FACTORS DETERMINING PEOPLE'S ACCESS TO COMMON POOL RESOURCES:
The Case of A Community Dam Irrigation Farming in Binduri in The Bawku Municipality Of Ghana.

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ABSTRACT

As the demand for water keeps on rising over its supply, many governments, organisations and communities continue to devise ways and means of coping with the pressure arising from the high demand. At the community level, this is reflected in the management of common pool resources. The determination of access forms an essential part of community common pool resource management. Three qualitative data collection tools; focus group discussion, observation and mapping, were used to collect data for this particular analysis. The study reveals that land and water are the most important natural capital assets of the community. The demand placed on these resources, especially water, for irrigation farming is introducing an element of competition resulting in insecure access to the water by an increasing number of people. Despite the high demand for water for irrigation farming, the people have relied on community institutions that operate outside the market system in the allocation of user rights or determination of access to this scarce resource.

KEY WORDS: Common Pool Resources, Institutions, Resource Ownership, Access to water, and Irrigation Farming.

INTRODUCTION

The Binduri dam was constructed in 1960. Located in the Sudan Savanna belt in Northern Ghana, the area experiences harsh climatic conditions including erratic rainfall pattern, long dry season, and land degradation among other things. The development of water, in the form of the construction and rehabilitation of dams and dugouts to collect water during the rainy season for irrigation farming in the dry season has become an important intervention, aimed at improving the livelihoods of the people in the Binduri area.

The development of water resources in the form of dam construction to facilitate the harvesting of rain water for use during the long dry season has become an important livelihood strategy to the people of Binduri. Among the many uses of the dam water, irrigation farming is a leading user activity. In terms of income generation, the use of

the dam for dry season farming is widely perceived as the most important income generating activity of the people of Binduri. The dam is currently ranked as the most important economic asset in the community in terms of its contribution to the livelihood scheme of the people.

Another important aspect of this resource, especially with regards to its management is the perception on the ownership of this resource. The dam is perceived as a property of government, or community or belonging to the chief/'tindana'. In line with this perception, the dam is a common property resource which is available to everybody in the community. To them, anything belonging to the government, community or the chief/'tindana' is devoid of individual monopoly and is to be made available to all. This perception influences the management of the dam, especially in the definition or determination of access. The paper identifies the users and uses of the dam and then proceeds to look at the factors that influence people's access to this common pool resource. This is preceded by analysis of theoretical framework.

CONCEPTUAL FRAMEWORK

Common Pool Resources and Property Regimes

Natural resources have been categorised into a number of property regimes, including common property, state or public property, private property and at times open access. Common property or common pool resources have received the attention of many scholars, such as Hardin Garret, Elinor Ostrom, Shepherd, Ellis, Upton, Toulmin and Quan, and so on. Most of these scholars focus on institutional arrangements under which resources are managed. Ostrom (1990) defines common property resource as natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use. What is important in this definition is the right of usage that is often conferred to a well defined social group. Common property is a resource system that is being used simultaneously by a specific social group or groups of people within a defined geographical area.

One essential feature of common pool resources is the conferment of user right to a particular group of people. Bromley (1992) notes that in common property arrangement, a limited set of individuals has use rights, but ownership is in some sense vested in the group, which thus acquires the power to regulate the commons and to exclude others. On his part, Ostrom (1990) notes that access to a common pool resource can be limited to a single individual or firm or to multiple individuals or teams of individuals who use the resource system at the same time. Toulmin and Quan (2000) note that a fundamental feature of all property regimes including common property is the possibility of excluding those without property rights. Common (1995) also observes that, "the way in which producers and consumers use natural resources depends on the underlying set of property rights – a bundle of entitlements

that convey to the owner certain privileges and constraints." All these authors confirm the fact that there is right of usage to a particular resource that is being held under a common pool/property resource regime. Access to a common pool resource is thus limited to that socially or geographically defined group that has the right to appropriate the resource. Under this property regime, people outside this socially or geographically defined group can be excluded from the use of the resource in question. This distinguishes resources held under common property regime from those held under the open access, state and private property regimes.

Access to natural resources is determined by the property regime under which a particular resource is held. According to Ellis (1993), the existence of property rights over a commodity or service permits the holder of those rights to exclude others from their use, control their access, or charge a market price for their use. Feeny, Berkes,McCay and Acheson, (1990) and Ellis (1993) identify four main categories of property rights with differing implications for the management of natural resources. These are private property, state property, common property, and open access. Ellis, (1993) notes that with the exception of the last of these, each type of property involves the three attributes of rights, authority and duties. These authors also recognise the existence of institutions that confer user rights on people as the distinguishing factor between common pool resources and others held under different property regimes.

The existence of appropriate institutions that clearly defines access and rules in the use of resources constitutes the key pillars in the utilisation and management of community resources. It is clear from the observations made by Ellis that in the absence of such institutions, the sustenance of resources is at a balance since their use can not be monitored and regulated. This study basically seeks to find out how these factors interplay to either enhance or deny people access to land and water for irrigation farming in the Binduri area.

Water for Irrigation

Water remains one of the most important natural resource in the life of people. In fact, almost every human activity requires the use of water. Its access is thus critical in the life of every individual or society. In the view of Fisher and Ponniah (2003), water is a fundamental resource for life and is thus the common heritage of all. Therefore, it can not be privatised or converted into a tradable commodity. The right to water is an inalienable social, economic and human right. Fisher and Ponniah are advocating the right of every individual to water. The question to ask here is whether water can be made available to all individuals at this material moment. Again, is it possible for everybody to have access to water for all purposes? Water is undoubtedly becoming a scarce commodity, because its increasing demand and usage is not matched with increases in natural supply. Miller (1988) observed that between 1940 and 1984, total water withdrawals in the world increased fourfold and average with-

drawal per person doubled. According to him, almost three-fourths of the water withdrawn each year throughout the world is used for irrigation.

In their study of thirteen of Kajiado District's sixteen small-scale, farmer- managed irrigation schemes, Woodhouse, Bernstein and Hulme, (2000) observe that both irrigable land and water have become valuable commodities. They note that with increasing numbers of irrigators and decreasing per capita water supply, claims on rights to irrigation water have multiplied rapidly. They further observe that those leasing out land often demand separate payment for the lease of their water share. On his part, Shepherd (1998) observes that structural adjustment programmes call for a greater reliance on markets, competition and phase-out subsidies. They promote the idea that water is a good in limited supply and therefore an economic (or toll) good, no longer a free good, to which everybody has a right.

The observations made by Woodhouse et al, (2000) and Shepherd (1998) point to the increasing commercialization or commoditization of water which was once perceived as a free gift of nature available to all. The growing demand imposed on water continues to increase its market value and this has resulted in increased calls for the use of the market system in allocating water among competing uses and users. As noted by Yoskowitz (1999), water markets have become increasingly popular with water managers and state officials as a means of allocating or reallocating this resource. However, Rees (1990) notes that rarely have managers of common property resources set out to use the price mechanism as an allocative and demand control devise. It is evident that though the market system is one of the means of allocating water among competing users and uses, it is often not the preferred system for the poor masses. Commercialization or commoditization of water has the potential of denying the poor in society access to water, even for domestic uses. Access and/or lack of access to the commons have implications to households' livelihood. As noted by Woodhouse et al, (2000), losers in the contest to access resources are often caught within a poverty trap. This is a situation that civil society organisations, especially right-based organisations want to avoid by stepping up campaigns against water privatization. This also calls for the strengthening of community institutions to effectively manage such vital resources for the common good of all.

METHODOLOGY

The information for this article is obtained from a wider research that was conducted in Binduri, Bawku on the management of common pool resources. The main response group of this study was the water users. They constitute the principal actors around which the use and management of water revolves. The study made use of three qualitative data collection tools, focus group discussion, observation and mapping. For the purpose of focus group discussions, the unit of analysis was grouped into seven strata (Block A, Block B, Asimiik Bulug, Asadyok, Akorookoni, Past Water Users Association Officers and Present Water Users Association Officers)

according to their location and/or functions they perform with respect to the dam. Asimiik Bulug, Asadyok and Akorookoni are found in the dam catchment's area. They all however differ in historical and organizational outlook. Table I below presents the strata and the number of participants for the focus group discussion in each stratum.

Table I: Strata for Focus Group Discussions

Strata	Number of Participants
Block A	12
Block B	10
Asimiik Bulug	11
Akorookoni	7
Asadyok	6
Old WUA Officers	6
New WUA Officers	7

Source: Field Study, March, 2006.

The use of stratified sampling technique was motivated by the desire to have smaller groups included in the sampling frame. This is in line with the observation of Mugenda and Mugenda (1999), that the obvious advantage in stratified random sampling is that it ensures inclusion in the sample of sub-groups which otherwise would be omitted entirely by other sampling methods because of their small numbers in the population.

The main aim of all these focus group discussions was to obtain in-depth information on concepts, perceptions and ideas of the different groups pertaining to access and the use of the dam. The groups and participants were of the same socio-economic status or of a similar background in relation to the issues investigated. For instance, they were either users within the scheme who have fair access to the water for their farms, or users within the scheme who have less access to the water for the farms; or past or present officers of the Water Users Association (WUA); or better still, farmers located at the dam's catchment area whose activities adversely affect the dam.

Activities at the irrigable area were also observed. The researcher was particularly interested in observing the layout of the site and the flow of water through the canal into the various plots and how farmers use the water at their respective plots. Observation became a very important technique for data collection for this particular study as most of the activities were better observed at first hand than using other tools to collect data on them. Observation enriched the other data collection techniques especially the focus group discussions as it helped the researcher to probe into certain activities he had observed. The observation also put the researcher in a better position

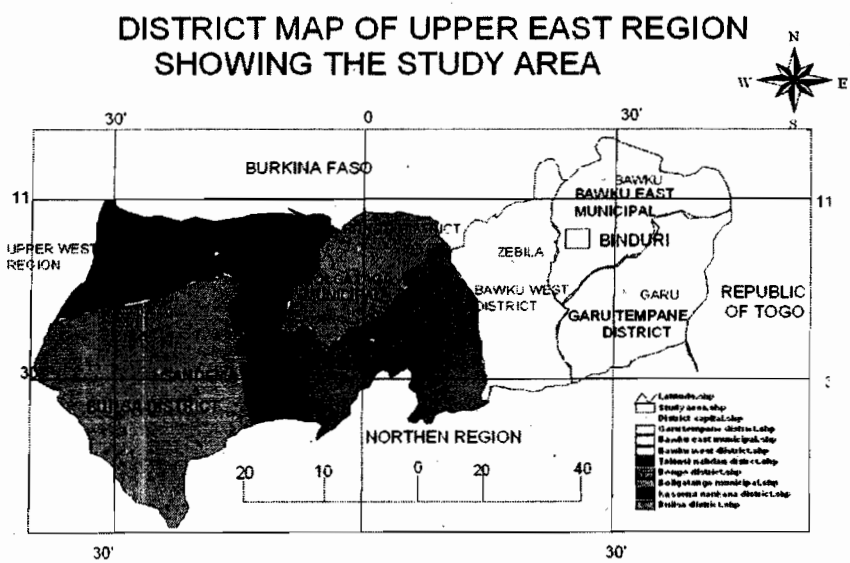
to explain what exist and to make predictions for the near future.

Mapping was another technique used to collect data for this exercise. The researcher was interested in mapping the area that was served by the dam and the catchment area of the dam. The existing site plan of the irrigable area of the dam was also taken to the site and mapped into full access and less access zones to facilitate an in-depth analysis of what is happening on the ground. This technique helped the researcher to establish and highlight certain relationships that hitherto were not recognized; especially the distance – access relationship regarding the use of the irrigation water.

RESULTS AND DISCUSSION

Binduri is situated in the North-West of the Municipal capital, Bawku which is located approximately between latitudes 11o 10' and 10o 40' N and longitudes 0o18'W and 0o 06'E in the northeastern corner of the Upper East Region of Ghana.

Fig. I: Location of Study Area in the Regional Context



Source: Author's Construct, 2006

The Binduri area occupies a large portion of the Bawku Municipality. Binduri is one of the three constituencies in the Bawku Municipality. It shares boundaries with the Bawku Central Constituency, the Garu-Tempane Constituency and the Bawku West Constituency.

Water Users and Uses

The study identified four interwoven categories of water users in the Binduri Community. They include irrigation farmers, livestock farmers, fishermen and pito brewers. All these users have varying perceptions and interests in the use of the water. During focus group discussion, the livestock farmers indicated that they want water to be available in the reservoir/dam for their livestock. They explained that without water in the dam, their livestock would die especially during the long dry season. Their fear was that the water would be used up for irrigation farming at the expense of the watering of livestock.

The pito brewers also stated during the focus group discussion that they do not only want water in the reservoir, but want it in such an amount that will still keep it clean and safe for pito brewing. They observed that when the water level in the reservoir is too low, it often becomes dirty for use. During such periods, they are often compelled to move to distant boreholes and wells which have cost implications to them.

The interest of the fishermen as expressed during the focus group discussion is the most varied among all. The fishermen get much harvest when the water level in the reservoir is low. They however expressed their fear that such situations can easily lead to unsustainable harvests, as the stock could quickly be depleted within a short period of time. Though they gain irrespective of the level of water in the dam, they expressed fear that the complete drying up of the dam is likely, and this would keep them out of job.

Irrigation farmers also indicated during the focus group discussion that they want to have enough water in the dam for their gardening. Though the activities of the livestock farmers and pito brewers do not adversely affect the quantity of water available in the reservoir for farming purposes, the opposite is the case with irrigation farming. Irrigation farming involves the daily release of water from the reservoir through an outlet to the canals for onwards distributions to the various plots. This drastically reduces the amount of water in the reservoir at every point in time.

In terms of access, all the above user groups have access to the water. It was established during the focus group discussion that even the livestock farmers, pito brewers and fishermen who reside beyond the 11/2km service zone of the dam have access to the community dam for these purposes. On the part of irrigation farming however, it was established during the focus group discussion that access to the dam is only limited to those located within the 11/2km radius service zone of the dam. This means that in terms of irrigation farming, the boundary or access zone is clearly defined. This is to say that there is restricted access for uses that are of high economic value or that bring in higher economic returns in that particular location. Despite the impact of irrigation farming on the level of water in the reservoir, it remains the most preferred use of the water.

Interestingly, it was established during the focus group discussions that competition and conflict among the various categories of users stated above is almost non-existent because nearly all the other user groups are irrigation farmers at the same time. What exists now is not a rivalry among the different categories of users, but a competition among potential irrigation farmers for access to land in the irrigable area of the dam to participate in the dry season onion farming. There is also competition among the existing irrigation farmers for equitable or fair access to water for their respective farmlands/plots. The preference for irrigation farming is viewed in relation to its contribution to household food security and income. The various users indicated during the focus group discussion that irrigation farming is currently the life-saving wire of the people in the Binduri area. Income obtained from the sale of onions is used to purchase foodstuff to supplement what is often gotten from rainy season farming and to solve other household problems.

Factors Influencing Access

Land Ownership and Access to Water

One other important factor that influences people's access to water for irrigation farming is the pattern of land ownership in the community. Land in the community is own by individuals. The people initially agreed to put the irrigable area under the control of the Water Users Association for the common good of all. On the basis of this, the Binduri Water Users Association developed a criterion and distributed the land at the irrigable area of the dam among the potential users. The Water Users Association also acknowledged people whose lands have been used for the scheme in the distribution of the plots at the irrigable area. Land owners at the irrigable area and the catchment area of the dam were first identified and allocated plots in the irrigable area. This arrangement by the Binduri Water Users Association is in line with what is known as the theory of 'Riparian Water Rights'. Riparian Water Rights grant owners of land bounded by a river, stream or natural body of water the right to reasonable use of the water including irrigation, as long as the user shows regard for the equal water rights of others comparably located (Knutson et al, 1983).

However, despite the recognition given to the land owners, they continue to conduct themselves in a manner that affect access and the use of the dam and the irrigable lands by others, like the frequent seizure of land by such land owners and the refusal of some farmers to relocate their farming activities from the dam's catchment area. This makes its difficult for the Water Users Association to effectively guarantee access to other potential users who do not own land in the irrigable area. Dunkerley (1983) observed that institutions for defining the rights of ownership and use of land (tenure) have been a concern of every organized human society and have frequently been interwoven with fundamental social structure and religious belief. He noted that in all socio-economic classes in all countries, land tenure touches deep emotions. The recognition of dry season onion production as the most productive and rewarding

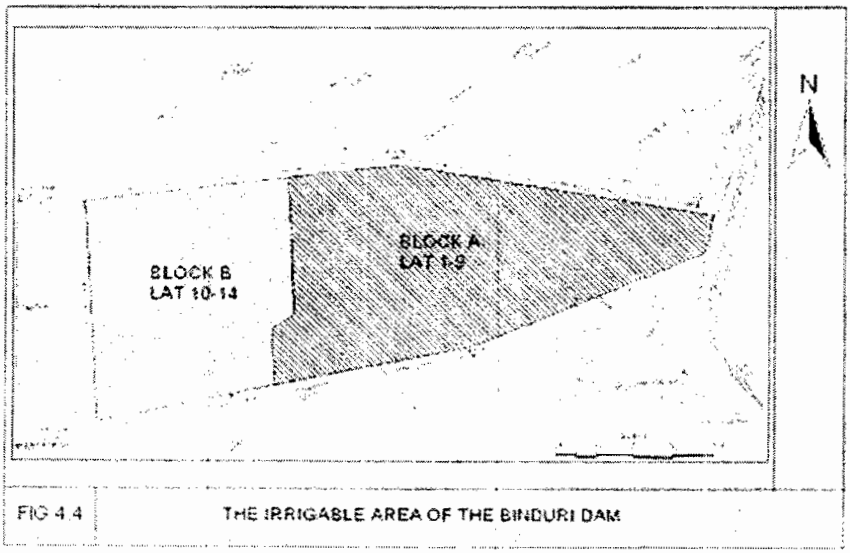
economic activity has brought about high demand for water and land at the irrigable area of the dam for dry season irrigation farming. Access to the dam water for irrigation farming is tied to access to land at the dam irrigable area. Farmers who could not obtain land within the dam's irrigable area are automatically out of access.

Physical Location

The physical location of the farmer is critical in determining his access to the dam for irrigation farming. The focus group discussion and the mapping technique revealed that distance or physical location influences access to the Binduri Dam water in two different ways. In terms of irrigation farming, access to the water is limited to people living in a defined geographical area. It was revealed during the focus group discussion that, only farmers living within 11/2km radius to the dam are considered potential users of the dam for irrigation farming. This means that farmers who reside outside this range can not have access to the dam water for irrigation farming. However, as stated earlier, people outside this range can have access to the water for other uses such as watering of animals and domestic chores, but not for irrigation farming.

1. Pito is a local alcoholic drink prepared from guinea corn.
2. A lateral refers the sideways or tracks that are demarcated into plots and beds.
3. Tindana is the traditional priest who acts as custodian of land in the community.

Fig II: A sketch Map of Irrigable Area



Source: Irrigation Development Authority (1993).

Similarly, the farmers who currently use the dam for irrigation farming (i.e. farmers within the 11/2km radius) also have varying degrees of access as a result of distance or location with respect to the water point as illustrated in Figure I above. It was established during the site visits and mapping that farmers beyond lateral 9 in the scheme or irrigable area do not have easy and/or regular access to water for their farms. It was also observed that when many farmers near the water point decide to connect water to their farms, the amount of water in the main canal gradually reduces in volume, thus rendering the distant farmers lesser and lesser access. As long as those near the water point stay and use water at their respective farms, the distant farmers will continue to have less water at that particular period of time. This phenomenon of inequitable degree of access to water by the irrigation farmers was identified as one of the main sources of conflict among the water users.

Availability of Water for Irrigation

The amount of water collected in the dam determines the uses that it can support and the extent to which it can support such uses. Water for various uses is increasingly becoming a problem in most parts of the world, especially in the arid and semi-arid parts of the world. Miller (1988) observes that at least eighty (80) arid and semi-arid countries, accounting for nearly 40% of the world's population now experience serious periodic droughts and have considerable difficulty in growing enough food to support their populations.

The amount of water that can be collected for irrigation farming at a particular point in time is in turn determined by the intensity and duration of rainfall as well as the capacity of the dam to hold such water. The dam has a reservoir of 680m long, a dam crest elevation of 212.5m and a storage capacity of 46ha-m. The existing storage capacity is far from being adequate for the community which has a very large number of potential irrigation farmers. During the focus group discussions, they people stated that the amount of water in the dam has been reducing by years. They attributed this phenomenon to siltation and decreasing amount of rainfall in the area. In such a situation, measures have to be put in place to allocate the water to the competing users. Rees (1990) observes that concentration on distribution stems from the belief that all resource problems basically arise from conflict over the ways resources, or the welfare derived from them are allocated between groups over time and space. She notes that the explanations are not simple and must involve an understanding of physical systems, economic processes, social organisation, legal administrative structures, and political institutions. As noted by Tang (1991), allocation rules are needed to regulate use since supply is limited. The institution of such measures is very critical in the determination of access because it is the daily distribution of water that determines the quantity of water that a farmer can channel into his plot.

Currently, the size and the water holding capacity of the dam affect access in two different ways. First, the limited amount of water in the reservoir places a limit on the

size or amount of land that can be put under cultivation. Though land for irrigation farming is in abundance, the limited amount of water has only made it possible for the cultivation of 17 hectares of land. This limited amount of irrigable land imposed by the limited amount of water also places a limit on the number of people who can have access to the irrigable land. Secondly, the limited amount of water also affects the period or length of cultivation. Though the farmers during the focus group discussion expressed interest in cultivating various kinds of vegetables throughout the entire eight months dry season, the limited amount of water in the dam has restricted their length of cultivation to a maximum of three months. This means that from March when they harvest their onions to June when the rains are expected to set in, all farmers in the community have no access to water for irrigation farming. The limited amount of water thus limits both the size of the cultivable area and the length or duration of cultivation.

Community Institutions

The community constitutes the core stakeholder group in the management of the dam. The focus group discussion reveals that access to the dam water and its related assets like land is largely influenced by the actions of such community institutions as the Water Users Association, the Tindana and the Assembly Person. According to Woodhouse et al (2000), a complex web of institutions – 'customary', induced community organisations, local state, national state and private sector – are involved in determining who has access to the area's resources, how they are utilized and how use is co-ordinated and regulated (or not). With respect to common pool resources, it is the interaction between and/or among a network of institutions that defines access and also provides the framework for the resolution of conflicts. The Binduri community dam is governed by a set of institutions, including the Water Users Association, the tindana and the Assembly Person among others.

The focus group discussion reveals that the Binduri Water Users Association is responsible for the day – to – day management of the community dam, including the allocation of plots to potential farmers and the daily distribution of water from the dam. The Tindana and the Assembly Person represent key pillars in the decision making machinery of the community. These two institutions have played important roles in the management of the dam. As the custodian of the community land and 'link person' between the people and the earth god, the Tindana represents the people in all matters relating to land. It was established during the focus group discussion that it was the Tindana who signed the agreement with the Bawku Municipal Assembly releasing the land at irrigable area of the dam to the Water Users Association for irrigation activities. It was also established during the focus group discussion that the Assembly Person for the Binduri Electoral Area has always played key roles in the resolution of conflict arising from the use of the scheme. These institutions define the degree of access and provide the framework for use and management of the resource as well as the resolution of conflicts. They are the social structures and social mecha-

nisms that make and enforce rules aimed at governing individuals and society in the use of the community dam.

CONCLUSION

Water is perceived as a non-excludable resource that should be available to all residents of the community. Contrary to this thinking, the study reveals that access to the water especially for irrigation farming is not fully guaranteed to all, as it is being restricted to a particular of people.

The perception and use of a resource at any point in time defines its access zone or boundaries of use. The definition of boundaries is very essential in access management. It has being established through the focus group discussion that the economic use or value of a particular common pool resource defines its access zone. For instance, the focus group discussion reveals that access to the dam water for various uses other than irrigation farming is almost free to users within and outside what is termed as the access zone. However, for uses of high economic value, access is limited to a particular core group of users. It is discernable from the analysis above that the higher the economic value of the common pool resource, the narrower the access zone and vice versa. For instance, in a situation where the people perceive such a resource as bedrock of their livelihood, they are more likely to have deep emotional attachment to it.

In situations of this sort, it takes time tested institutions to be able to manage such resources, particularly in the determination of access and the enforcement of user rights. There is also the need to regulate the activities of farmers in the catchment area of the dam to minimize the rate of siltation currently place in the dam. Furthermore, the activities of land owners need to be regulated to avoid the rampant seizure of land.

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