

# Role of Social Capital on Livelihood Strategies, Food Security and Income of Rural Households in Salale, Oromia, Ethiopia

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**Abstract:** The purpose of this study was to examine the impact of social capital on rural households' income, food security, and livelihood strategies in Ethiopia's North Shea Zone. Utilizing questionnaires to gather data from 400 sample houses, descriptive statistics and econometric methods were used to analyze the results. The influence of the degree of social capital (trust and social organization) on the decision to choose one or more different livelihood strategies, household's income, and food security was examined using a multinomial endogenous switching model (MESM). Depending on the answers to various questions posed to gauge the level of trust, and participation on social organizations were determined. The extent of trust is classified as high, medium, and low while extent of participation is classified as very high, high, medium and low levels. On the other hand, the MESM model divided the available livelihood possibilities into four categories: farming only, farming and non-farming, farming and off-farming, and farming, non-farming, and off-farming livelihood strategies. The estimated results show that high and very high levels of engagement in the social organization of the sample households boost farm households' total farm income and food security status in comparison to low level participant households. At a 1% chance level, this difference is statistically significant. High levels of social trust in the community considerably boost total farm income and food security for households at a 1% probability level when compared to farm households with low levels of social trust. The impact analysis of mean comparison reveals that very high level participation in local social organizations increases the farm households' livelihood diversification strategies by 40% over those of low participant households, while medium trust in the community did not demonstrate any significant relationships. A farmer with a high level of social trust in his community diversified his income sources by 59% more than a farmer with a low level of trust, which is statistically significant at his 5% level. The results of this study therefore have important implications for both the well-being and living standards of beneficiaries, as well as the policies and measures that policy makers use to design strategies to improve rural livelihoods. It is also expected to have a significant impact on policy inputs.

**Keywords:** Trust Social Capital, Livelihood, Diversification Strategies, Multinomial Endogenous Switching Model, North Showa Zone, Ethiopia

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## 1. Introduction

Similar to human, physical, financial, and organizational capital, social capital is crucial for the growth of a society and rural livelihood [2]. Programs for improving livelihoods and reducing poverty use social capital as a program strategy [1, 3].

According to Leonardi and Nanetti, social capital has a significant role in determining the viability and productivity of economic activity. People, norms, and trust all contribute to the coordination and collaboration that boost production and affect coping mechanisms. Social capital is typically understood to be the level of trust, cooperative norms,

networks, and affiliations that exist within a society [5-7]. Thus, social capital is the glue that holds a society together which is divided into three families namely trust, cooperation, and network and is crucial for economic development.

It is essential to comprehend the social capital condition of the household level. Social capital may be broadly separated into two levels: macro and micro. According to Olson and North, the macro level is the institutional context in which organizations function [9, 10]. It is made up of formal relationships and structures like legal frameworks, political regimes, the rule of law, the degree of decentralization, and the degree of participation in the process of formulating policy. Whereas the term "micro level" describes the potential contribution that social networks and horizontal organizations might contribute to development. Cognitive and structural social capital are the two forms that are represented at the micro level [11].

Cognitive social capital is the less tangible aspect of social capital that pertains to values, ideas, attitudes, conduct, and social standards [7]. These values comprise the mutual trust, support, and reciprocity that characterize a community and provide the framework for cooperation across communities for the benefit of everyone. The structure of local institutions at the official and informal levels that support community development, on the other hand, is included in structural social capital. Building structural social capital requires horizontal organizations and networks with responsible leaders, open decision-making procedures, and norms of group action and reciprocal accountability [16, 17]. Thus, the current study focuses on micro level social capital specifically on both structural and cognitive dimensions related to household livelihood situation in a given area.

## 1.1. Literature Review

### 1.1.1. Definition of Basic Terms and Concepts

Social capital is described as the social networks, connections, and trust that individuals or groups rely on to live or progress [16-18, 20]. Social capital refers to the shared resources necessary by households to accomplish acceptable livelihood strategies, such as family support, community ties, and other societal social standards [31]. Social capital promotes social cooperation, enhances the possibility of future mutual cooperation, and boosts government performance [11, 23, 24].

The volume of social capital possessed by a given agent is determined by the size of the network of connections to which he has access and by the volume of capital (economic, natural, cultural, or symbolic) possessed in his own right by each of those to whom he is connected [25, 27]. This means that social capital is not self-contained because it can be shaped or influenced by other capitals.

Social capital improves people's capacity for cooperation, leading to the development of collective action. Collective action's likelihood of success or failure is influenced by social capital [8, 13]. Ostrom and Ahn defined social capital as an aspect of people and their connections that improves their capacity to address challenges via collective action [8, 13].

Social networks, reciprocity, and trustworthiness, in accordance with [8], improve people's capacity for cooperation and the resolution of issues requiring collective action. Thus, the writers recognized that social capital has several dimensions, including social networks, reciprocity, and trustworthiness.

Livelihood strategies may be understood as the result of an actively negotiated process in which families examine available capital assets, realistic household objectives, and choices for attaining these goals within the constraints of capital assets [14]. It is critical to examine existing livelihood methods and outcomes in a given context because context influences the opportunity frameworks within which livelihoods are built [8, 12]. For example, how effectively a region is connected to markets and how accessible transportation facilities are may impact livelihood options [15], as well as mediate the processes by which food crops and cash crops boost household food security [13].

The actions that individuals participate in to secure their survival and satisfy their basic necessities for a living are referred to as livelihood strategies. Rural dwellers struggle on a daily basis and adopt a range of strategies to fulfill their living goals. Understanding the local context of household livelihood strategy is critical for determining the most successful development intervention tactics and their chances of replication in other contexts [1, 3]. Household livelihood strategies may be classified into asset, activity, and income techniques [15, 31]. Economists commonly split families depending on the share of their income derived from various rural economic sectors. Because this approach is simple and successful classifies families into several livelihood groups [10, 15]. Thus it is hypothesized that differentiated access to capital assets such as land, livestock and social capital enable or constrain types of livelihood strategies.

Trust: A common problem in the trust literature is that researchers interpret and operationalize trust differently between theoretical viewpoints and empirical investigations. These disparities are especially noticeable in the explanation of the dimensional character of trust [18, 19, 38-39]. Essentially, two cognitive paradigms originated [38] and evolved substantially in tandem. The literature demonstrates a strong unidimensional focus, notably in the operationalization of trust, with the most often used definitions primarily adopting a unidimensional approach. For example, [26, 40-41] describe trust as the "willingness to be vulnerable to a trustee's actions based on the expectation that the trustee will perform a specific action, regardless of any monitoring or control mechanism." Similarly, Rousseau et al. described trust as a "psychological state consisting of the intentions to accept vulnerability based on positive expectations of the intentions of another." The most often used trust measures only capture a single dimension of trust, which is cognitive in character [21, 42, 43]. For example, the empirical literature has seen a significant uptake of the Mayer trust as a unitary construct and the corresponding 'willingness to be vulnerable' measure [25, 42, 43].

The literature started to make widely acknowledged

differences between cognitive and affect-based trust in the middle of the 1990s, just as the emotional revolution was beginning. Unfortunately, the foundational idea in the literature on multidimensional trust did not take into account how cognition and affect were understood in a broader organizational and psychological context. Affect-based trust is defined as trust that is founded on emotional and mood experiences that are either specific to a certain relationship or more broadly, incidental affect that impacts trust in that connection. This definition is based on the concept of affect.

**Food security:** This term, which incorporates and represents the complicated arguments of nutrition and human rights in food security, has received wide recognition [46, 49]. Additionally, it appropriately covers problems like unequal food distributions within families as well as between nations, the availability of food that is socially and culturally acceptable, how it is purchased, and the nutritional makeup of the food [47].

The four key elements of food security, according to this most current definition, are food availability, food access, food usage, and stability [20, 31 46, 49]. The first part evaluates how easily food is produced, imported, or obtained through food assistance in a certain nation or family. The capacity to purchase food from the market or their own stock is used to determine each person's or household's "physical, economic, and social access" to food [20, 31, 46]. While stability evaluates the existence of food at all times in terms of availability, access, and utilization for there to be food security, the third component is concerned with the actual food processing and absorption capability of the provided nutrient by the body [56].

### **1.1.2. History of Social Capital**

In a wide range of social scientific fields, particularly in the last three decades, the idea of social capital has grown in acceptance and popularity. Although the notion has recently gained popularity, the phrase has been in use for nearly a century, and the underlying concepts date back even longer. The term "social capital" may have originally emerged in a book about how neighbors may cooperate to manage schools that was released in the United States in 1916. Goodwill, fellowship, sympathy, and social interaction amongst the people and families that make up a social unit are some of the physical goods that matter for the most in people's everyday lives [7, 44].

According to some sources, the phrase was developed in part in an effort to comprehend how social organization characteristics like trust, norms, and networks might increase society's efficiency by promoting coordinated activities [50–52]. Collective problems can be solved by voluntary or cooperative social acts. Individuals do this through creating and utilizing social networks and relationships as tools to support productive behavior [26, 28, 45]. Individuals, families, and communities are able to reap some of these advantages and, in doing so, may address some of the difficulties they share by sustaining the social links and institutions required for collective engagement [34, 37]. According to Sean F.

Everton, social capital is made up of both networks of elective relationships between individuals, which may be vertical as in authority relationships, or horizontal as in voluntary organizations, and of the trust and expectations which flow within those networks" [48, 49]. He continues by saying that social capital includes the vertical expectations placed on people like patrons, leaders, and politicians to be satisfied during difficult times. [50–52] emphasizes the significant part that relatives plays in rural households' coping mechanisms when faced with ongoing calamity [21, 23]. The two forms of social capital that emerge from social institutions are vertical (based on patron-client relationships of power) and horizontal (based on equal social ties) [11, 23, 47]. Social capital is divided into the structural and cognitive types of phenomena [11, 43]. Concepts like civic society and social connectivity are related to social capital [56, 57].

### **1.1.3. Dimensions of Social Capital**

The definition of the phrase "social capital" varies depending on the source. The two most important concepts in the three most frequently used definitions of social capital are trust and social networks [25, 50–52]. Coleman, on the other hand, describes social capital as being multifaceted, relational, and productive. According to him, social capitals are a component of the social structure and enable specific behaviors in those who belong to the structure. Bourdieu, who defines social capital as the sum of the actual or potential resources linked to ownership of a lasting network of more or less institutionalized relationships of mutual acquaintance and recognition, or, in other words, to membership in a group, provides the third most frequently cited definition of social capital in the literature [25, 52].

This article's definition of social capital is based on Reimer's (2002) claim that it is one form of asset or resource that may be leveraged to accomplish desired results. It is a component of production that is invested in more production in the future as capital. Social forms as they are manifested in organizations, group activities, networks, and interactions are referred to as social capital [7]. From this perspective, social capital is a relationship quality rather than an individual one [26, 29].

With Fitzpatrick's (2013) concept, social capital may be understood and affected in a variety of ways. They base their definition of social capital on four different kinds of social relations: market, bureaucratic, associative, and communal, which stand for the many ways that connections are arranged and controlled in order to achieve objectives. Market relationships are focused on economics, whereas bureaucratic relationships are based on a logical division of labor and the structure of power using a set of general guidelines and regulations [7, 43]. Community bonds are founded on shared identities, and associative links are evident in voluntary associations and informal organizations [46]. These four different types of relationships are not mutually exclusive [47, 49] and frequently all four are present at once with different outcomes. The following complementary category of social capital was developed by Upoff to broaden the understandings

of social capital.

While cognitive social capital refers to ideas, beliefs, attitudes, social norms, and behaviors that exist in the community such as social trust and norms, structural social capital refers to networks, connections, and practices within and across community groups [38, 39, 51]. Beyat explained that whereas cognitive social capital predisposes people to engage in a socially desirable manner, structural social capital promotes social contact [51]. Both are interacting and mutually reinforcing.

#### **1.1.4. Social Capital and Livelihoods**

Social capital may be utilized to preserve and enhance lives, much like other kinds of assets. The characteristics of social organization, such as trust, norms, and networks that might increase society's efficiency by allowing coordinated activities, can be referred to as social capital, as was mentioned in the sections above [50–52]. Both the number (density) and quality of interpersonal ties affect social capital [52]. Institutions control the formation and utilization of social capital because it is ingrained in social structure and interpersonal relationships [53]. Building social capital can take place in a "nursery" that is an engaged civic society [55].

From a micro, meso, macro, or integrated viewpoint, social capital can be seen [27–28, 56]. Bourdieu's early studies on social capital emphasized the micro, or individual, perspective. From a personal standpoint, social capital has lately drawn attention to both the advantages of group engagement for an individual [55] and the intentional cultivation of sociability in order to produce this resource [28, 29].

Like other forms of capital, individuals or households can then make a conscious investment in social capital. However, social capital is not often created on purpose (Larsson *et al.*, 2016). In reality, Coleman claims that most of it is produced as an unintentional by-product of individuals engaging for another reason, such as opportunistic business motives or just because we are social creatures and, within reason, get benefit from associating with others [53].

It is now conceivable to speak about the stock of social capital at the local, regional, or national level thanks to newer and more expansive perspectives on social capital [29, 54]. This is the perspective on social capital that [55] adopted in his study on the impact of horizontal linkages on the effectiveness of government. The individual's contribution to the creation of social capital is frequently ignored from a meso or macro viewpoint, which takes the stock as given. The goal of an integrative viewpoint on social capital is to incorporate aspects of all of these perspectives.

Social capital is not a homogeneous entity, like other types of capital [27]. Social capital may be divided into three categories: connecting social capital, bridging social capital, and bonding social capital [11, 28]. Strong links between family members, neighbors, and business partners are referred to as bonding social capital [28]. These groups have a tendency to be more homogenous [30] since they come from comparable social and economic backgrounds. This can be advantageous since it facilitates information flow [58], but it

can also be constrictive because the similarities reduce variety [56, 59]. Weak links that link people from different racial and occupational groups together are considered to be part of social capital [57]. These are horizontal relationships between people with various origins but comparable economic and social status [29].

Such connections' ability to foster diversity is one advantage. Ties between different social and economic groups, such as those between impoverished homes [13] and those with sway in formal institutions like the government, the police, and banks [33], constitute linking social capital [43]. This kind of connection can facilitate the communication of information between people in positions of power and the underprivileged. The value of social capital for families looking to use it to enhance lifestyles relies on the quantity, kinds, and quality of relationships that a household has, where quality refers to how well established the ties are [37]. Weak links that people from different racial and vocational groups have with one another make up bridging social capital.

Social capital may be a limiting factor in the activities and assets that families might choose to employ, despite the fact that discussions of social capital have tended to emphasize its benefits to both people and society [59]. The formation of social networks for some people may result in the exclusion of others; those who are not members may not gain from group engagement and may even suffer consequences. The advantages of variety in economic activity and ideas may be limited by group uniformity. Additionally, groups may encourage homogeneity, which can impede innovation and restrict commercial success. Those who do succeed can feel pressured to help those who did not fare as well. Additionally, a group's social capital, which originally had a positive value, may start to have negative effects by subjecting its members to onerous personal commitments that make it harder for them to gain from working together in larger groupings [29].

Families that live in a setting where they can form relationships can use such interactions to preserve and increase their standard of living [11]. Social capital may (or may not), as shown by the prior discussion, be important to families on its own or when combined with other types of capital to sustain and enhance standard of living. It can be improved via investment [40], drained through usage or neglect (a type of depreciation), or converted [8] much like other forms of capital. Investment in social capital denotes actions that strengthen a household's ability to access social capital. The family has a right to reciprocal activities from those who receive aid when they take certain actions, such as working for a neighbor or buying food for a relative who is in need [11]. Participation in organizations like farmers' clubs, churches, and other groups [59] can foster a culture of trust and cooperation that can be used to group action [44]. The benefit of being able to use social capital for maintaining one's livelihood might be significant.

Because institutions vary between geographic regions and even within regions and communities, as well as because household investment in social capital, whether the investment is intentional or unintentional, varies, social

capital is not distributed evenly geographically or socially [12]. As a result, different livelihood strategies may use social capital differently. What steps may be made to assist create social capital is crucial since it can be a significant part of a livelihood plan. There are three ways to "thicken" civil society, as he puts it, or to build social capital. First, state residents may be able to hold influential positions and make the most of their resources to enhance neighborhood associations and their connections. Second, community-based organizations such as NGOs, churches, international organizations, and other groups can use resources, including their own social capital, to help create local organizations and social capacity, or the ability to generate social capital on their own. Third, by forming organizations and fostering various forms of social contact, local groups may mobilize and develop social capital on their own. The institutions that control these interactions as well as their density and quality may be impacted by these acts. Households may be better able to invest in social capital and utilise it in their livelihood strategies by developing an environment that supports social capital development.

### **1.2. Problem of the Statement**

One of the less developed nations is Ethiopia, where a significant portion of the rural population experiences food insecurity and poverty. For the majority of rural Ethiopians, smallholder farming is the main source of income, but it is also the main cause of susceptibility to poverty, food insecurity, and recurring famines [34]. According to Devereux and Guenther (2005), Ethiopian smallholders are stuck in a low productivity trap with plots that are too tiny to support themselves only via agriculture because of the issue of unpredictable weather and failing harvests every few years.

The livelihoods of rural people come from a variety of sources and are not as heavily reliant on agriculture. The most disadvantaged rural people' capacity to diversify at all is frequently crucial for ensuring their ability to get food [45]. The restricted options for livelihood strategies and lack of additional income from various non-farm activities, according to Asmamaw (2004) and Geremew (2017), have increased the vulnerability of the rural poor in Ethiopia [31–32].

It is argued that the decline in the amount of arable land is anticipated to further exacerbate the already observed worse food insecurity situation unless non-farm activities are made to make up for the livelihood stress prevalent [31–34] given that the majority of Ethiopian smallholders are unable to make a living from agriculture due to resource constraints and recurrent shocks. Vulnerable households who have little social capital and are not actively participating in local institutions run the risk of failing [33]. Rural families require resources and assets that would have been acquired via such a system in order to achieve livelihood security.

Despite the persistence of poverty and food insecurity sit Despite the uation that are common in the study region, no more research has been conducted on the impact of social capital for rural families' alternative household livelihood strategies and the state of their access to food and nutrition. In several regions of the country, studies on food security and

livelihood have really been conducted. The findings of research conducted in various regions of the nation demonstrate that the state of food insecurity and rural families' methods for generating income vary depending on the region, the kind of home, and even the individuals who make up the household. In general, figuring out how households make a living can assist policymakers develop solutions to the community's food security issues. The study on livelihood strategy, according to Barret et al. (2001), gives significant insights into the kinds of interventions that could be successful in lowering poverty and vulnerability. In Ethiopia, it's crucial to comprehend the various households' modes of subsistence in order to develop effective policy solutions to the issue of food insecurity. This particular study is therefore intended to produce location-specific analyses of the household livelihood strategies used in the study region [15].

Moreover, in Ethiopia in general and North Shoa Zone Oromia Region in particular people are known with their strong social ties. People usually cope-up with unfavorable conditions with the social values and norms they have. Especially, in resource poor areas where external climate and non-climate shocks are high, social capital and local institutions play great role in enabling household members to support one another. During the most serious times in the history of Ethiopia, social networks and cultural ties between different community categories have helped the poorest of all to sustain their lives [36]. In Ethiopia, various local institutions like Idir, Equib, Mehiber, Senbete, Debo, local money lending, etc are used during times of challenges and successes [35, 37]. These institutions normally serve as sources of finance, labor, agricultural capital and even land. In most cases, the very resource poor farmers who do not have oxen, farm implements, and cash to buy seed and other inputs are supported through such local institutions based on their social capital level (ibid). Thus, social capital is found to be crucial in rural areas to improve their livelihood.

Even whatever assistance the government or donors provide throughout Ethiopia's historical struggles pales in contrast to what is required in their impoverished circumstances. Communities typically employ their social capital in situations like these, enlisting the help of family, friends, the local elite, and established local institutions to resolve issues [36]. Consequently, as social capital is a significant economic variable for Ethiopia's rural population, pinpointing its determinants is essential for guiding development practitioners' efforts and providing guidance for policymakers.

On the other hand, vast bodies of the literature revealed that there are different factors that determine participation of the rural households in different social capital activities which in one way or the other affect the choice of livelihood activities. This may also have a direct relation with food security. Hence, based on the insights gained from the literature, the current study tries to see if what is argued in the different parts of the world holds true or not in the study area where this research is going to be carried out.

Evidence suggests that families in Ethiopia as a whole, and

in North Shea Zone, Oromia region in particular, are dominated by men in terms of decision-making. It was believed that women lacked the authority to command over agriculturally productive resources and bring in money. As a result, women in a nation where men predominate, such as Ethiopia, are likely to suffer when food is distributed within households. Compared to males, people are less concerned about the education and welfare of girls. Boys are frequently viewed as assets to families, whereas girls are frequently considered as burdens (liabilities). As a result, the wellbeing of males is prioritized over that of daughters. Women play a significant role in economic progress. Thus, the differential roles of gender in a given social capital [36], and contribution to livelihood need to be analyzed in the study area. Thus, it is apparent that the role of gender in building livelihood system and social capital has to be studied, especially among communities of North Shea Zone of Oromia Region.

Thus, this study is intended to explore the livelihood strategies, identify determinants of social capital and livelihood strategies, their effect on food security and income and analyze the differential roles of gender on social capital formation and choice of livelihood strategies in the North Shoa zone of Oromia region.

## 2. Methodological and Analytical Framework

### 2.1. Multinomial Endogenous Switching Regression (Mesr)

In the second stage of multinomial endogenous switching regression, the relationship between the social capital and food security outcome variables and a set of explanatory variables ( $z$ ) is estimated for each social capital participation e.g.  $j=1$  (non-participant as a reference category); participation in local organization,  $j=2$ , trust and solidarity,  $j=3$  and both participation in local organization and trust,  $j=4$ . The social capital and food security outcome equation for each possible regime ( $j$ ) is given as:

$$\begin{aligned} \text{Regime 1: } Y_{1it} &= \beta_1 z_{1it} + \delta_1 z_{1i} + \mu_{1it} \text{ if } U=1 \\ \text{Regime J: } Y_{jit} &= \beta_j z_{jit} + \delta_j z_{ji} + \mu_{jit} \text{ if } U=j \end{aligned} \quad (1)$$

where  $E(Y_{jit} | X, z) = 0$  and variance  $(Y_{jit} | x, z) = j_2$  are the distributions of the error terms ( $\mu_{jit}$ ), which represent the social capital and food security outcome variables of the  $j$ th farmer in regime  $j$  at time  $t$ . If just one of the various social capital participation combinations is applied,  $Y_{jit}$  is observed.

Unobserved heterogeneity is an issue that can be reduced using this method (Mundlak, 1978; Wooldridge, 2010). Unobserved individual effects ( $\mu_{jit}$ ) plus a random error term ( $U_{jit}$ ) make up the error term ( $U_{jit}$ ). As a result, if  $\mu_{jit}$  and  $U_{jit}$  are not independent, OLS estimates in Eq. (2)  $\mu_{jit}$  and  $U_{jit}$  will be skewed. The selection correction terms of the other options must be included in Eq. (2) for a consistent calculation of and. There are  $j-1$  selection correction terms in the multinomial choice situation, one for each possible combination of participation. The second stage of MESR with consistent estimates [31].

$$\begin{aligned} \text{Regime 1: } Y_{1it} &= \beta_1 z_{1it} + \alpha_1 \lambda_{1it} + \delta_1 z_{1i} + \mu_{1it} \text{ if } U=1 \\ \text{Regime J: } Y_{jit} &= \beta_j z_{jit} + \alpha_j \lambda_{jit} + \delta_j z_{ji} + \mu_{jit} \text{ if } U=j \end{aligned} \quad j = 2, 3, 4 \quad (2)$$

where  $\mu_{jit}$  is the expected-zero error term,  $\lambda_{jit}$  is the covariance between variables, and  $U_{jit}$ ,  $\mu_{jit}$  is the inverse Mills ratio calculated using the probabilities obtained in Eq. (2) as follows:

$\lambda_{jit} = \frac{(\mu_{jit} - \mu_j)(\mu_{jit} - \mu_j)}{(1 - \mu_j) + \ln(\mu_{jit})}$ . The correlation between  $\mu_{jit}$  and  $U_{jit}$  at this time is 0. To account for the heteroscedasticity resulting from the produced repressors as a result of the two stage estimation approach, standard errors in Eq. (8) are bootstrapped.

The MESM model was also used to analyze how the sample families' means of subsistence impacted their food security.

### 2.2. Estimation of Average Participation Effects on the Participant

To calculate average treatment effects on the treated (ATT), the multinomial endogenous switching regression methodology discussed above is applied. We evaluated the predicted values of participant and non-participant outcomes of different social capitals in real and counterfactual scenarios, as shown below, to determine the average treatment on the treated;

Adopters who really adopt

$$E(Y_{jit} | U = J, Z_{jit}, z_{ji}, \lambda_{jit}) = \beta_j z_{jit} + \delta_j z_{ji} + \sigma_j \lambda_{jit} \quad (3)$$

Participants had decided not to participate (counterfactual)

$$E(Y_{jit} | U = J, Z_{jit}, z_{ji}, \lambda_{jit}) = \beta_1 z_{1it} + \delta_1 z_{ji} + \sigma_1 \lambda_{jit} \quad (4)$$

The aforementioned equation specifies the value of the outcome variable for participants that would have been attained if the coefficients on their characteristics ( $Z_{jit}$ ,  $Z_{ji}$ , and  $\lambda_{jit}$ ) had been equal to the coefficient on the non-participant variables [31]. By adopting the disparities between actual and counterfactual results [31] as a starting point, it is possible to determine the predicted values of the social capital/livelihood strategies and food security outcomes for the families that participated in social capital/livelihood strategy  $j$ .

$$ATT = E(Y_{jit} | U = J, Z_{jit}, z_{ji}, \lambda_{jit}) - EY_{jit} | U = j, Z_{jit}, z_{ji}, \lambda_{jit} \quad (5)$$

$$Z_{jit}(\beta_j - \beta_1) + z_{ji}(\delta_j - \delta_1) + \lambda_{jit}(\sigma_j - \sigma_1) \quad (6)$$

The expected change in the mean outcome variable if participants had the same characteristics and resources as non-participants is captured by the first term ( $Z_{jit}$ ) on the right-hand side of eq (5). The third term ( $\lambda_{jit}$ ) on the right-hand side of the Eq. (6) along with the Mundlak approach ( $z_{ji}$ ) corrects selection bias and endogeneity originating from unobserved variables.

### 2.3. Sampling Design and Data Collection Methods

Many studies used multistage sampling methods to select sample respondents for their studies using household level cross sectional data in conducting survey in collecting the

required data of both qualitative and quantitative data types to model program participation using multinomial logit.

Similar to that, the information for this study comes from a survey of farm households carried out in 2022 by skilled enumerators. A structured questionnaire was used to interview households about a wide range of issues, including household demographics, cropping patterns, livestock ownership and husbandry habits, market behaviors, social capital participation, food consumption, credit availability, and livelihood options. In order to glean more knowledge on social capital and its function in livelihood strategies that may support the quantitative analysis used to evaluate the effects of the practices, key informant interviews (KIIs) were also performed. The KIIs was led by a set of general questions that left room for new ones to be raised as the talks went on. These interviews' open-ended format made it easier to record information that the conceptual framework might not have anticipated. The conclusions of the evaluation have been explained using information from these interviews.

This study's sample was drawn from smallholder farmers in North Shoa Zone Oromia Region, Ethiopia. To select respondents, a multistage sampling procedure was used. In stage one, three districts was selected randomly. In the second stage, eight existing peasant associations were selected random. Finally, using a pretested interview schedule, simple random sampling based on proportion to size was used in the final stage to select sample farmers for the interview from a source list obtained from the respective district agricultural office.

### 3. Data Analysis

#### 3.1. Level of Household Social Capital

##### 3.1.1. Level of Trust in Farm Households

One of the types of social capital that is part of cognitive social capital is trust. [50-52] views trust as a source of social capital that supports economic dynamism and governmental success, while [17, 18, 29] views a system of mutual trust as an important type of social capital on which future commitments and expectations may be founded. Trust is a crucial component of the relational dimension of social capital [39]. In this study, we made the supposition that a household's level of trust with others in the community is based in part on relational and bonding types of social capital [38-43].

Level of trust was determined based on the household survey using the combination of different trust variables. These variables include: (1) if the household or any of the family member of his/her household above 18 years old being trusted by other in access to finance during bad times, (2) if others trust him, and number close friends able to give him credit were asked the respondents were summarized into low, medium and high level of trust to the that farm household. According to the survey result 28 percent of the farm households have low level of trust in the community where as about 30 percent and 42 percent of the sample households believe they have medium and high level of trust in the community (Table 1).

The survey's findings indicate that the majority of North Shawa Zone households have high levels of trust, which suggests that the majority of the sample households have high levels of social capital. This implies that households in the North Shawa zone likely to use social capital to overcome the problem by borrowing from their neighbors or friends as a coping mechanism during difficult periods like climatic and non-climatic shocks, which are common in the research area.

**Table 1.** Descriptive results for extents of household trust.

Extents of trust	Freq.	Percent	Cum.
Low	110	27.50	27.50
Medium	121	30.25	57.75
High	169	42.25	100.00
Total	400	100.00	

Source: own survey, 2023.

##### 3.1.2. Status of Participation on Social Organization

The involvement of people or households in various local institutions is one of the structural social capitals. During the household survey, the study discovered that stallholder farmers in the North Shawa Zone participate in a variety of local groups, both formal and informal. Iddir, Equb, cooperatives, local loan and saving associations, kebele administration, women's groups, and other institutions are among these.

The survey's findings revealed that farm households' levels of involvement in various social groups varied depending on the type of organization and other factors. As a result, four categories—low, medium, high, and very high—were created to classify the level of social capital that was represented in involvement in various social organizations.

The data was based on the fact that if the household or one of its members is classified as low by fewer than three organizations. if the household participates in three or four community groups, it is considered to have a medium level of engagement; if it participates in five or six organizations, it is considered to have a high level of participation. Whenever a household or one of its members belongs to more than seven local groups, the organization is said to have a very high degree of social capital or level of participation. The study result shows that 26 percent of the sample households participate in maximum of two organizations in the community. Moreover, 27.75 percent and 25.25 percent of the sampled households are medium and high level of participation in social organizations. Households with very high level of participation in social organizations are about 20.25 percent of the total households. Thus, relatively more households in study are mainly categorized under medium level of social capital (Table 2).

**Table 2.** Farm households' extents of participation in local social organizations.

Levels of participation	Freq.	Percent	Cum.
Low	107	26.75	26.75
Medium	111	27.75	54.50
High	101	25.25	79.75
Very high	81	20.25	100.00
Total	400	100.00	

Source: Own survey, 2023

### 3.2. Descriptive Results of Outcome Variables Across Livelihood Strategies

#### 3.2.1. Social Capital Across Livelihood Strategies

##### (i) Extent of Participation Along LH Strategies

The descriptive statistics result shows that 4.5, 4.5, 12.8 and 5% households with farming only, farming plus non farming, farming plus off farming and farming plus on and off farming livelihood strategies respectively have with low level of social participation in the study area. Medium level of participation in social organizations across livelihood strategies shows that 10.2, 22.5, 7.5 and 3.8% households respectively are with in farming, farming plus non farming, farming plus off farming and farming plus on and off farming livelihood strategies. Similarly, 2, 1, 2.2, 8.5 and 5.5% in high; and 3.2, 2.2, 6.5 and 6.2% in very high participations respectively households are in farming only, farming plus non farming, farming plus off farming and farming plus on.

and off farming livelihood strategies. At a 1% probability level, the chi-square test revealed there is a statistically significant mean difference in level of social participation among the four groups of livelihood strategies (Table 2).

##### (ii) Extent of Trust in Livelihood Strategies

Extent of trust along different livelihood strategies in North Showa Zone were identified. In this regard the level of trust of

the household with in the community was found different with in different livelihood strategies. The survey result shows that 7, 10, 8.8 and 7% of households with low level of trust respectively were found under farming only, farming plus non farming, farming plus off farming and farming plus on and off farming livelihood strategies. Similarly 6.8, 5.2, 9.8 and 8.5% medium trust level farm Household and 6.2, 10, 15.8 and 10.2% high trust farm households are respectively, found under farming, farming plus non farming, farming plus off farming and farming plus on and off farming livelihood strategies (Table 8). At a 1% probability level, the chi-square test revealed a statistically significant mean difference in level of social participation among the four groups of livelihood strategies (Table 8). ategies, respectively. The chi-square test revealed that at a 1% probability level, there is statistically significant mean difference in level of social participation among the four groups of livelihood strategies (Table 3).

#### 3.2.2. Food Security Across Livelihood Strategies

The result shows that 66.5% of the households are food secure while the rest 33.5% farm households are food insecure. The survey shows that 11, 7.8, 5.5 and 9.2% are food secure while 9, 17.5, 28.8, and 11.2% food insecure respectively under farming only, farming plus non farming, farming plus off farming and farming plus on and off farming livelihood.

Table 3. Descriptive statistics for social capital variable over livelihood strategies.

Variables		Farming		Farming +non		Farming +off		Farming + non + off		Total		X <sup>2</sup> -value
		Num	%	Num	%	Num	%	Num	%	N	%	
Extent of participation	L	18	4.5	18	4.5	51	12.8	20	5	107	26.8	76.3***
	M	41	10.2	25	22.5	30	7.5	15	3.8	111	27.8	
	H	8	2	49	12.2	22	5.5	22	5.5	101	25.2	
	VH	13	3.2	9	2.2	34	8.5	25	6.2	81	20.2	
	T	80	20	101	25.2	137	34.2	82	20.5	400	100	
Extent of Trust	L	28	7	40	10	35	8.8	7	1.8	110	27.5	28.8***
	M	27	6.8	21	5.2	39	9.8	34	8.5	221	30.2	
	H	25	6.2	40	10	63	15.8	41	10.2	169	42.2	
	T	80	20	101	25.2	137	34.2	82	20.5	400	100	
	IS	44	11	31	7.8	22	5.5	37	9.2	134	33.5	
Food security	Sec	36	9	70	17.5	115	28.8	45	11.2	266	66.5	40.6***
	T	80	20	101	25.2	137	34.2	82	20.5	400	100	

### 3.3. Food Security and Income Analysis

#### (i) Food Security Status of Sample Household

In this study, household food security was assessed by analyzing household food calorie consumption within seven days using data on food type and amount consumed. The household food consumption for seven days was converted into calorie, and the calories are divided by the number of Adult Equivalent (AE) in the household. Then the result is again divided to seven days which resulted in on average calorie consumed per Adult Equivalent per day in a given household. Based on the result, households were categorized into food secure and food insecure which is by taking the minimum calories required per AE per day of 2550kcal as cut off points or the daily minimum subsistence requirement of

2550kcal per AE which is set by the Ethiopian Government. Therefore, based on 2550kcal as cutoff, the study result indicated that 66.25% of the total sample households are found to be food secured and the rest 33.75% are not (Table 4).

Table 4. Household level food security status of sample households.

Food security status	Freq.	Percent	Cum.
Insecured	135	33.75	33.75
Secured	265	66.25	100.00
Total	400	100.00	

Source: Own survey result, 2023.

#### (ii) Household Level Nutrition Status

In addition, household level nutritional status was measured



by using household dietary diversity score. Data on household dietary diversity was collected using 24-hour recall method and the household dietary diversity score is calculated by summing the number of food groups consumed by the household as a whole and not a single member during the last

24 hours prior to the survey. However, food consumed outside the home which was not prepared in the home was not included. The study result indicated that level of nutrition security status of sample households is 3440.70 Kilocalories per household (Table 5).

**Table 5.** Household level food security status of sample households.

Variable	Obs	Mean	Std. Dev.	Min	Max
Kilocalories	400	3440.678	2003.817	74.23	15531.9

Source: Own survey result, 2023.

### (iii) Household Level Income Status

The mean annual income of survey households indicated that on average a household earn Birr 118,004.20. The minimum and maximum total income of the farm households were 5100 and 874,000 Birr per year respectively.

**Table 6.** Household level income status of sample households.

Variable	Obs	Mean	Std. Dev.	Min	Max
Total income	400	118004.2	157673	1500	874000

Source: Own survey result, 2023.

### 3.4. Impact Evaluation Results: Second Stages of Mesr

#### 3.4.1. Impacts of Participation in Local Organization on Income and Food Security

Table 7 shows the effects of local organizational participation of the household on farm households' farm income generation of the sample households. The estimated result indicated that medium level of participation in the local

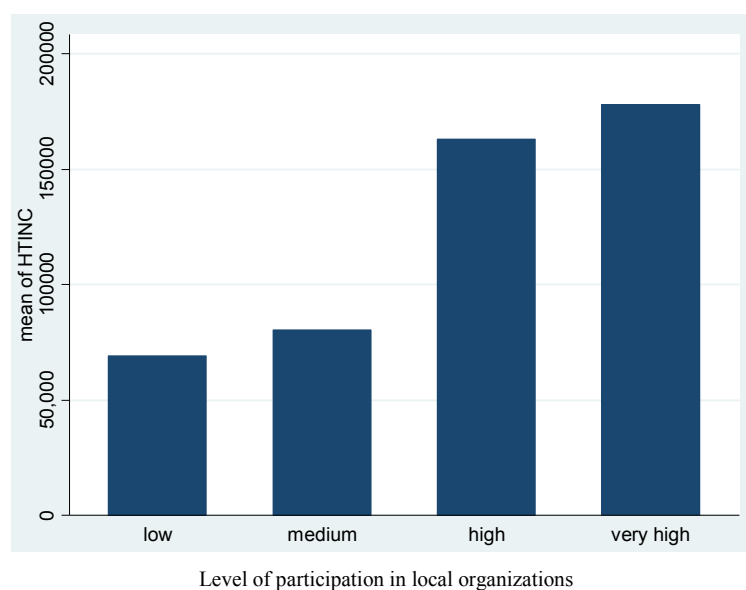
social organizations of the farm household not significantly increases farm household total income over that of low level participant households. However, high and very high level participation in the social local organization of the sample households increases the farm households total farm income by 46 and 65% respectively over low level participant households, and this difference is statistically significant at a 1% probability level (Table 7).

**Table 7.** Impacts of social capital on households' income.

Extents of participation	Ln income	S. E	Participation effects	S. E
Medium	10.536438	1.4811415	-.1374763	.1942744
High	11.130767	1.4705936	.4602642**	.2138724
very high	11.301804	1.4240823	.6527215***	.2153784

The following figure indicates the mean levels of farm households' farm income status measured in Ethiopian birr by

different extents of participation in the social organizations' of the farm households in the study area.



**Figure 1.** Total farm income across the extents of social organization participation.

Table 8 shows the effects of local organizational participation of the household on farm households' food security status of the sample households. The estimated result indicated that medium level of participation in the local social organizations of the farm household not significantly increases farm household food security status over that of low

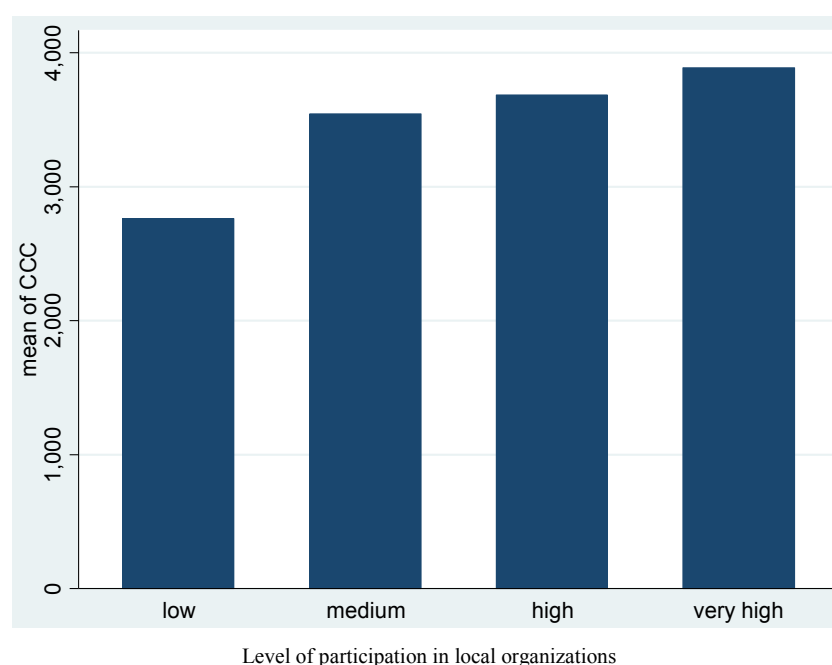
level participant households. However, high and very high level participation in the social local organization of the sample households increases the farm households' food security status by 33 and 38% respectively over low level participant households, and this difference is statistically significant at a 1% probability level (Table 8).

**Table 8.** Impacts of participation in social capital on farm food security status.

Extents of participation	Food security	S. E	M/D	Participation effects	S. E
Medium	3542.3712	1946.71	795.5681	.088659	.0884685
High	3687.6264	2394.85	963.62***	.3366536***	.0859743
very high	3888.7943	2022.93	1183.4***	.3812609***	.0886705

The following figure indicates the mean levels of farm households' food security status measured in food consumption score by different extents of participation in the

social organizations' of the farm households in the study area (Figure 2).



**Figure 2.** Food security across the extents of social organization participation.

### 3.4.2. Impacts of the Level of Trust on Farm Income and Food Security Status

Table 9 shows the effects of having different levels of social trust on farm households' farm income generation of the sample households. The estimated result indicated that having medium level of social trust in the community had not strong

correlation with the farm households' farm income generation status. However, having high level of social trust in the community significantly increases households' total farm income by 66 over low trusted farm households, and this difference is statistically significant at a 1% probability level (Table 9).

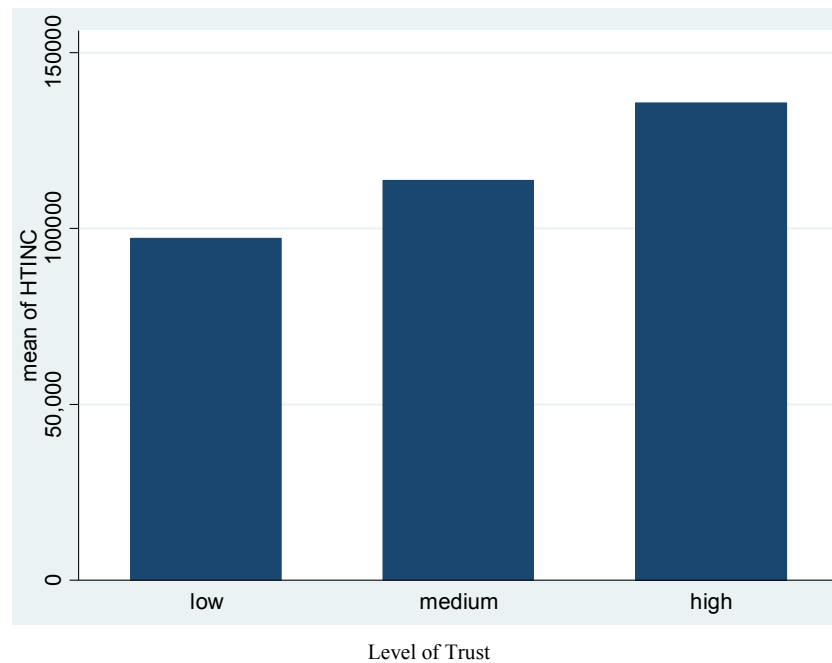
**Table 9.** Impacts of the level of community trust on farm income status.

Level of Trust	Ln income	S. E	Ln income effects	S. E
Medium	10.576927	1.4542157	.0445235	.2366138
High	11.249069	1.1257912	.660266***	.2297907

Sources: Own survey result, 2023. \*\*\* means significant at 1% probability levels

The following figure indicates the mean levels of farm households' farm income status measured in Ethiopian birr by

different extents of trust in the community of the farm households in the study area (figure 3).



**Figure 3.** Total farm income across the levels of community trust.

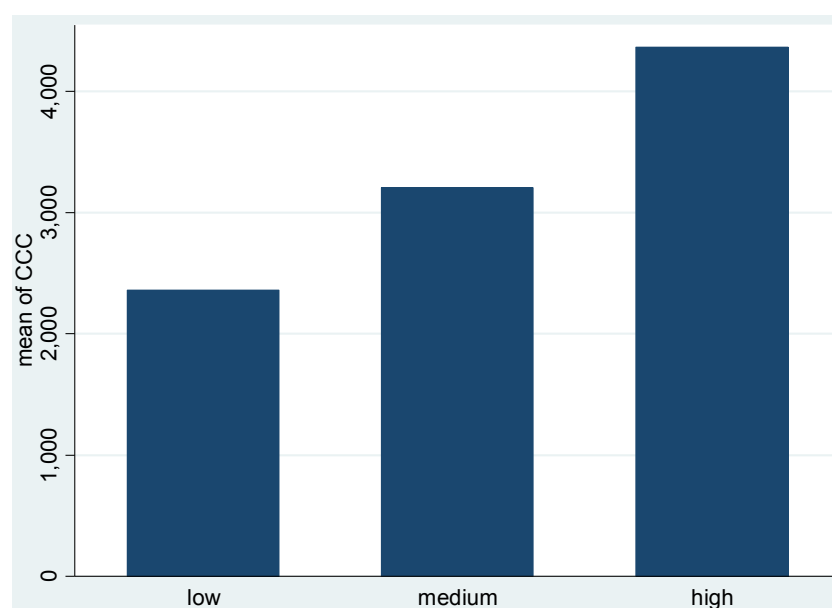
Table 10 shows the effects of having different levels of social trust on farm households' food security status of the sample households. The estimated result indicated that having medium and high level of social trust in the community had strong correlation with the farm households'

food security status. Accordingly, having medium and high level of social trust in the community significantly increases households' food security status by 23 and 46% over low trusted farm households, and this difference is statistically significant at a 1% probability level (Table 10).

**Table 10.** Impacts of the level of community trust on food security status.

Level of Trust	Kcalorie	S. E	M/d	Food security effects	S. E
Medium	3206.6538***	1833.145	1046.695	0.232441***	.0941027
High	4366.2979***	1925.7419	1764.3	.4577408***	.0859935

The following figure indicates the mean levels of farm households' food security status measured in food consumption score by different extents of trust in the community of the farm households in the study area (figure 4).



**Figure 4.** Food security across the levels of trust.

### 3.4.3. Effects of Participation in Social Capital on Livelihood Choice Strategies

The estimated results shows that medium and high level participation of the farm households in the local social organization did not show a significant effect on the farm households' livelihood choice strategies but higher level participation in the social organization had significant relationships with the farm households' livelihood choice strategies. Accordingly, very high level participation in the

local social organization increases the farm households livelihood diversification strategies by 40% over that of low participant households and significant at a 5% statistical levels. Likewise, having medium trust in the community did not show significant relationships with the farm households' livelihood diversification strategies. But having high levels of social trust in the community increases the farm households livelihood diversification strategies by 59% over that of low trusted household and significant at a 5% statistical levels.

**Table 11.** Effects of social capital of the households livelihood choice strategies.

Extents of participation	Participation effects	S. E	t-value
Medium	-.4601411	.1372554	-3.35
High	.1159812	.1915535	0.61
very high	.4050647**	.1589449	2.55
Levels of social trust			
Medium	.0223011	.2541687	0.09
High	.5894636**	.2436213	2.42

Sources: Own survey result, 2023. \*\* means significant at a 5% percent statistical levels

## 4. Conclusion

According to the estimated results, at a 1% probability level, households with high and very high levels of engagement in the social local organization of the sample households had total farm income that is 46 and 65% more than those with low levels of participation. Similarly, farm families have higher food security status than non-farm households when they participate at high and very high levels in the social local organization of the sample homes. This difference is statistically significant at a 1% probability level. Yet, at a 1% probability level, high levels of social trust in the community greatly enhance households' overall farm income by 66 over low levels of trust in farm households. Similar to the previous example, at a 1% probability level, having medium and high levels of social trust in the community considerably improves families' food security status by 23 and 46% over low trusted farm households.

Last but not least, the impact evaluation results of the mean comparison result demonstrate that very high level participation in the local social organization increases the farm households' strategies for diversifying their sources of income by 40% over those of low participant households, and is significant at a 5% statistical level. Also, there was no evidence of a connection between medium levels of community trust and the farm households' efforts to diversify their sources of income. Yet, compared to poorly trusted households, farm households' livelihood diversification techniques improve by 59% when there is high levels of social trust in the community, which is significant at a 5% statistical level.

## 5. Recommendation

This study has uncovered proof that a high degree of social capital, shown in involvement in a variety of local organizations

and community trust, as well as the diversification of livelihood options, will improve the food and nutrition security of farm households. The study also found that social capital levels have a favorable impact on the diversity of livelihood methods, which in turn enhances the food and nutrition security of farm households. This sends a positive message to those responsible for designing and implementing programs as well as funding sources, encouraging them to take the necessary steps to improve rural families' access to food and nutrition. After the study's findings, the following policy recommendations were made. The most significant factor affecting food and nutrition security at the family level was social capital status. As a result, enhancing household social capital and using it as a possible input for development programs has the potential to reduce food insecurity and enhance nutrition among smallholder farmers.

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