

## Livelihood Analysis of Gasela Community in Amahlathi Local Municipality of the Eastern Cape Province

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### **ABSTRACT**

*The study was conducted to distinguish the livelihood activities that need sustainable development intervention in the Gasela rural community. A sample survey procedure was done on a population of 77 community household heads. A sample size of 65 was randomly selected. It was found that cabbage, spinach, and potatoes were the most crops produced by the community. Wattle forest was used for cooking, housing, and kraal fencing. The households were affected mostly by pests, diseases, environmental stresses, and weather-related shocks. These sources of vulnerability are cited to limit sustainable crop production. Therefore, the recommendations were interventions for the sustainable production of cabbage, spinach, and potatoes. A further suggestion was to investigate the alternative resource for wattle that will provide the same livelihood outcomes for the Gasela rural households when biological control of this invader species is implemented.*

**Keywords:** Livelihood activities, Sources of vulnerability, Sustainable development intervention

### **1. INTRODUCTION**

Livelihood is the means of securing physiological survival needs and other physical essentials at a primitive level. The poverty category begins below this level. The vast bulk of absolute and relative poverty is found in developing countries (Baulch & Hoddinott, 2000). South Africa

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is an example of a country where poverty is prevalent, with unequal societies having persistent high levels (World Bank & Statistics SA, 2018). The Eastern Cape Province is the second-largest and poorest in South Africa (Adekunle, 2013). The primary goal of the 2030 Agenda for sustainable development recognises ending poverty in all its forms. To attain this, the Agenda realises the strategies that build the economy, address social needs, tackle climate change, and protect the environment as key. One such strategy is sustainable development. Only drafts and guidelines delineate South Africa's intentions toward sustainable agriculture (Khwidzhili & Worth, 2017). Hence, there is a need to approve policies on this.

The Gasela community in the Amahlathi Local Municipality was established through land redistribution in 2001. According to Kepe and Cousins (2002), when land, resource rights, and income are secured, people are more likely to invest efforts and resources in conservation and land-use practices that meet the present needs without compromising the ability of future generations to meet theirs. The Eastern Cape Agricultural Economic Transformation strategy (2016-2021) is informed by the overarching Rural Development Framework Policy directive outcome 7. The strategy ensures that life quality, services, livelihoods, and income are improved in rural communities. However, the programs implemented to solve the problems of poverty and food insecurity are continuously failing to produce the desired results (Musemwa, 2013). The study examined the characteristics of the Gasela community's livelihood to distinguish forms of livelihood activities that need sustainable development intervention. A sample size of 65 was randomly selected. It was found that cabbage, spinach, and potatoes were the most crops produced by the community. Wattle forest was used for cooking, housing, and poles for kraal fencing and selling. The households were affected mostly by pests, diseases, environmental stresses, and weather-related shocks. Therefore, the recommendations are interventions for the sustainable production of these most produced crops and investigating the alternative resources for wattle that will provide the same livelihood outcomes for the community.

### **1.1. Objectives and Purpose of the Study**

The study's main objective was to determine how the rural community within the vulnerability context develops livelihood strategies to achieve the desired livelihood outcomes. The purpose was to identify the different types of livelihood assets and activities used by household categories to support their livelihood. Further, determine institutions, policies, and processes

that influence community livelihood strategies. Lastly, provide livelihood outcomes that suggest entry points for sustainable development approaches at the micro and macro-economic levels.

## **2. METHODOLOGY**

### **2.1. Study Area and Research Design**

The study was conducted at Gasela local rural community situated 8 km away from Stutterheim under Amahlathi local municipality of Amathole District in the Eastern Cape Province with GPS coordinates: 32° 37' 58" S 27° 28' 52"E. The area falls under Montana Grassland (Rutherford *et al.*, 2006). A survey method was chosen to sum up the community characteristics and make general statements about the study population using information obtained from the sample (Yin & Heald, 1975). The method is a personal interview survey in the respondent's home. The qualitative and quantitative methods were used to collect information on human behaviour and numerical data, respectively. The mixing method of qualitative and quantitative research presents a comprehensive discussion of the theoretical, methodological, and practical issues (Brannen, 2017). A semi-structured questionnaire collected data from 65 randomly selected household heads. The data was collected in October 2019.

### **2.2. Unit of Analysis and Sampling Procedure**

The study was conducted on key informants and household heads of the Gasela community in Amahlathi local municipality of the Eastern Cape Province. The participants were selected using a sample survey procedure to obtain a sample representing the community household heads population. Based on the rural household head population size of 77, a confidence level of 95%, a confidence interval of 5%, and a response distribution of 50%, it was calculated that a random sample of 65 household heads would be sufficient for a survey of this nature (Raosoft, 2004).

### **2.3. Data Collection Techniques**

A semi-structured questionnaire collected data from key personnel and 65 randomly selected household heads. The type of questioning used to collect data was closed, demographic, contingency, skilled-based, dichotomous, side-by-side matrix, and open-ended questions. The information collected through questionnaires included demographic information, community profile, vulnerability context, livelihood assets, institutions, policies, processes, livelihood

strategies, and livelihood outcomes. Key personnel and household heads were individually visited in their homes. Interviews were conducted face-to-face using the respondent's home language, and responses were recorded manually on the questionnaire. Participation in the survey was voluntary and treated with confidentiality.

#### **2.4. Data Analysis and Interpretation**

The Sustainable Livelihood Framework of the UK DFID was used as a checklist for livelihood analysis. The framework depicted Gasela's rural community as operating in a vulnerable context within which the community has to access livelihood assets. The vulnerability context decisively shapes the livelihood strategies open to people in pursuit of their self-defined beneficial livelihood outcomes (Sife *et al.*, 2010). The Survey data was analysed using Statistical Package for the Social Science (SPSS) version 25.

### **3. RESULTS AND DISCUSSION**

The results present the different livelihood assets and activities household categories use to support their livelihood. Further, the results cover institutions, policies, and processes that influence community livelihood strategies. Lastly, it included the livelihood outcomes that suggested the entry points for a sustainable development approach at the micro and macro-economic levels.

#### **3.1. Human Capital**

Human capital is an individual's productive capacity, inherited and acquired through education and training (Goodwin, 2003). The choices and options to develop strategies for sustainable livelihood are widened by an increase in this capital (Kanel & Niraula, 2017). The education level enabled the Gasela rural community to make informed decisions on livelihood activities that support their livelihood. The education level of respondents is summarised in Table 1.

**TABLE 1: The Education Level of Respondents**

<b>Education level of respondents</b>	<b>Frequency</b>	<b>Percentage</b>
Never been to school	11	16.9
Grade R to Grade 8	36	55.4

Grade 9 to Grade 12	18	27.7
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### 3.2. Natural Capital

The study covered only renewables used by the Gasela rural community. Land, water, and forest were used to support livelihood. It is the pattern that rural households in low- and middle-income countries create employment using livelihood assets (Berchoux *et al.*, 2020). Hence, the Gasela rural community used land, water, and forest for livelihood activities. The main natural capital the households had access to is shown in Table 2.

**TABLE 2: Main Natural Resources the Households Had Access To**

		No of households	Percentage
<b>Land</b>	No	0	0
	Yes	65	100
<b>Water</b>	No	5	7.7
	Yes	60	92.3
<b>Forest</b>	No	6	9.2
	Yes	59	90.8

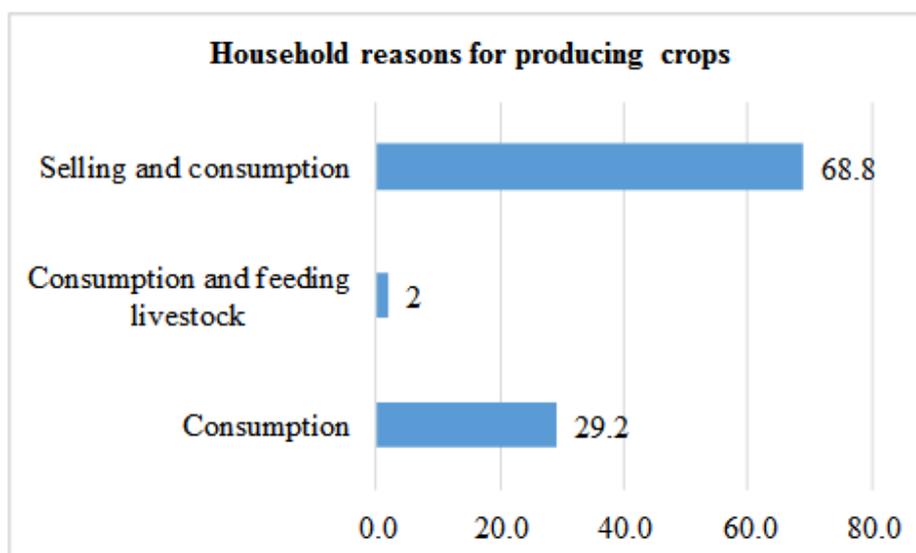
The land was used to produce watermelons, beans, green pepper, potatoes, pumpkin, onion, beetroot, spinach, cabbage, maize, and carrots. The main crops produced were cabbage, spinach, and potatoes. According to Perret *et al.* (2000), cabbage, spinach, and potatoes are the most produced crops in rural communities in the Eastern Cape Province. Table 3 shows crops grown by households.

**TABLE 3: Crops Produced by the Households**

		Households	Percentage
<b>Watermelons</b>	No	62	95.4
	Yes	3	4.6
<b>Beans</b>	No	55	84.6
	Yes	10	15.4
<b>Green Peppers</b>	No	60	92.3
	Yes	5	7.7

<b>Potatoes</b>	No	32		49.2
	Yes	33		50.8
<b>Pumpkin</b>	No	53		81.5
	Yes	12		18.5
<b>Onion</b>	No	46		70.8
	Yes	19		29.2
<b>Beetroot</b>	No	45		69.2
	Yes	20		30.8
<b>Spinach</b>	No	32		49.2
	Yes	33		50.8
<b>Cabbage</b>	No	27		41.5
	Yes	38		58.5
<b>Maise</b>	No	46		70.8
	Yes	19		29.2
<b>Carrots</b>	No	52		80.0
	Yes	13		20.0
<b>None</b>	No	48		73.8
	Yes	17		26.2

The reasons for households to produce crops were consumption, feeding livestock, and consumption and selling. The research participants who produced crops for consumption and sale constitute 68.8%. Raleting and Obi (2015) support the findings that rural communities produce crops for sale and consumption. Figure 1 presents the household reasons for producing crops.



**FIGURE 1: Household Reasons for Producing Crops**

The range of activities of the community was based on the natural capital. Such activities included collecting and gathering in the forest, food cultivation, non-food cultivation, livestock keeping, and pastoralism. Activities of the community are summarised in Table 4.

**TABLE 4: Natural Resource-Based Activities of Respondents**

Natural resource-based activities		Percentage
Collection and gathering in the forest	No	3.1
	Yes	96.9
Food cultivation	No	40
	Yes	60
Non-food cultivation	No	98.5
	Yes	1.5
Livestock keeping and pastoralism	No	56.9
	Yes	43.1

The wood produced from wattle was used for cooking, making fires, housing, and poles for building kraals and selling. The study supports Johnson and Bryden (2012) that most rural communities use firewood as the primary energy source for livelihood activities. The use of the forest by the community is shown in Table 5.

**TABLE 5: Uses of Forest Resources by Households**

Uses of wood	Frequency	Percentage
Cooking and making fire	7	11
Housing and making livestock kraals and selling	58	89

### 3.3. Physical Capital

The households accessed water through the community piped water, household piped water, delivered by the municipality, river, and other (nearby farm reservoir). Most Eastern Cape rural communities access drinking water through groundwater supply (Lehloesa & Muyima, 2000). Even though the source of water accessed by the Gasela rural community was groundwater, the scarcity remains a challenge. Water scarcity burdens rural women as they have to walk more distances in search of water (Sigenu & Pelsler, 2009). The access to water resources by households is presented in Table 6.

**TABLE 6: The Access to Water Resources by Households**

Access of water	Frequency	Percentage
Community piped water	14	22
Household piped water	1	1.5
Delivery by municipality	12	18.4
River	2	3.1
Other (nearby farm reservoir)	36	55

Water was used for consumption, washing, bathing, and irrigation. The Water Poverty Index (WPI) of Amahlathi local municipality falls at 51 (Cullis, 2005). The WPI of 100 is considered a perfect score. However, South Africa falls below that; hence it stands at 52 (Lawrence *et al.*, 2002). Integrated Water Resources Management (IWRM) is recommended for the Gasela community with low WPI. The IWRM encompasses different stakeholders at different levels using water resources to manage water to achieve sustainable development goals of the 2030 agenda. The use of water resources by households is shown in Table 7.

**TABLE 7: Uses of Water Resources by Households**

Uses of water	Frequency	Percentage
Consumption, washing, and bathing	21	32
Consumption, washing, bathing, and irrigation	44	68

The rural community needs equipment and machinery that are economically affordable and environmentally safe to be used locally to produce crops. The types of manual implements used by the participants to produce crops were spade and hoe, and others combined spade, hoe, and rake. The results support Phezisa (2016) that households mostly use manual implements to produce crops from home gardens. Relatively few research participants used a tractor. Adekunle (2014) highlights that the lack of machinery makes most rural communities rely on labour-intensive crop production. Table 8 indicates the implements and machinery used to produce crops.

**TABLE 8: Implements and Machinery Used to Produce Crops**

Implements and machinery used to produce crops	Frequency	Percentage
Spade, hoe	38	58
Spade, hoe, rake	13	20
Tractor	14	22

### 3.4. Financial Capital

The Gasela rural community creates financial capital from different sources such as employment, farming, off-farm activities, forest products, pension, and child grants. The unemployment rate was relatively high compared to the Eastern Cape Provincial unemployment of 37.4% in the first quarter of 2019. The Gasela rural community can improve financial capital through support services, including agricultural and entrepreneurship, networking, and financial education. According to Hamdan (2019), entrepreneurship offers a means to overcome present challenges through sustainable development. Table 9 illustrates the principal occupation of the research participants.

**TABLE 9: Principal Occupation of the Research Participants**

Principal occupation	Frequency	Percentage
Employed	8	12
Unemployed	35	54
Self-employed	2	3
Pension and child grant	20	31

### 3.5. Social Capital

Most research participants know each other, enabling the community to act collectively. Conversely, the productive results in the community were not created by components of social structure. The structural social capital of the community was poor; hence 98.2% were not members of any organisation or social group, and 9.8% were members of Ilima. Bebbington (1997) emphasises the importance of civil society actors in improving agriculture, livelihoods, and resource use.

### 3.6. Institution, Policies, and Processes

The Ilima is a government grant that helps vulnerable communities increase agricultural production. The research participants that were participating in this project were 9.8%. South African agricultural policy on conserving natural resources promotes sustainable resource use. Nevertheless, no organisation was found to promote sustainable resource use in the Gasela community. The social process indicated no interactions that could improve the livelihood quality. Bachke (2019) emphasises that organisation membership has been used to improve market access, access to information, and capacity to increase production. Table 10 shows the membership of the research participants in an organisation or social group.

**TABLE 10: Community Membership to an Organization or Social Group**

Membership in an organisation or social group	Frequency	Percentage
Yes	6	9.2
No	59	90.8

### 3.7. Livelihood Strategies

The livelihood strategies are a set of economic actions influenced by social context to source the location of internal and external resources. The rural community commonly follows a traditional livelihood strategy by adopting two widely known adaptations: intensification of agricultural production and diversification of income sources. The research participants practised no agricultural production intensification. However, the diversification of income sources was a phenomenon; hence there were combinations of off-farm and on-farm activities and revenue generated from crops, livestock, and forest. Diversity is an intrinsic attribute of many rural livelihood strategies (Warren, 2002).

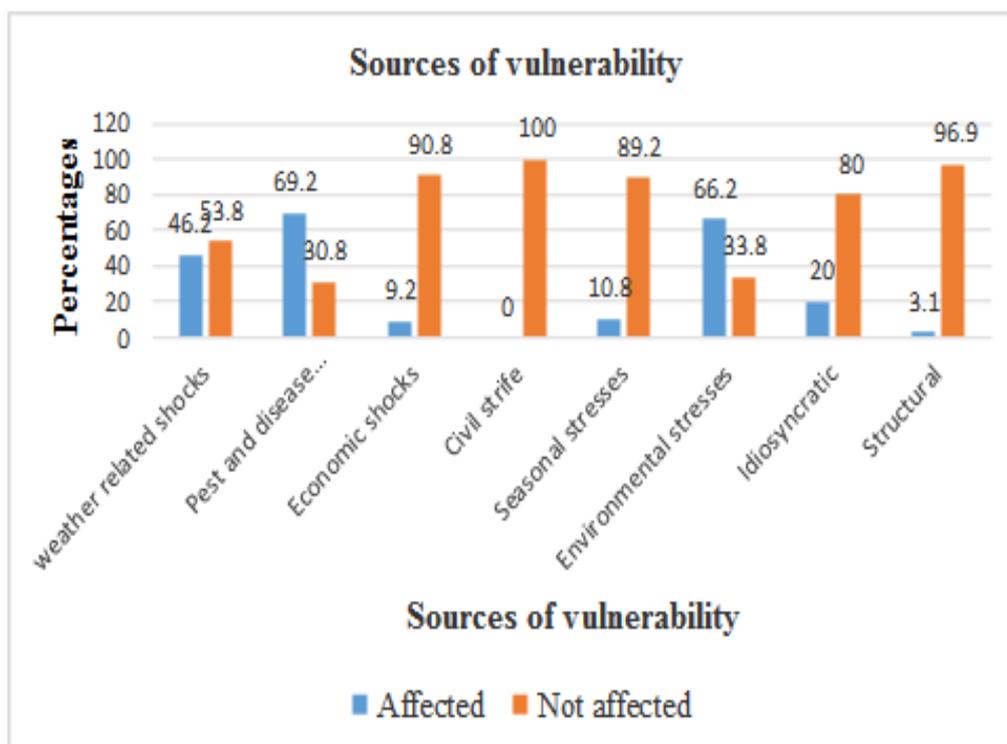
### 3.8. Livelihood Outcomes

The sources of vulnerability found in the community were weather-related shocks, pests, disease shocks, economic shocks, seasonal stresses, environmental stresses, idiosyncratic shocks, and structural shocks. The three main sources of vulnerability with the highest percentages were pests and diseases, environmental stresses, and weather-related shocks. As per Dhanush *et al.* (2015), climate change changes the stages and rates of pathogen development and host resistance, ultimately resulting in changes in the physiology of host-pathogen interactions. To alleviate the effects of pests and diseases, Climate-Smart Pest Management (CSPM) can be used, which reduces pest-induced crop losses, improves the ecosystem, and reduces greenhouse gas emissions (Heeb *et al.*, 2019). The abiotic and biotic stresses were the second-highest sources of vulnerability experienced by the Gasela rural community. Amongst the abiotic stress mentioned by the research participants was the drought that caused the planted seeds not to germinate and seedlings to perish because of water stress. Drought caused some research participants not to participate in crop production.

Biotic stresses mentioned by the research participants were moles in potatoes and aphids in cabbages. According to Hanawalt (1922), with no interest in vegetables, moles primarily eat earthworms, centipedes, millipedes, slugs, and snails. In addition, *Pocket Gophers* are burrowers that create mounds on the soil in the same way that moles do and feed on vegetables (Hafner, 2004). Therefore, it might be inaccurate that the moles are biotic stress in potato production when *Pocket Gophers* are responsible for vegetable damage. The recommendations were that further research be conducted to accurately identify the pests responsible for potato damage in Gasela rural community gardens. Aphids were mentioned as another biotic stress on

vegetable production. The cabbage aphid, *Brevicoryne brassicae* (L.), significantly reduces the percentage of epicuticular wax, dry weight, sugar, and amino acids in cabbages (Khattab, 2007).

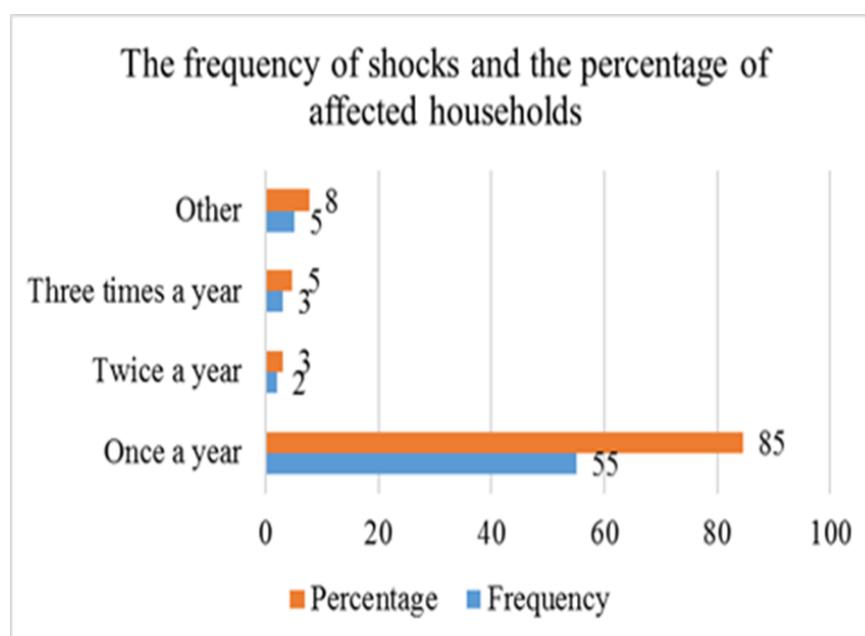
The *Green Peach Aphid* is a significant pest of *brassica* vegetables and a vector of more than a hundred viruses (Ahmed *et al.*, 2018). It was further recommended that research be conducted to accurately identify the type of aphids responsible for cabbage damage in the Gasela community gardens. Plants develop specific mechanisms that enable them to withstand the damaging effect of environmental stress (Chelli-Chaabouni, 2014). Hence, crops with identified stress-responsive genes and overexpression within sensitive crop species are recommended to withstand environmental stress (Ahanger *et al.*, 2017). Figure 2 indicates the Gasela community's sources of vulnerability.



**FIGURE 2: Sources of Vulnerability**

The environment in South Africa is characterised by shocks, with a significant percentage of households being affected, and that threatens daily sustenance (Carter & Maluccio, 2003). The frequency of the sources of vulnerability experienced by the Gasela community on a yearly basis was 55, with 84.6% of people being affected. The principal abiotic stress experienced by

the research participants was drought which led some of the community members to a coping strategy by not participating in crop production. The Eastern Cape Province is highly vulnerable to drought, and the determination to reduce the impact should be a significant research effort (Mdungela *et al.*, 2018). Appropriate risk management strategies, such as prevention, mitigation, and coping, are recommended to manage shocks. The major shocks to be managed in the Gasela community are pests and diseases, environmental stresses, and weather-related shocks. Figure 3 illustrates the frequency of shocks and the percentage of the affected people in the community.



**FIGURE 3: The Frequency of Shocks and the Percentage of Affected Households**

#### 4. CONCLUSION AND RECOMMENDATIONS

Livelihood analysis of rural communities is essential because these communities have the potential to produce or reduce natural resources by their action or inaction. This, in turn, can significantly affect the micro and macro economy. The study was to determine how the rural community within the vulnerability context develops livelihood strategies to achieve the desired livelihood outcomes. The intention was to provide livelihood outcomes that suggest entry points for a sustainable development approach at the micro and macro-economic levels. Crop production was the main livelihood activity in Gasela rural community. The most produced crops were cabbage, spinach, and potatoes. The wattle forest was used to collect firewood, poles for building houses, livestock kraals, and selling. Crops were produced for

consumption, feeding livestock, and selling. The Gasela rural community was affected mostly by three main sources of vulnerability: weather-related shocks, pests and diseases, and environmental stresses. Research participants cited these sources of vulnerability as limiting crop production. Thus the study recommends the IWRM for weather-related shocks existing in Gasela rural community. CSPM is recommended to reduce pest-induced crop losses, improve the ecosystem, and reduce greenhouse gas emissions to alleviate the effects of pests and diseases. The number of gaps that will benefit these findings and enhance this study within the Gasela rural community is:

- To assess soil and water suitability for sustainable production of cabbage, spinach, and potatoes.
- To conduct a Cost-Benefit Analysis (CBA) for sustainable production and marketing of cabbage, spinach, and potatoes.
- To improve their control and management, determine the type of pests and diseases of cabbage, spinach, and potatoes.
- To investigate the alternative resources for wattle that will provide the same livelihood benefits when biological control of this species is implemented.

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