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Analysis of Livestock Production Potentials and Strategic Constraints of Dila Zuria District

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Abstract

Dila Zuria district is one of the 7 districts of gedeo zone and known for its agricultural production in the zone. There are lots of crop types produced, livestock raised and various natural resource available in this district although various factors of production and productivity were hindering development of the sector. Therefore, this study was conducted to identify and document the recurrent production potential and constraints in livestock sector so as to base research and development works on the output. To achieve these objectives, checklists were prepared; two sample Kebeles, focus group discussion (FGD) participants and key informants were purposively selected, interviewed and discussion were conducted. Secondary data were also collected from Districts and selected Kebeles. The result indicated that the district is endowed with livestock resources such as cattle, sheep, goat, poultry, honeybee, fish and equines. Availability of improved livestock breeds and feeds, improved bull and AI services, practices of fishery and fish production, and use of modern bee technologies were identified as potentials and opportunities of livestock production and productivity in the Dila Zuria district. Whereas, Prevalence of diseases such as black leg, trypanosomosis, FMD, and bovine and ovine pasteuorolosis; shortage of improved breed, shortage of feed in quantity and quality, lack of market information, shortage of technology supply; decreasing of the traditional grazing lands; lack of awareness on modern animal production; market linkage and infrastructure problems were identified as major constraints of livestock production and productivity. Therefore, researches, demonstrations and trainings on livestock disease and parasites management; breed improvement; on improved forages/floras and their quality; Researches on marketing and value chain of livestock commodities; Researches on adoption of livestock inputs and other technologies; and trainings and researches on modern animal production system were among recommended interventions to minimize these constraints and boost livestock production and productivity.

Keywords: Dila Zuria, Livestock, Potentials, Constraints

1. Introduction

Livestock is one of the dominant agricultural sectors where the economy of Ethiopia is based on and the country earns foreign currency. Ethiopia is first in Africa and tenth in the world in livestock population although lots of natural and human made catastrophes were holding back the development of the sector in terms of quality and quantity. The total estimated livestock species and their number include 65 million cattle, 40 million sheep, 51 million goats, 8 million camels and 49 million chickens as per the 2020 statistical abstracts of central Statistical Agency (CSA, 2020 cited in Management Entity, (2021) [4]. It had been an integral part of crop production since the advent of agriculture in Ethiopia. The livestock sector in Ethiopia is estimated to account for 18% of the GDP; provides employment to over 30% of the agricultural labor force; and produces 40% of the income the country generates from the agricultural sector (Aleme & Lemma, 2015) [1]. Therefore, it is believed that developing this sector is crucial to boost national economy at one hand and the livelihood of smallholder farmers on the other hand (Shapiro, *et al*., 2017) [5]. In this regard, Dila zuria district is known for its high production of livestock in Gedeo zone of SNNPR of Ethiopia. Almost all domestic animals are being reared in the district even though various challenges have been testing the sector not to escalate to the expected level. Therefore, assessing and properly quantifying those production potentials and strategic constraints, and working on them had been crucial to enhance production and productivity of the sector. Doing that is believed to enable identify those major bottlenecks of livestock production that can be basis for research and development works, and enables use of limited resources efficiently. Therefore, this study was conducted to identify and

document the recurrent production potential and constraints in livestock sector so as to base research and development works on the output.

2. Research methodology

Two Kebeles of Dila zuria district were selected based on livestock production and productivity potential by the district's agriculture office experts, which were believed to represent the production potentials and constraints of the district well. The Kebeles were Chichu and Otilcho. One FGD per each Kebele consisting of 8 participants were formed, and discussions were conducted based on the FGD guiding questionnaires and checklists. The participants were from various social strata including model farmers, kebele administration representatives, Elders, women and youth. In addition, key informants were purposively selected, interviewed and discussion were conducted using checklists. Secondary data were also taken from Kebele repositories. Finally, the data were analyzed using descriptive statistics and priorities of the identified problems were ranked using pair wise ranking method

3. Results and discussion

3.1 Description of the study district

Dila Zuria district is one of the 7 districts of Gedeo zone. It is located at the southern part of Gedeo zone. Agro-ecologically, most part of the district is categorized as Woynadega (midland). Few parts of the district were categorized under lowland. Two representative sample kebeles namely Chichu and Otilcho were selected from Dila Zuria district to understand the production potentials and constraints of agricultural production and productivity of the district. The mean land holding of the district is 0.5ha with minim of 0.125 and maximum of 1ha. The district production system is crop dominant. Astronomically, the district is located at 6°24′30″ North latitude and 38°18′30″ East longitude. The altitude of the district is 1570 masl.

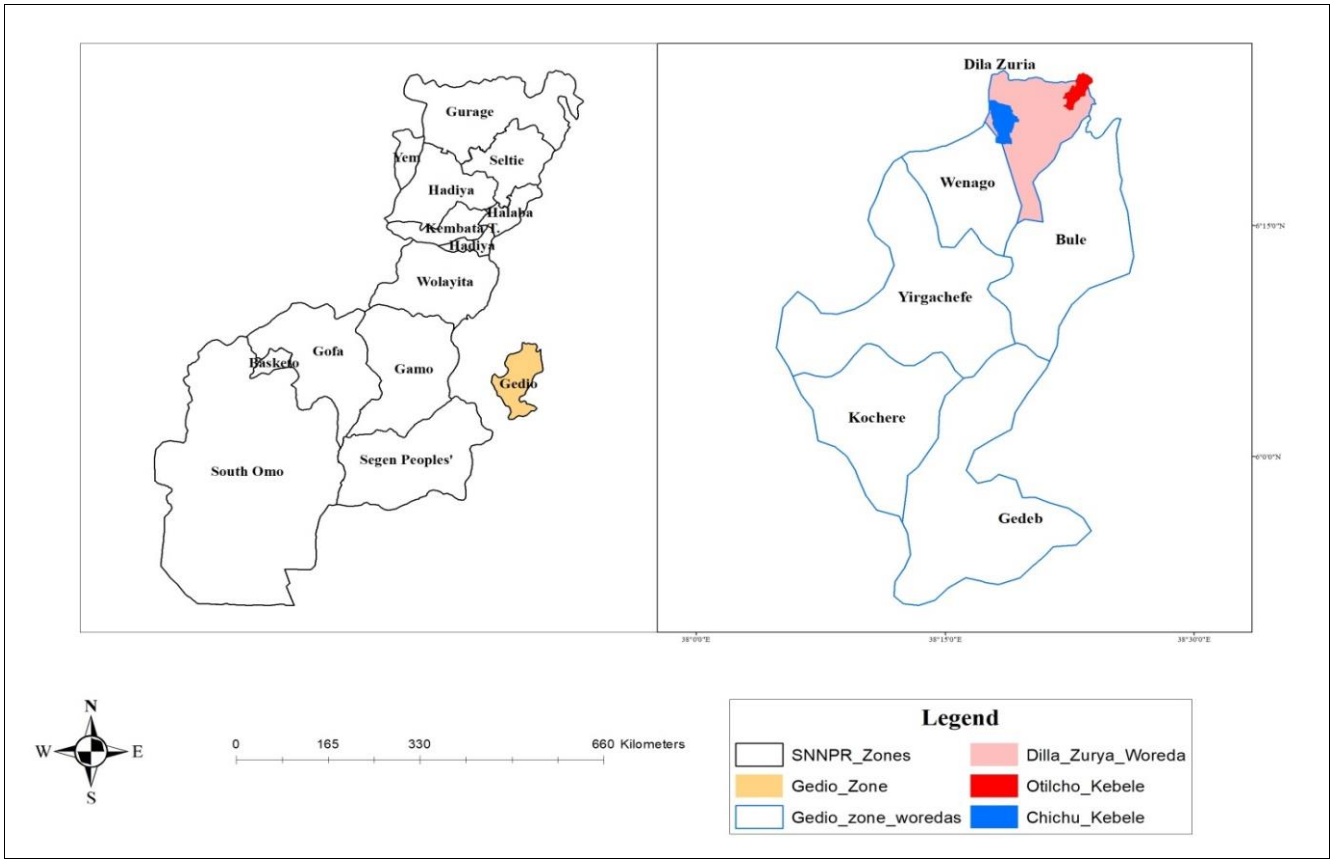

Fig 1: Map of Dila Zuria District and sample kebeles

3.2 Livestock Production and Management of Dila Zuria District

3.2.1 Livestock species reared in Dilla Zuria district

Dilla Zuria is one of the *district in* Gedeo Zone, was selected for this study. Livestock production is secondary to crop production in Gedeo zone. Farmers keep all the livestock types. Livestock species reared in Dilla Zuria district are cattle, sheep, goat, poultry, fish, honeybee and equine. The main livestock products produced in the area are milk and milk product, meat, skin and hide, egg and honey.

3.2.2 Purpose of rearing livestock

The main purposes of rearing livestock in Dila zuria district were consumption, and sale of live animals as well as consumption and sale of their products such as milk, meat, egg, honey, hide and skin, draught power for Ploughing and transportation, and manure production

3.2.3 Livestock species and performance

According to group discussant, dairy cattle reared in Dilla Zuria district are both improved and local breed. The source of improved dairy cattle breed in the district was from extension. The source of local cattle breed is from own production and market. The average milk yield/day/head is 0.5 to 3 and 4 to 6 liters/day/head for local and improved breed, respectively. The age of improved breed at puberty is 3 to 4 years. The age of local breed at puberty is 4 to 5

years. The calving interval for both improved and local breed is 1 to 1.5 years and 1 to 2 years, respectively. The duration of improved dairy breed entry in Dilla Zuria was before 10 years ago. According to farmers, beef reared in the area are improved and local. The source of improved beef in the district is from AI service provided by government. The source of local beef breed is from the inheritance from own production and market. Sheep breed reared in the area are improved as well as local. The goat species reared in the area are local breed. The source of improved sheep breed reared in the district was from extension. The source of local sheep and goat breed reared in the district is from home and market. According to the interviewed farmers, the age of sexual maturity of improved and local sheep is 6 to 9 months and 12 months, respectively. The age of sexual maturity of local goat is 7 to 8 months. The average lactation length for both improved and local sheep breed is 6 months.

Table 1: Livestock types, source and Productive and reproductive performance

Livestock species	Improved (Yes, No)	Source	Local (Yes, No)	Source	Yield (milk/day, egg/year, honey/year)/head		Productive and reproductive performance						Duration of improved breed entry (year)	
					Local	Improved	Age at puberty (yr)		Calving/clutching Interval		Lactation length			
							Improved	Local	Improved	Local	Improved	Local		
Dairy	Yes	Extension	Yes	Own production and market	0.5 to 3 liter/day/ head	4 to 6 liters/day/head	3 to 4 years	4 to 5 years	1 to 1.5 years	1 to 2 years	10 to 12 months	9 to 12 months	>10 years	
Beef	Yes	Extension	Yes	Own production and market			3 to 4 years	4 to 5 years					10 years	
Sheep	Yes	Extension	Yes	Own production and market			6 to 9 months	12 months	10 to 12 months	12 months	6 months	6 months	7 years	
Goat	No			Own production and market				7 to 8 months		10 months		6 months		
Poultry	Yes	Extension	Yes	Own production and market	300 - 450 egg/year/ hen	600 – 870 egg/year/hen	3 – 4 months	6 to 8 months	1 – 3 days	2 to 3 weeks	----------	-------	>10 years	
Equine	No		Yes	Own production and market										
Honey bee	Yes	Extension	Yes	Own production and market	5 to 10 kg honey/ year/hive	20 – 30 kg of honey/year/hive								

According to FGD participants, increased yield (milk, egg, and meat), and fast growth were Advantage of rearing improved breeds. However, improved breeds do not have only advantages. As per the participants, high feed consumption, disease in-resistance, and difficult management were some of disadvantages of rearing improved breeds.

The participants also identified advantages and disadvantages of rearing local breeds. According to them, advantages of rearing Local breeds were their disease resistance characteristics, low feed consumption and ease of management. Their main disadvantage was low yield (milk, meat, egg).

3.2.4 Inputs Used for livestock production

According to group discussant farmers in the Dilla Zuria district, mating system of animals varies from species to species. All animals are mated by natural mating and in some extent, farmers provided AI service for their cattle from government. According to group discussant farmers, livestock management practices in Dilla Zuria district are based on the traditional knowledge of the farmers and it was noted that the farmers lack adequate knowledge and skills in improved livestock management practices. Free grazing and stalling feeding are the commonly practiced systems of grazing. Feed shortage is also commonly experienced among most farmers. Small land holding of farmers in the area lead to feed shortage as majority of their land is covered by coffee. Group discussant farmers in Dilla Zuria district stated that dairy cattle, small ruminants, equines and chickens are housed in one corner of the family dwelling and their excreta (manure and urine) are cleaned from the house daily. Some farmers, who have iron sheet roofed house, built separate house for their animals. Group discussant farmers in Dilla Zuria stated that farmers water their animals by taking them to the nearby river, which constitute the greater portion, nearer to grazing areas where they travel 10 to 30 minutes.

Table 2: Inputs Used for livestock production

Livestock class	Mating (□)			Feeding (□)		Housing (□)		Health (□)		Water	
	Bull		AI	Free grazing	Stall feeding	Same house	Separate	Traditional	Pharmaceutical	available (yes/no)	Average Distance/wh
	Improved	Local									
Dairy	□	□	□	□	□	□	□	□	□	Yes	10 – 15 min
Goat		□		□	□	□	□	□	□	Yes	10 – 15 min
Sheep	□	□		□	□	□	□	□	□	Yes	10 – 15 min
Poultry	□	□		□		□	□		□	Yes	10 – 15 min
Equines		□		□	□	□	□	□	□	Yes	10 – 15 min

Note= WH=walking hour

3.2.5 Commonly used feed resources

According to the group discussant farmers interviewed, among the most common feed resources, natural pasture and crop residues such as root/tuber, pulse and cereal crop residues contribute the largest source of feed cattle in Dilla Zuria district. Farmers stated that the cultivation of

improved forage crops utilization is Dilla Zuria district is increasing. The major improved grass species farmers currently producing are elephant and desho grass while legume species produced are cowpea and lablab. The farmers in Dilla Zuria district use crop residues for their animals as it is and by chopping it into small pieces. They practice hay making as a major feed conservation technique. The trend of grazing land holding per household is decreasing from time to time. The main reason given for the decrement of land holding in the district is due to increasing population number which results in small land holding size. According to discussant farmers, family land holdings are generally very small and the problem has been exacerbated by the land inheritance system. In Dilla Zuria district, besides, there is no possibility for expanding grazing land due to a high population pressure that induced a transition from land abundance to scarcity. This creates a dire situation to the farmers with respect to livestock production. According to group discussant farmers, bush clearing, fencing, and rotational grazing are the major grazing land management practices.

Table 3: Commonly used feed resources

Livestock class	Natural pasture		Improved forage crops		Supplementary feed				House waste	Crop residues			Dominantly used sources (NP, IF, SF), HW, CR)
	Grazing/ Scavenging	Cut & carry	Grass	Legumes	Concentrate	Wheat bran	Oil crop cakes	Molasses		Root/tuber	Pulse	Cereals	
Dairy	□	□	□	□						□	□	□	NP, CR
Beef	□	□	□	□						□	□	□	NP, CR
Goat	□	□								□	□	□	NP, CR
Sheep	□	□								□	□	□	
Poultry									□			□	NP, HW, CR
Fishery	Poultry litter												Poultry litter

As per the group members, there was no change in the trend of improved forage utilization for the last five years. The main sources of improved forage crops in the study district were non-governmental organizations and extension system. Common produced grass species in order of area coverage were Elephant grass and Desho grass and the common produced legume species in order of area coverage were cowpea and lablab. Chopping and giving crop residues as they were method of crop residues preparation/treating being practiced in the district and hay making is being practices as feed conservation practice.

The trend of grazing land holding per household is decreasing from time to time according to the responses of FGD participants. This was due to population growth which resulted in small land holding size. According to the group, the major constraints of feed sources in the study district include Lack of improved forage development, non-characterization of local available feed sources nutrient content, lack of awareness about feed conservation (haymaking and silage making) for dry /feed shortage season, and decreasing of both grazing land and natural pasture.

Table 4: Common diseases and parasites of livestock species

Diseases Name	Livestock classed affected					Severity season (month)	Rank AC to importance	Locally available measures	Proposed interventions
	Dairy	Goat	Sheep	Poultry	Equine				
Trypanosomiasis	□					January to December	2		Expansion of veterinary service and use of proper animal husbandry
Mastitis	□	□				January to December	7	Cook the root of Mundressa (Gedeuffa.) and drench	Introduction of veterinary services
Pasteuorolosis		□	□				5		Introduction of veterinary services
Blackleg	□	□	□			January to May	3		Introduction of veterinary services
Foot and Mouth Disease	□	□	□				4		Introduction of veterinary services
Anthrax	□	□	□		□	January to February	8	Withholding of water and branding at the left side of the animals at 3rd rib from last rib over the spleen	Vaccination
Brucellosis	□	□	□		□	January to December	11	Draining by surgical incision and then branding	Introduction of veterinary services
Newcastle disease				□		April to May	6	Branding of head, < 50% response	Introduction of veterinary services
Endoparasites	□		□	□		January to	9		Introduction of

						December			veterinary services
Contagious bovine pleuropneumonia (CBPP)	□	□	□			Not seasonal	1		Introduction of veterinary services
Ticks	□	□	□		□	March to September	10	Manual removal	Introduction of veterinary services
Fasciolosis	□	□	□		□	June to September	6		Introduction of veterinary services
Ectoparasites (Lices)	□						13	Tobacco leaves (paste on the skin)	Introduction of veterinary services
Plant toxicity	□	□				February to May	12		

3.2.6 Common diseases and parasites of livestock species

During the focus group discussion, Dilla Zuria district farmers interviewed stated that even though the diseases' out break and their incidence are determined by the level and season. For example; sudden disease outbreaks are prevalent in rainy season as compared to dry season and also sudden death of small ruminant during starting and ending of rain is common. Those factors strictly determine production and productivity of the livestock in the area. The major types of diseases in the area are bovine and ovine pasteuorolosis, contagious bovine pleuropneumonia (CBPP), trypanosomiasis, Blackleg, FMD, Mastits, Anthrax, Brucellosis, Newcastle, internal parasite and External parasites (lice and Ticks). Farmers ranked the top three prevalent diseases as, contagious bovine pleuropneumonia (CBPP), trypanosomiasis and Blackleg. However, in the area vaccination, treatment and other veterinary services are given to the animals by the district and kebele governmental veterinary units but the lack of animal health experts. The veterinary service given to the community is not satisfactory and timely in relation to the total number of animals in the area. Vaccination is rendered only during outbreaks and when diseases are reported. Availability of veterinary service is not enough for all diseased animals (Table 4).

3.2.7 Fish and Apiculture Production

3.2.7.1 Fish Production

According to group discussant farmers interviewed in Dilla Zuria district, there is no natural water potential for fishery but currently they are practicing aquaculture fish production by preparing pond water. A pond water fish rearing practice was introduced by Hawassa Agricultural Research Center. As interviewed group discussant farmers stated that there is lack of awareness on fish production and feeding. The species of fish they are rearing are Nile tilapia. The major feed sources for their fish were pond water leafs and poultry litter. They have no fish trapping equipment. The major constraints of fish production were knowledge gap on fish production, management and feeding; Shortage of feed, Lack of skilled man power, and lack of fish trapping equipment.

3.2.7.2 Apiculture

The group discussant farmers interviewed in Dilla Zuria district stated that there are the practices of apiculture and the hive types used in the area are traditional, Chefeka, transitional and modern beehives. According to the farmers interviewed, the average yield of the traditional, transitional and modern beehive in the area is 5 to 10, 15 to 20 and 20 to 30 kg/hive/year, respectively. The major feed resources used in the area are natural bee floras. As discussant farmers stated that there were no practices of utilization of improved bee flora technologies. The common diseases, enemies and parasites of honey bee are ants, wax moth, sudden death of bee in colony and predators like '*Shelemetmat*'. The major management methods of ants are smoking, cleaning of the area around the tree the place where beehive is located, and transferring beehive from infested tree to another tree where there is no infestation. According to the interviewed farmers, the major constraints of honey bee production in Dilla Zuria district are lack of modern bee technologies, lack of modern beehives, lack of improved bee forages, lack of awareness, diseases, pests and predators, absconding and swarming, Skill gap on multiplication, queen rearing, wax collection methods & honey product processing

3.2.8 Livestock marketing

According to group discussant farmers of Dilla Zuria districts, common market routes and outlets for live animals and animal products are village, Dilla town, and adjacent towns of Sidama and Oromia regions. As per the discussant farmers in the district, the major market actors were producers, brokers, rural assemblers, Catering service providers, consumers. Interviewed discussant farmers also stated that women participate actively in marketing of livestock products such as selling of raw milk, butter and cheese. Moreover, according to the interviewed group discussant farmers, market infrastructure and information system is very low in the area. Marketing of cattle, sheep and goat generate significant incomes to the farmers in the district. However, they face various marketing constraints. Households selling cattle, sheep and goat are often interfered by brokers. Moreover, lack of market infrastructure, lack of price information and lack of livestock marketing cooperative also the major marketing constraints farmers are facing.

3.2.9 Gender role in livestock production and processing

The role of women in livestock husbandry are calve management, watering, feeding and barn cleaning. The role of women in animal products handling were milking, processing, storage and marketing are the major roles.

3.2.10 Livestock production, management and marketing constraints

According to group discussant farmers, the top four ranked constraints that affect livestock production, management and marketing are poor infrastructure, lack of improved breed, feed shortage and prevalence of diseases and parasites.

Table 5: Livestock Production, management and marketing constraints

Major constraints	IB	AI	FS	DP	PP	Pr	Cr	mkt	LP	Is	ES	Score	Rank	species affected			Proposed interventions
														1st	2nd	3rd	
Lack of Improved breed (IB)	--	IB	IB	DP	IB	IB	IB	IB	IB	IB	Is	8	2	Cattle	sheep	Goat	Crossbreeding of local breed with exotic breed
Inefficient AI		---	FS	DP	AI	AI	Cr	AI	AI	Is	AI	5	5	Cattle	Sheep	Goat	Provision of AI equipment and kits along with the technician at site level
Feed shortage (FS)			---	DP	FS	FS	FS	FS	FS	Is	FS	7	3	Cattle	Sheep	Equines	Multiplication and distribution of improved forage seed
Disease and parasite (DP)				---	DP	DP	Cr	Mkt	DP	Is	ES	6	4	Sheep	Cattle	Goat	Prevention of disease by vaccine and create awareness on disease prevention and control method
Pest and predators (PP)					---	PP	PP	Mkt	LP	Is	PP	3	9	Honey bee	Poultry		Awareness creation on pest and predators control mechanisms
Limited product processing (Pr)						---	Cr	Mkt	Pr	Is	ES	1	11	Honey bee	Cattle		Expansion of product processing through provision of modern product processing equipment
Lack of credit (Cr)							---	Cr	Cr	Is	ES	5	6	Honey bee	Poultry	Cattle	Provision of credit service
Marketing (Mkt)								---	LP	Is	Mkt	4	8	Cattle	Sheep	Goat	Developing marketing infrastructure by enhancing farmers-merchants associations, introduction of investors, transport facilities
Low price (LP)									---	Is	ES	2	10	Cattle	Sheep	Goat	Minimizing the involvement of brokers in marketing processes and delivery of update marketing information
Poor infrastructure (Is)										---	Is	10	1	Cattle	Sheep	Goat	Equipping with infrastructures
Weak extension service (ES)											----	4	7	Cattle	Poultry	Sheep	Strengthening of extension services

4. Conclusion and recommendations

Dila Zuria district is endowed with livestock resources such as cattle, sheep, goat, poultry, honeybee, fish and equines. Availability of improved livestock breeds and feeds, improved bull and AI services, practices of fishery and fish production, and use of modern bee technologies were identified as potentials and opportunities of livestock production and productivity in the Dila Zuria district. Whereas, Prevalence of diseases such as black leg, trypanosomosis, FMD, and bovine and ovine pasteuorolosis; shortage of improved breed, shortage of feed in quantity and quality, lack of market information, shortage of technology supply; decreasing of the traditional grazing lands; lack of awareness on modern animal production; market linkage and infrastructure problems were identified as major constraints of livestock production and productivity.

Therefore, researches, demonstrations and trainings on livestock disease and parasites management; breed improvement; on improved forages/floras and their quality; Researches on marketing and value chain of livestock commodities; Researches on adoption of livestock inputs and other technologies; and trainings and researches on modern animal production system were among recommended interventions to minimize these constraints and boost livestock production and productivity.

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