Culicidae. Which are a nuisance to human because they consume blood from living vertebrates.	Persistent mosquito bites at night with warm weather is an indication of a likely rainfall the following morning.	Highly Used
Wild Ducks	“Filo-Filo”	Undomesticated duck	When these wild birds are heard crying in the night, it is an indication of a likely rain the morning.	Used

	Snails	“Gingaya”	Land snails which are have hard shell that protects their bodies	When snails are seen to be sticking themselves to stems of plants, it is an indication of drought.	Fairly Used
	Army Worms	“Taantina”	They are small greenish worms that feed on leaves of green plants	These army worms feed on leaves of plants. When the numbers of these worms increases and their feeding rate increases it indicates a period of drought.	Highly Used
Nayoku	Black Ants	“Salinsae”	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	Highly Used
	Tree	“Tuwa”	This is big tree with a large trunk.	The Baobab tree sheds its leaves during the dry season. When the tree begins sprouting new leaves it is an indication that the rainy season is approaching.	Fairly Used
	Earthworm	“Samberiga”	It lives on the ground and is long probably up to the wrist. It is pale blue in colour. It has no legs just like a snake	When the sun is high in the day and these worms are seen crawling around, it is an indication of rainfall later.	Fairly Used
	Rainbow	“Sansuwa”	An optical and meteorological phenomenon that is caused by both reflection and refraction of light in water droplets in the Earth's atmosphere reflecting strips of different colours in the sky	This normally occurs in the sky before or after a rainfall. During a period of drought when a rainbow is seen it signifies rainfall. Also when the rainbow is seen immediately after a rainfall it indicates a period of drought.	Highly Used
	Plant	“GumakyiuKpal anga”	-	When this tree starts sprouting it is an indication that the cropping season is near.	Used
	Tortoise	“Kpakpeli”	A family of land-dwelling reptiles in the order Testudines. They are shielded from predators by a shell at their back.	In a hot day, when the tortoise is seen crawling around it is an indication that it is about to rain.	Used
	Wind		Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Used

	Snails	“Gingaya”		When snails are seen to be sticking themselves to stems of plants, it is an indication of drought.	Rarely Used
Nayoku	Army Worms	“Taantina”	They are small greenish worms that feed on leaves of green plants	These army worms feed on leaves of plants. When the numbers of these worms increases and their feeding rate increases it indicates a period of drought.	Highly Used
Sayoo	Black Ants	“Salinsae”	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	Used
	Moon	“Gun”	The largest natural satellite of a planet in the solar system. It often appears yellowish at night.	When the moon appears newly in the month it is a period of likely rainfall.	Used
	Toad	“Pulori”	Similar to frog: a small squat tailless amphibian distributed nearly worldwide. Has dry warty skin and, lives mostly on land.	When more than one toad croaking at night in an usual way then it is a signal that rainfall is expected within 24 hours	Highly Used
	Earthworm	“Samberiga”	It lives on the ground and is long probably up to the wrist. It is pale blue in colour. It has no legs just like a snake. It has no tongue and a small head. It is as big as the second finger.	Comes out when it is about to rain. When you see them passing it means it is about to rain.	Used
	Rainbow	“Sansuwa”	An optical and meteorological phenomenon that is caused by both reflection and refraction of light in water droplets in the Earth's atmosphere reflecting strips of different colours in the sky	This normally occurs in the sky before or after a rainfall. During a period of drought when a rainbow is seen it signifies rainfall. Also when the rainbow is seen immediately after a rainfall it indicates a period of drought.	Highly Used

Sayoo	Wind		Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Used
	Army Worms	“Taantina”	They are small greenish worms that feed on leaves of green plants	These army worms feed on leaves of plants. When the numbers of these worms increases and their feeding rate increases it indicates a period of drought.	Highly used
	Early Rains	-	Rains that start as early as 5: 00 am	Early morning rains at the beginning of the rainy season indicates drought in the season.	Used
Boakudow	Tree	“Tuwa”	This is big tree with a large trunk.	The Baobab tree shed off its leaves during the dry season. When the tree begins sprouting new leaves it is an indication that the rainy season.	Used
	Tree	“Sinsaba”	It is a tree which bears sweet and edible berries	The tree produces sweet, reddish fruits. It normally fruits within the month of May. The ripening of the fruits produced by the tree indicates enough moisture within the soil for planting.	Used
	Tree	“Takoribaka”	Wild plant that bears reddish inedible fruits	This tree bears fruits which become reddish in nature in the rainy season. The ripening of the fruit indicates the time for planting of seeds.	Used
	Black Ants	“Salinsae”	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	
	Army Worms	“Taantina”	They are small greenish worms that feed on leaves of green plants	These army worms feed on leaves of plants. When the numbers of these worms increases and their feeding rate increases it indicates a period of drought.	Highly Used
	Bird	“Gaagan”	A black bird with a white coloured neck	When this bird makes a nest and lays eggs it indicates a period of drought. When the eggs of the bird hatch it indicates the start of the rains.	Used
<b>DISTRICT</b>	<b>YEDNI</b>				
<b>COMMUNITY</b>	<b>INDICATOR</b>	<b>LOCAL NAME</b>	<b>INDICATOR DESCRIPTION</b>	<b>INDICATOR MEANING</b>	<b>USEAGE</b>

Tusaani	Tree	“Kpagra	It is a wild plant which produces round, hard coated edible nuts that indicate a period of drought in the rainy season	The plant flowers within the months of June and July. It normally sheds off the flowers after a period of two (2) – three (3) weeks. When the plant begins to flower it indicates a period of drought. When it begins	Highly Used
				shedding its flowers it indicators a period of rainfall.	
	Tree	“Alura (Teak)”	It is a tree that has very large leaves and bears inedible fruits	The flowering of the tree indicates a period of drought. The shedding of the flowers indicates the beginning of rains.	Used
	Tree	“Baglinga”	It is a wild plant	The plant flowers within the months of June and July. It normally sheds off the flowers after a period of two (2) – three (3) weeks. When the plant begins to flower it indicates a period of drought. When it begins shedding its flowers it indicators a period of rainfall.	Used
	Tree	“Sinsaba”	It is a tree which bears sweet and edible berries	The tree produces sweet, reddish fruits. It normally fruits within the dry season. The ripening of the fruits produced by the tree indicates enough moisture within the soil for planting.	Used
	Black Ants	“Salinsae”	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	Used
	Sheep and Goats	“PeriniBuhi”	In the morning, you will see all animals lying on the ground, not moving out to the field to graze, and no wind blowing	When many goats are constantly bleating and in most cases running to their pens is a sign of immediate rainfall expected	Used
	Bird	“Shishirinonga”	It is a small bird with features coloured like that of a squirrel	This bird sleeps within the crevices of trees. When the bird is seen to be hopping from tree to tree trying to locate a place to hide it indicates rainfall.	Used

	Human	“Sabolga” or saboona	Spiritual Person within the community who can call rain to fall	This individual is considered to be spiritual and is able to communicate with the spirits. He consults the spirits and request for rain but this depends in the agreement of the Gods and so he need to appropriately prepare. They are also able to stop the rain from falling	Used
	Sun	“Wuntanga”	A yellow looking star at the centre of the solar system	When the sun rises early in the morning so bright and with no clouds in the sky it signals a warm day.	Used
	Clouds		Masses of water or ice in the air that looks like white cotton ball	When reddish dark clouds is observed gathering it is an indication of impending rainfall with heavy storms within that day or at night	Used
Limpua	Tree	“Sinsaba”	It is a tree which bears sweet and edible berries	The tree produces sweet, reddish fruits. It normally fruits within the dry season. The ripening of the fruits produced by the tree indicates enough moisture within the soil for planting.	Used
	Tree	“Dawadawa”	It is a big tree that bears long beanlike fruit	This tree begins to fruit at the beginning of the year. The drying up of the fruit of the tree often begins on the month of May. When this happens, it indicates the beginning of the rainy season.	Used
	Black Ants	“Salinsae”	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	Used
	Man	“Saboona”	Spiritual Person within the community who have the power to call rain	This individual is considered to be spiritual and is able to communicate with the spirits. He consults the spirits and request for rain but this depends in the agreement of the Gods and so he need to appropriately prepare. They are also able to stop the rain from falling	Used

	Wind	“Puahim”	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Used
Limpua	Heat	“Tulim”	An abnormal increase of weather temperature	When the temperature is high accompanied with still wind during the day or night it indicates a high chance of rainfall is expected.	Used
	Fog	“Pagli”	Fog is a cloud that occurs at ground level instead of in the sky	When dense fog is observed early in the morning all over the community it indicates rainfall.	Used
	Sun	“Wuntanga”	A yellow looking star at the centre of the solar system	When the sun rises early in the morning so bright and with no clouds in the sky it signals a warm day.	Used
	Clouds	“Sagbana”	Masses of water or ice in the air that looks like white cotton ball	When reddish dark clouds is observed gathering it is an indication of impending rainfall with heavy storms within that day or at night	Used
	Wind	Puahim	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Used

			air.		
Kpalgagbini	gods	Tigban		In a period of drought sacrifices are offered or made to the gods for rainfall.	Used
	Man	“Saboona”	Spiritual Person within the community	This individual is considered to be spiritual and is able to communicate with the spirits. He consults the spirits and request for rain but this depends on the agreement of the Gods and so he needs to appropriately prepare. They are also able to stop the rain from falling	Used
	Heat	“Tulim”	An abnormal increase of weather temperature	When the temperature is high accompanied with still wind during the day or night it indicates a high chance of rainfall is expected.	Used



















	Black Ants	“Salinsaa”	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	Used
	Toad	“Pololi” “Lipotri”	Similar to frog: a small squat tailless amphibian distributed nearly worldwide. Has dry warty skin and, lives mostly on land.	When more than one toad croaking at night in an usual way then it is a signal that rainfall is expected within 24 hours	
	Wind	“Puahim”	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Used
	Sun	“Wuntanga”	A yellow looking star at the centre of the solar system	When the sun rises early in the morning so bright and with no clouds in the sky it signals a warm day.	Used
Zang	Baobab tree	“Toa”	This is a big tree with a large trunk that is mostly found in the north.	The Baobab tree sheds off its leaves during the dryseason. When the tree begins sprouting new leaves it is an indication that the rainy season is close.	Used
	Diseases/Illness Rhematism	“Darimihi”		People with this disease are able to predict a rainfall. Before a rainfall, they feel a type of sensation in the joints and this sensation can be used to predict a rainfall.	Used
	Rainbow	“Sagani”		This normally occurs in the sky before or after a rainfall. During a period of drought when a rainbow is seen it signifies rainfall. Also when the rainbow is seen immediately after a rainfall it indicates a period of drought.	Used
	Black Ants	“Salinsaa”	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	Used



	Fog	“Pagli”	Fog is a cloud that occurs at ground level instead of in the sky	When dense fog is observed early in the morning all over the community it indicates rainfall.	Used
	Sun	“Wuntanga”	A yellow looking star at the centre of the solar system	When the sun rises early in the morning so bright and with no clouds in the sky it signals a warm day.	Used
	Clouds	“Sagbana”	Masses of water or ice in the air that looks like white cotton ball	When reddish dark clouds is observed gathering it is an indication of impending rainfall with heavy storms within that day or at night	Used
	Wind	Puahim	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Used
Bini	Wind	“Puahim”	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Used
	Mosquitoes	“Duunsi”	A family of small, midge-like flies: the Culicidae. Which are a nuisance to human because they consume blood from living vertebrates	When there is a more than average heat with the presence of numerous mosquito bites at night it is a sign of rainfall	Used
	Baobab tree	“Toa”	This is big tree with a large trunk.	The Baobab tree sheds its leaves during the dry season. When the tree begins sprouting new leaves it is an indication that the rainy season.	Used
	Shea		It is a wild tree that has a gestation period of 20 years. Its nuts are brownish in nature and often used for	The shea tree flowers in the early month of the year. When it starts flowering it indicates the rainy season will begin in the next two months.	
			Sheabutter.		
	Rainbow	“Sagani”	An optical and meteorological phenomenon that is caused by both reflection and refraction of light in water droplets in the Earth's atmosphere reflecting strips of different colours in the sky	This normally occurs in the sky before or after a rainfall. During a period of drought when a rainbow is seen it signifies rainfall. Also when the rainbow is seen immediately after a rainfall it indicates a period of drought.	Used

	Black Ants	“Salinsahi”	They are smallish and black, their eggs are white. They do not carry their egg far away; when it is about to rain they just change their position	If sighted carrying their eggs, and changing their position during the rainy season then it will rain that day or the following day.	Used
	Dew		Dew is water in the form of droplets that appears on thin, exposed objects in the morning or evening due to condensation.	The falling of dew can be used to indicate rainfall. When dew is observed in the morning it means there will be no immediate rain.	
	Fog	“Pagli”	Fog is a cloud that occurs at ground level instead of in the sky	When dense fog is observed early in the morning all over the community it indicates rainfall.	Used
	Sun	“Wuntanga”	A yellow looking star at the centre of the solar system	When the sun rises early in the morning so bright and with no clouds in the sky it signals a warm day.	Used
	Clouds	“Sagbana”	Masses of water or ice in the air that looks like white cotton ball	An indication of impending rainfall with heavy storms within that day when clouds are observed to be very thick and reddish gathering at the Eastern part.	Used
	Wind	Puahim	Wind is the flow of gases on a large scale. On the surface of the Earth, wind consists of the bulk movement of air.	When it blows from West to East it signifies that there is going to be rainfall within the rainy season.	Used

**Table 2: Pictures of Some Selected Indicators**

					
<i>Toads</i>	<i>Black Ants</i>	<i>Termites</i>	<i>Army Worms</i>	<i>Earth Worms</i>	<i>Snails</i>
					
<i>Tortoise</i>	<i>Crickets</i>	<i>Butterflies</i>	<i>Cattle Egrets</i>	<i>Baobab</i>	<i>Dawadawa</i>
					
<i>Shea</i>	<i>Tamarind</i>	<i>Red Berries</i>	<i>Acacia</i>	<i>gods</i>	<i>Dew</i>

### 3. Observations / Analysis

- ✓ Indigenous weather indicators are the fabric of communities which they depend greatly on for weather information
- ✓ Both men and women use the same indicators for forecasting and for different planning activities. Whereas women focused on household and income activities such as fetching of water, picking of sheanuts, drying of food stuff men focused on construction and renovation of houses, outbreak of livestock disease, cropping and others. Children were also observed to be interested in when to gather fuel wood, shepherding, fetching water and school attendance.
- ✓ Indigenous plants and animals used for prediction are getting extinct due to population growth and deforestation making prediction difficult.
- ✓ Though communities use indigenous methods for weather forecasting, they strongly believe the reality of their prediction depends on God.
- ✓ Lack of documentation in the era of global modernisation is eroding the relevance and reliability of these indigenous indicators.
- ✓ There is no scientific explanation to some of the indicators used by communities
- ✓ There are cross cutting indicators in all the 18 communities that could be documented for communities use

### 4. Recommendation

- ✓ There is the need to preserve the natural environment by promoting the planting of indigenous plant species as well as animals to sustain the natural eco system while enhancing the environment.
  - ✓ Indigenous knowledge should be appropriately documented in a way that men, women and children irrespective of illiteracy level can use to complement science-based forecasting.
  - ✓ LINK Ghana project will develop key cross cutting indicators into gender sensitive and user friendly calendars that can be used by community members.
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