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Full Length Research Article

Livelihood and Adaptability of People Living in the Remote Villages of Temperate Region of Jammu and Kashmir

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ABSTRACT

This study aims to depict the lifestyle of people living in remote villages of the Bhaderwah where there is huge snowfall in winter and area is prone to landslide. The people of these villages do not have proper interconnectivity of transport and communication. They are deprived of various benefits of governmental schemes like Pradhan Mantri Awas Yojna, Mahatma Gandhi National Rural Employment Guarantee Act, Public Distribution System, National Rural Health Mission etc. The purpose of this research is to portray the hardship faced by the people and how they earn their livelihood and cope with various problem emerging in day-to-day life.

***Key words*:** Livelihood, Adaptability, Temperate region, Remote villages

Cradling in the midst of almighty Himalayas, often known as "Chota Kashmir", and in the south-western side is situated most important Hindu pilgrimage "Kailash Kund", there lie a beautiful and picturesque town named "Bhaderwah". It affords beautiful landscape vistas with mesmerizing natural beauty. It is fortified by sky touching mountain peaks which remain grey for most of the year. Bhaderwah town is the tehsil of Doda district in Jammu and Kashmir.

Adaptation to climate change and other shocks and perturbations is crucial both in order to enhance the resilience of both the agricultural sector at large and for individuals to secure and improve their livelihoods [1]. Livestock production has the highest economic value in the present agricultural production system in remote villages of the Bhaderwah, with great potential for further expansion and intensification due to the high availability of grasslands and pastures in areas less favourable for intensive crop production [2]. Agriculture in remote villages of the Bhaderwah, however, suffers from low investment levels and low overall production and productivity, involving rather extensive farming practices and technologies, low levels of financial capital inputs, and productions carried out on small and fragmented farms [3]. This is a problem partly inherited from the past socio-political system, where agriculture was marginalized as a result of industrial development [4]. From a natural resource point of view, remote villages of the Bhaderwah are considered highly vulnerable to climate change. Extreme weather events, such as increased intensity of heavy precipitation resulting in floods and landslides, are increasingly occurring and have already caused significant economic losses and environmental degradation [5]. After studying all the literature and interpreting the statement of problem, following objectives are selected as:

- To assess the livelihood of people in the concerned area.
- To determine the various hindrances impacting the livelihood of people.
- To generate knowledge on impacts driving forces of vulnerability and adaptation mechanism.
- To gather information about their adaptation and resilience.

MATERIALS AND METHODS

The data in the present study is primary data collected through field survey done in selected villages of the Bhaderwah. Different variables regarding the livelihood and adaptation are also considered in the field survey. The valley of Bhaderwah located between 32°5´ N to 34°15´ N latitude and 74°30´ E to 75°40´ E longitude. The altitude of Bhaderwah is 1613m. This area falls under the Himalayan range of Pir Panjal.

Physiography: The study area lies in Middle Himalayas. This comprises the mountain tract locally known as Pahar. This area is known for its scenic beauty. The Pir Panjal representing the Mid Himalayan ranges consist of lofty mountains. For e.g., Kailash Kund. They vary in elevation range from 1500 meter to 3500 meter. This region is famous for the dotted valleys like Jai valley, Bhaderwah valley etc. This whole region is drained by river Chenab and its tributaries.

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Climate

The climate is warm and temperate. It receives significant rainfall even in the driest month. The Koppen-Geiger classification is Cfa. The average temperature is 16.3°C and average rainfall is1206mm. January is the coldest and November is driest month. Due to physical features, climate is variable and varies from subtropical to temperate. The sky remains clear throughout the day with some hazy appearance.

Natural vegetation: The study area is known for its forests and has a great diversity in flora, ranging from deciduous forests and evergreen conifers to alpine pastures. Forests provide habitat to a variety of animal species like Snow leopard, Musk deer, Brown beer, Hangul and Neel etc. In a systematic study the vegetation zone of the area may be classified into following types:

Subtropical forest: These forests are found between 900-1500 mts altitude. Important trees are deodar, pine and fir.

Temperate forests: Temperate forests are dominated by coniferous variety of trees like deodar, pine, spruce, fir, birch etc. These are evergreen trees which can standby in harsh climatic conditions. These forests are found at an altitude of 1500-3350 mts.

Alpine vegetation: This zone lies in 3350-4570 mts and experiences very cold climatic conditions. The low temperature supports shrubs like birch and juniper. This alpine zone comprises lush green pastures and meadows which are called Margs. These are used by the Gujjars and Bakkarwals to graze their livestock. They have many productive, protective and bio-aesthetic functions. e.g., Datura, kuth, Hyoscyanus, Podophylium, Artemisia etc.

Drainage: In Bhaderwah, Neeru is the main river and its tributaries are Haloonnallah, Haliannallah, Kalgandhinallah, Chakkanallah and chinotenallah. All the streams have their source from “Ashapati” and “Kailash” glaciers. The river Neeru joins Chenab near Pull Doda. Another nallah named Bunkund joins Neeruriver at Bhala block that feeds the village khilleni top.

Geology: In the Bhaderwah- bhallesa basin shale, slate, phyllite, quartzite, limestone, massive limestone with shale partings and sandstone comprises the Triassic rocks.

Information is collected through personal interviews of the residents based on questionnaire. To fulfil the aim and objectives of the study definite methodology has to be followed. It is divided into three parts:

Pre field work: This involves the library work to get the information on physiology, climate soil and hydrology of the study area.

Empirical observation: Empirical observations are made to judge the conditions and behavior of people.

Quantitative methods: The methods like percentage and average to calculate data.

RESULTS AND DISCUSSION

Parameters depicting the livelihood and adaptability of peoples of Bhaderwah Tehsil

The various inferences taken are observed during the field survey which reveal the livelihood and adaptability conditions of the people of the area which are shown by selected indicators. These indicators help to understand about the mode of living of the people. The various problems faced by them and their adaptation to the problems. In Bhaderwah tehsil, four village were selected for field investigation on the basis of their location from the Bhaderwah town in cardinal direction. Villages are Thanala, Chinta, Sungli and Khellani. In order to know the various means of livelihood of the people the various parameters are taken like agriculture, horticulture, apiculture, poultry, cattle rearing. The adaptability is shown against heavy snowfall, landslide, and droughts etc.

Agriculture

The agricultural status of the area is depicted through people with proportion of land, the crops grown, role of agricultural department in boosting agriculture and whether the production was sufficient for consumption or not.

Table 1 Percentage of people with their own land

Village	Have	Not have
Thanala	90.9	9.1
Sungli	77.7	22.3
Chinta	68.75	31.25
Khellani	76.19	23.81

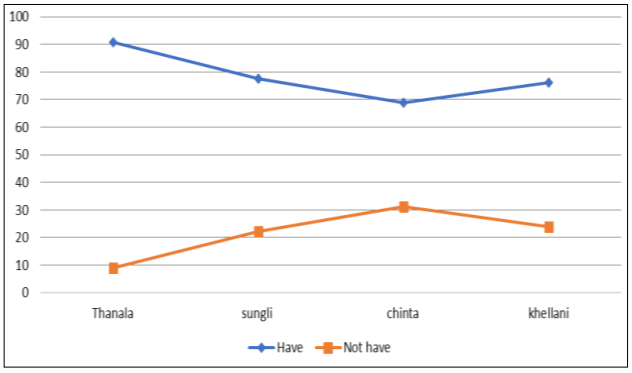

Fig 1 Percentage of people with their own land

Interpretation

From the table we have observed that most of the villager in the Bhaderwah tehsil have their own land for agriculture and there is very less leasing of land. The maximum proportion of people with their own land is in Thanala which is 90.9% however the land here is infertile. The minimum proportion of people with their own land are in Chinta which is 68.75 [6]. The reason behind this is the occupancy of land by army cantonment for which they were given compensation as per the area. The highest number of people and the lowest number with their own land can also be seen from the line graph.

Table 2 Land holding by famers in hectares

Village	Land holding (ha)	Farmers
Thanala	0 – 1	Marginal
Sungli	1 – 2	Small
Chinta	0 – 1	Marginal
Khellani	2 – 4	Medium

Interpretation

From the table we have observed that the farmer in villages of tehsil Bhaderwah is mainly marginal having only one to two hectares of land for cultivation. The classification

shows that in Khellani farmer are medium with 2-4 hectare of land for agriculture while in Sungli it is small with only 1-2 hectare of land holding [7]. In Chinta and Thanala the farmers are marginal and have very less land for cultivation. Moreover, the land is not plain and is suitable for contour farming only.

Table 3 Major crops grown in the villages

Village	Rice	Wheat	Maize	Pulses and Oilseeds
Thanala	0	9.09	72.7	9.09
Sungli	33.3	11.11	38.8	11.11
Chinta	18.75	12.5	50	18.75
Khellani	47.61	9.54	28.57	14.28

Interpretation

As per the data collected from various household regarding the major crop grown in the area it is observed that rice, wheat and maize are the staple crop of people of the area. In Thanala the cultivation of rice is not done due to harsh weather condition and maize is only grown crop with some oilseed in minor quantity [8]. In Khellani and Sungli wheat, rice and maize are grown due to favourable climatic conditions available for their growth. The maximum area under rice is in khellani due to suitable land available for the cultivation.

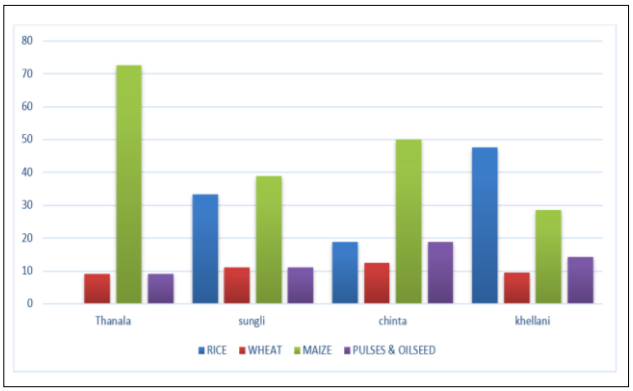

Fig 2 Major crops grown in the area

Table 4 Crop sufficient for consumption and reduction in land area for agriculture over the last 5 years in percentage

Village	Crop sufficient for consumption		Reduction in land over last 5 years	
	Agree	Disagree	Yes	No
Thanala	36.36	63.63	27.2	72.8
Sungli	61.11	38.8	55.5	44.5
Chinta	37.5	62.5	87.5	12.5
Khellani	61.9	38.1	38.09	61.91

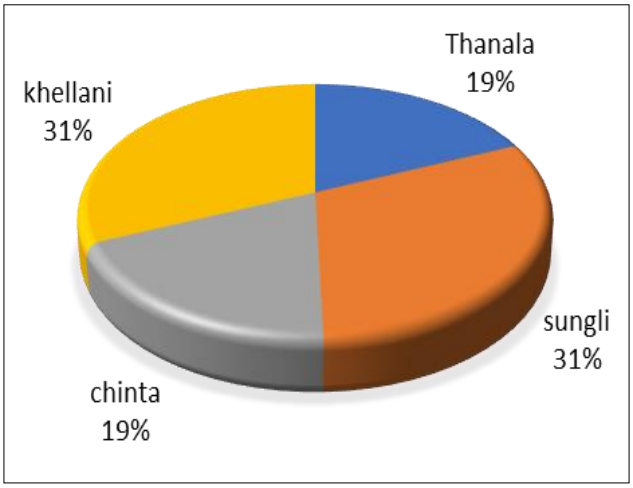

Fig 3 Percentage of people agree over sufficiency of crop for consumption

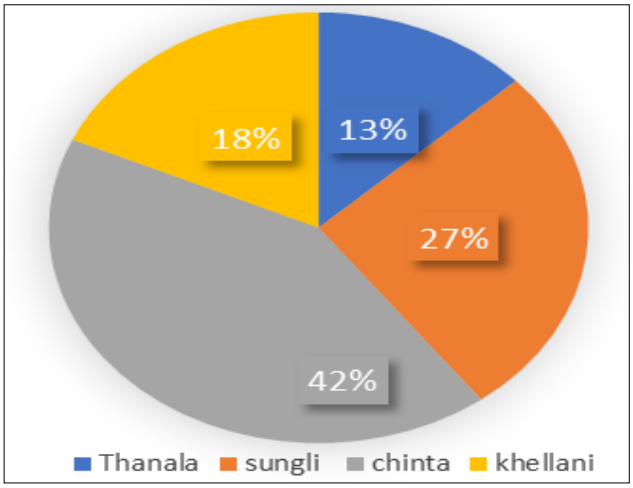

Fig 4 Percentage of people agree with reduction in land area over last 5 years

Interpretation

In Bhaderwah tehsil it is observed that the production of crop is not sufficient for consumption and people are not very much dependent on the agriculture only. In Khellani and Sungli majority of the people are agreed with the production sufficient for the consumption while in Thanala the people said that the production is insufficient and have to rely on public distribution system. Moreover, with passage of time there is reduction in land cover over the past 5 years [9]. In Sungli and Chinta there is lot of reduction in land area. The reason behind it is increasing population, area lost to army cantonment in Chinta and area lost under road construction.

Table 5 Role of agricultural department in boosting agriculture in percentage

Village	Satisfied	Unsatisfied
Thanala	0	100
Sungli	27.7	72.3
Chinta	37.5	62.5
Khellani	19.04	80.96

Interpretation

The role of agricultural department is very less in making people aware about various methods of practicing agriculture. Farmer are unaware about high yielding variety of seeds. The reason behind this is the backwardness of the area.

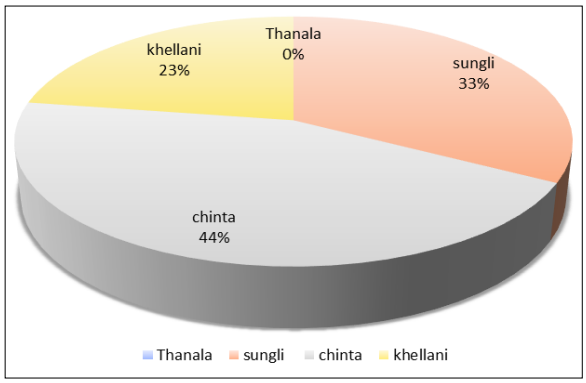

Fig 5 Satisfaction over the role of agriculture department in boosting agriculture

Horticulture and apiculture

The share of horticulture and apiculture as a source of livelihood for people in various villages of Bhaderwah and the role respective department in making people of these villages aware about these sectors as a source of livelihood [10].

Table 6 Share of horticulture and apiculture as a source of livelihood in percentage

Village	Horticulture	Apiculture
Thanala	54.5	45.5
Sungli	66.6	33.4
Chinta	87.5	12.5
Khellani	80.9	19.1

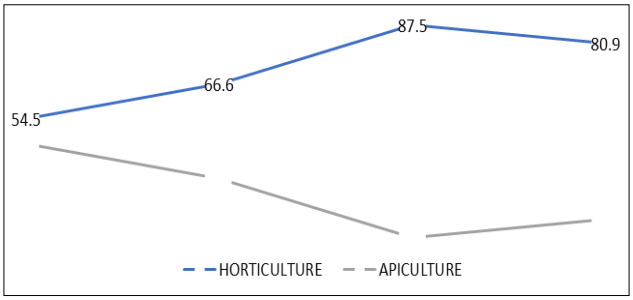

Fig 6 Share of horticulture and apiculture as a source of livelihood in %

Interpretation

In Bhaderwah tehsil the villages being hilly and backward mixed type of farming is practiced. The people have to rely on horticulture and apiculture. Horticulture is one of the chief sources of income of the area. The major fruits grown are apple, peach, pear and apricot. The villages of Khellani and Chinta has higher horticulture and less share in apiculture as source of livelihood for them while in Thanala the horticulture, apiculture is in proportion. Here the fruits like apple and pear are very less grown due to harsh climatic condition [11].

Table 7 Role of horticulture and apiculture department in awaring people about the development of these sectors

Village	Respondents	Satisfied (%)	Unsatisfied (%)
Thanala	11	0	100
Sungli	18	50	50
Chinta	16	25	75
Khellani	21	23.8	76.2

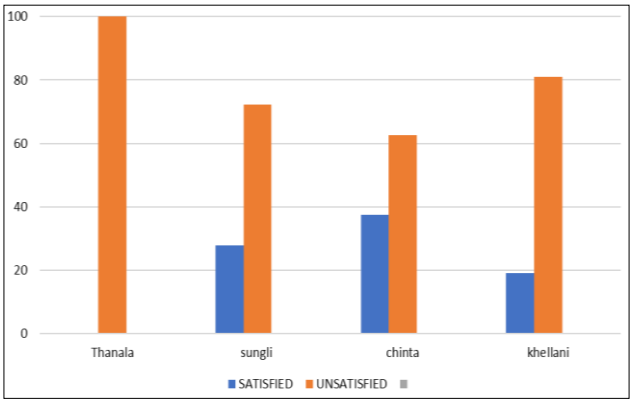

Fig 7 Percentage of people satisfied with role of horticulture and apiculture department

Interpretation

The role of horticulture and apiculture department in boosting their production is very less in Thanala and Khellani. The reason for this is the backwardness of the villages Moreover the people of Thanala wondered that even such department exist. The people are unsatisfied with the roles of these department and these department exist merely on paper without their role in these areas [12].

Poultry and cattle rearing

Both poultry and cattle rearing form an important source of livelihood for the people of these villages which are hilly and backward. The status of these two sectors is shown through the tables and the graph depicted below:

Table 8 Percentage of population engaged in poultry and cattle rearing

Village	Poultry	Cattle rearing	Both
Thanala	27.2	18.18	54.5
Sungli	11.11	61.1	61.1
Chinta	25	37.5	37.5
Khellani	19.04	37.5	38.09

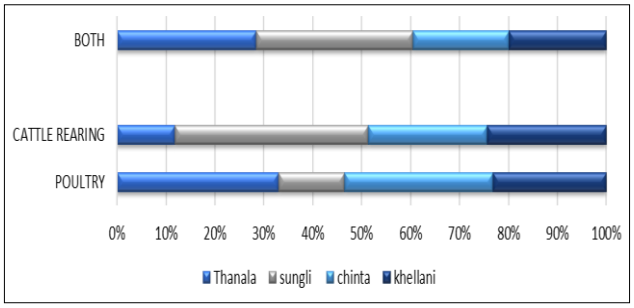

Fig 8 Percentage of population engaged in poultry and cattle rearing

Interpretation

Poultry and cattle rearing is also done in these villages. From the (Table 8) it is observed that majority of people are involved in these two sectors. These two sectors form important source of livelihood of the area. The cattle are reared as the area is endowed with beautiful pastures. The cattle reared are goat, ship and cow [13]. However, this occupation is not pursued on large scale but mainly for their day-to-day source of food and wool.

Himalayan herbs

The area being part of lesser Himalayas are bestowed with various useful herbs which are used for consumption as well as used in making medicines. Due to their use in pharmaceutical industries these are in demand and are costly thus help them in making their livelihood. However, these are used in meagre quantity as too much exploitation of these herbs is illegal. The Himalayan herbs available in these areas are also important source of income to these people. The major herbs are Morchella, Nagchatri and Cumin. These herbs grow in the month of May, June and July. Morchella is readily recognized of all edible mushroom and is costly. Cumin is used in making spices [14-15].

Adaptability

The adaptability of people of these villages to climatic conditions like heavy snow fall, landslides pose various problems in transport, communication, health issue, food and financial problems.

Table 9 Intensity of winters in Bhaderwah

Village	Severe	Moderate	Mild
Thanala	Severe		
Sungli		Moderate	
Chinta		Moderate	
Khellani		Moderate	

Interpretation

The intensity of winters in villages of Bhaderwah ranges from moderate to severe. The precipitation is mainly in the form of rain, snowfall and hailstorm. The village of Thanala have precipitation mainly in the form of snowfall in the winter months. The village receives heavy snowfall in winters. The area remains disconnected with the city of Bhaderwah due to heavy snow fall. Thanala is one of the remotest villages of the area. However, the village gained attention due to its backwardness and is now having road connectivity. The villages of Sungli, Chinta and Khellani have moderate intensity of winter [16].

Table 10 Effect of snowfall on transport, communication and on income of the people in percentage

Village	Transport	Communication	Finance	Health
Thanala	36.3	27.2	90.9	27.2
Sungli	33.3	27.7	22.2	33.3
Chinta	37.5	25	12.25	25
Khellani	38.09	19.04	19.04	19.4

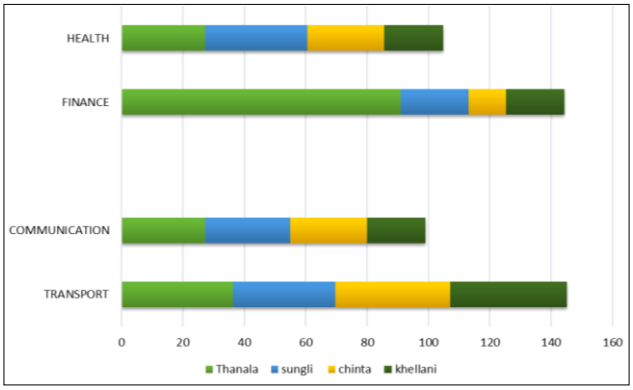

Fig 9 Effect of snowfall on transport, communication and on income of the people in %

Interpretation

The effect of snowfall and other threats posed by it like landslides, avalanches have a profound effect on the life of the people of the area. The people of the area have to face the problem related to transport, communication, health and other financial problems. The transport gets retarded due to blockade of road and landslides and communication is disrupted [17]. These two have huge impact on health issues. The patients suffering from some serious illness remain a victim due to poor transport and communication. Moreover, the source of livelihood like availability of work is very less for people in winter due to which seasonal migration of people can be noticed especially in the young people towards Jammu in search of work.

Table 11 Relief provided by the government to the people

Village	Food	Health	Percentage
Thanala	63.6	36.4	100
Sungli	56.25	53.75	100
Chinta	62.5	37.5	100
Khellani	52.38	47.2	100

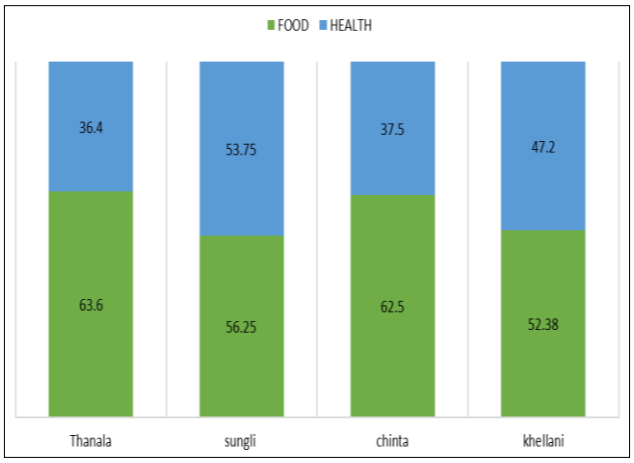

Fig 10 Relief provided by the government to the people (in percent)

Interpretation

In winters a number of problems are posed due to lack of transport and communication which in turn affect the life of the people. The government however, provide relief in the form of distributing food grains free of cost for winter months to the people falling under below poverty line. However, relief provided is not sufficient for them.

Suggestions

From the above study, we came to know that the livelihood of the people is mainly from agriculture and Horticulture. The crop yield is not adequate to meet their requirement. The poor yield is due to primitive agricultural practices, adequate irrigation, fertilizer and unawareness among the farmers about high yielding seed, advanced agricultural techniques. Moreover, the production can be increased if proper consultation can be taken from the agriculture department regarding the cultivation of growing only those crops which are suitable under the prevalent climatic condition.

CONCLUSION

Through the field survey, we have traced out the means of livelihood and adaptation of the people to different problems faced by them in their day-to-day life. The field investigation concluded that village Thanala is more vulnerable and backward village which receive huge snowfall in winter and road connectivity also get disrupted for months which add to the miseries of people. This village needs more attention than other villages. Khellani and Chinta have sufficient resources with sufficient means of livelihood. It has been found that people are migrating toward urban area due to less number of opportunities in their villages. Government should take various initiatives for the development of these remote villages which are still devoid of basic amenities in the present Twenty first century. Technological innovation should be emphasized and proper road connectivity and better communication facilities should be provided to these people. Government education and institution should replicate their number to provide quality education to improve their social condition. More and more awareness should be generated regarding sanitation and health issues. Education, Infrastructure, and people participation (especially women) are necessary for the socio-economic development of the area which in turn reduce the hardships faced by these people and help them in their adaptation to such extreme conditions.

Acknowledgement

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