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Occupational Diversification and Its Impact on Nutritional and Food Security Outcomes in Developing Regions

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Abstract:
Occupational diversification has become a common feature of rural and peri-rural life across developing regions. Households combine farming with wage labor, trade, migration, services, and small enterprise in order to reduce risk and improve living standards. This article examines how such diversification affects nutritional and food security outcomes. It uses a structured narrative review of peer-reviewed studies and major reports to analyze the pathways between diversified livelihoods and household diets, calorie adequacy, micronutrient intake, dietary diversity, and selected child and adult nutrition indicators. The review shows that diversification can improve food security and nutrition through higher and more stable income, better market access, stronger purchasing power, and greater ability to invest in farm production, health, and care. It can also support women's economic agency and reduce seasonal gaps in food access. However, the effects are not uniform. Evidence on dietary diversity and food expenditure is generally more positive and immediate than evidence on anthropometric outcomes such as child stunting or adult body mass. Benefits depend on the quality of jobs, who controls the income, the time burden placed on women, local food prices, access to health and sanitation services, and the broader food environment. The review also highlights that market-oriented diversification can sometimes increase reliance on cheap processed foods and can create unequal gains within households. The article concludes that occupational diversification can improve nutrition and food security, but only when it is linked to decent work, inclusive markets, women's agency, and complementary investments in health, care, education, and social protection.

Keywords: Occupational diversification; nutrition; food security; dietary diversity; developing regions; rural livelihoods; women's empowerment

1. Introduction

Food security and nutrition are related but not identical. A household may avoid outright hunger and still consume a poor-quality diet that leads to micronutrient deficiency, child growth faltering, anemia, or rising overweight. This distinction is important in developing regions where many households have moved from chronic calorie scarcity toward more complex problems that include poor diet quality, unstable access to food, and uneven health and care conditions. The edition of The State of Food Security and Nutrition in the World highlights the continuing scale of hunger and food insecurity and stresses that high food price

inflation has weakened access to healthy diets. The Joint Child Malnutrition Estimates also report that progress toward global nutrition targets remains too slow in many countries. These patterns make it necessary to ask not only whether people have food, but what kinds of foods they can reliably obtain and use well (FAO et al., ; UNICEF, WHO, and World Bank,).

In many developing regions, households pursue nutritional security through a mix of occupations rather than through agriculture alone. Farmers sell labor, run small businesses, migrate temporarily, process food, operate transport services, work in public programs, or depend on remittances. Some diversify because farming is too risky or too small. Others diversify because roads, towns, value chains, and digital networks create new opportunities. Whatever the reason, these shifts alter how food enters the household. Food may come from own production, market purchase, employer meals, remittance-supported consumption, or public transfers. Income may arrive daily, weekly, seasonally, or unpredictably. Women's time for feeding and care may increase or decrease. Market exposure may widen access to diverse foods, but it may also increase dependence on ultra-processed items. Occupational diversification therefore shapes not just income levels but also the everyday food environment in which nutrition outcomes are produced (HLPE, 2017; IFAD).

A large body of research has examined links between agricultural production, income, market access, and diets. Yet the specific role of occupational diversification is sometimes hidden inside broader livelihood studies. This can give the mistaken impression that nutrition is mainly determined by what households grow on the farm. In reality, many rural households buy a substantial share of the foods that improve diet quality, including fruit, vegetables, eggs, milk, fish, and processed staples. Households also use non-farm income to pay for health care, sanitation, transport, school meals, and other supports that influence nutrition. At the same time, diversification can shift labor and care patterns in ways that are not always positive. The relationship is therefore complex. More income can improve diets, but only if food prices, care practices, health conditions, and decision-making power allow that income to be translated into better nourishment (Herforth and Harris, 2014; Ruel et al., 2018).

This article examines occupational diversification and its impact on nutritional and food security outcomes in developing regions. It asks five linked questions. First, through what mechanisms does diversification affect food and nutrition? Second, what does current evidence say about diets, food consumption, and nutrient intake? Third, what does the evidence say about child, maternal, and adult nutritional outcomes? Fourth, why do results differ across regions and social groups? Fifth, what policy approach is most likely to turn occupational diversification into improved nutrition rather than only short-term cash income? The article argues that diversification can be nutrition-enhancing, but only when it leads to stable and inclusive earnings, protects care time, strengthens women's agency, and is supported by health, sanitation, and market systems that make nutritious foods available and affordable.

2. Review Approach and Key Concepts

This article uses a structured narrative review rather than a formal systematic review. It draws on influential conceptual work on agriculture-nutrition pathways, peer-reviewed empirical studies from Africa and Asia, and recent flagship reports from international organizations. Preference was given to studies that examine household-level food security, dietary diversity, calorie adequacy, micronutrient intake, or anthropometric outcomes, and that speak clearly to the role of diversified livelihoods, non-farm income, women's empowerment, commercialization, or market access. Most of the strongest evidence comes from rural Sub-Saharan Africa and South Asia, with fewer household-level studies from Latin America and fragile states. The review therefore emphasizes patterns that appear repeatedly in the literature while also noting where evidence is mixed or still thin.

Several concepts must be kept separate. Food security refers broadly to access to sufficient, safe, and nutritious food over time. Nutrition outcomes include diet quality, nutrient adequacy,

child feeding practices, adult and child anthropometry, and related health outcomes. Dietary diversity is often used as a proxy for diet quality, but it does not capture everything about food quantity or nutrient absorption. Anthropometric outcomes such as stunting, wasting, or body mass index change more slowly and depend on disease, sanitation, health care, and care practices as well as food. Occupational diversification refers to households combining multiple activities, while commercialization refers more specifically to production for sale and stronger market orientation. The two often overlap, but they are not identical. A household can diversify without becoming highly commercialized, and it can commercialize one activity while remaining occupationally narrow in other respects.

3. From Food Security to Nutrition Outcomes

The first bridge between occupational diversification and nutrition is the distinction between food quantity and food quality. Historically, many food security discussions focused on calories and staple grain supply. That focus remains important where hunger is severe, but it is not enough. Diets can be adequate in calories yet deficient in protein, iron, zinc, vitamin A, or other micronutrients. They can also become high in sugar, salt, and unhealthy fats when cheap processed foods dominate local markets. HLPE's report on nutrition and food systems emphasizes that nutrition depends on the whole food system, from production and processing to distribution, marketing, preparation, and care. Occupational diversification matters because it can change a household's place within this system. It affects whether households consume mostly what they grow, mostly what they buy, or some shifting combination of the two (HLPE, 2017).

The second bridge is measurement. Studies of diversified livelihoods often use indicators such as the household dietary diversity score, women's dietary diversity, child dietary diversity, per capita calorie availability, food expenditure, or nutrient intake. These indicators capture short- to medium-term changes in what households can obtain and consume. By contrast, child stunting or adult body mass index respond more slowly and reflect cumulative conditions over time. This difference explains why occupational diversification may show clear positive effects on food expenditure or diet diversity while producing weaker or mixed effects on anthropometry. It is not that nutrition outcomes are unrelated to livelihoods. Rather, the pathway is longer and passes through health services, sanitation, disease exposure, maternal nutrition, feeding practices, and intra-household allocation. A nutrition-sensitive reading of diversification therefore requires patience and a broad lens (Ruel et al., 2018; Jones, 2017).

Agriculture-nutrition pathway frameworks are useful here. Herforth and Harris, and later Ruel and colleagues, identified several routes through which agriculture can influence nutrition: own-food production, income generation, food prices, women's empowerment, and effects on labor and care. Occupational diversification extends this framework beyond production itself. It includes not only what households grow, but also where they work, how they earn cash, when income arrives, who controls it, and what the local food market offers in return. In that sense, diversification is not a side topic. It is a practical way of thinking about how households combine multiple pathways into one nutritional outcome. A household may consume more eggs because it raised poultry, more vegetables because a woman trader can now buy them regularly, and more school meals because a migrant son's remittances pay school costs. Nutrition emerges from the combination, not from one channel alone (Herforth and Harris, 2014; Ruel et al., 2018).

Women's agency deserves special emphasis in this conceptual bridge. Evidence from empowerment research shows that who earns and controls income affects what foods are purchased and who consumes them. Women's decision-making power can influence meal frequency, diet diversity, child feeding, health care seeking, and spending on sanitation. But empowerment is not the same as work participation. Women can work long hours in agriculture or enterprise and still have little control over income or little time for care. Occupational

diversification may therefore improve nutrition only when it expands real agency rather than simply adding responsibilities. This insight is vital because many nutrition-sensitive programs talk about 'including women in markets' without addressing control over earnings, workload, or safety. Nutrition outcomes are shaped by these finer household dynamics (Sraboni et al., 2014; Quisumbing et al.).

Finally, there is the issue of stability. Good nutrition depends on continuity. A child who eats well after harvest but poorly during the lean season remains at risk. An adult who can afford protein foods only when remittances arrive may still face a nutritionally thin diet for much of the year. Occupational diversification can support nutrition precisely because it may stabilize income and consumption across seasons. Yet if extra activities are highly uncertain, dangerous, or poorly paid, the nutritional gains may vanish. This is why the concept of food security remains important even in nutrition analysis. Households need adequate diets, but they also need those diets to be regular, affordable, and resilient to shocks. Diversification can contribute to that stability, but only when livelihood portfolios are strong enough to support consistent access over time.

Table 1. Nutrition-related outcomes commonly used in the literature

Outcome	What it captures	Main limitation
Household dietary diversity score	Variety of food groups consumed at household level	Does not show quantities or individual allocation
Minimum dietary diversity for women	Diet quality linked to micronutrient adequacy for women	Covers only one group within the household
Child dietary diversity	Quality of complementary feeding for young children	Sensitive to recall period and season
Calorie adequacy	Whether energy intake is broadly sufficient	Can miss poor micronutrient quality
Micronutrient intake	Iron, zinc, vitamin A, protein, and other nutrient quality measures	More data-intensive and sensitive to measurement error
Anthropometry	Stunting, wasting, BMI, or other biological outcomes	Affected by health, sanitation, care, and long time lags

4. Main Mechanisms Linking Diversification to Nutrition and Food Security

The income pathway is the most obvious mechanism. Additional earnings from wage work, enterprise, migration, or processing increase the household budget available for food purchases. This is especially important for nutrient-rich foods that many poor households do not produce at home. When incomes rise in a reasonably stable way, households can buy a wider variety of foods, including perishables that improve diet quality. They can also maintain food purchases during the lean season rather than reducing meal size or relying only on low-cost staples. Babatunde and Qaim's study in Nigeria, for example, found positive effects of off-farm income on food security and nutrition. Similar findings appear in commercialization studies from Kenya, where higher cash earnings are linked to improved calorie and micronutrient consumption. The income pathway is therefore well supported, but it depends heavily on the regularity and adequacy of earnings (Babatunde and Qaim, 2010; Ogutu et al.).

A second mechanism works through own-production and farm investment. Occupational diversification can strengthen nutrition even when the new activity is not directly related to food purchase. Income from off-farm work may allow households to buy inputs, rent machinery, hire labor, irrigate, vaccinate livestock, or protect crops against losses. These investments can improve the quantity and diversity of foods available from the farm. They may also raise farm incomes, which then support further food purchases. In some households, non-farm income gives the flexibility needed to maintain home gardens, small livestock, or higher-value crops that would otherwise be too risky. In this way, diversification can support nutrition through a complementarity between cash income and production diversity. The point is not that households must produce every food they need, but that diversified earnings can make more nutrition-sensitive farming economically possible.

Market access is a third mechanism and often a decisive one. Studies from Malawi and broader reviews suggest that the nutritional gains from production diversity are often modest unless households can also sell produce and buy diverse foods in markets. Occupational diversification can improve this access directly when household members engage in trade, transport, food retail, or other market-linked work. Better market access reduces transaction costs, widens food choice, and allows households to rely less on narrow staple-based diets. Koppmair, Kassie, and Qaim found that access to markets for buying food and selling produce was more important for dietary diversity than farm production diversity alone. In the Sibhatu and Qaim meta-analysis, average effects of production diversity on diets were positive but small, especially relative to what better market access might deliver. These findings suggest that income and market connectivity often matter more for nutrition than simply producing more species on the farm (Koppmair et al., 2017; Sibhatu and Qaim, 2018).

Women's control over resources forms a fourth mechanism. Diversification can shift not only household income levels but also the internal balance of decision-making. When women obtain income from processing, trading, salaried work, or producer groups, they may gain more influence over purchases and child-related spending. Research from Bangladesh shows that women's empowerment in agriculture is associated with household calorie availability and dietary diversity, and later work links empowerment to dietary quality across the life course. These findings matter because many nutrition outcomes depend on intra-household allocation: who gets eggs, milk, or meat first, who receives health care quickly, and who decides what food is bought. Occupational diversification can therefore improve nutrition partly by altering bargaining power. But this effect is conditional. If women earn income but do not control it, or if added work reduces care time severely, nutrition gains may be smaller than expected (Sraboni et al., 2014; Sraboni et al., 2018).

A fifth mechanism concerns time use and care. Nutrition is not produced by food alone. It also depends on breastfeeding, child feeding frequency, meal preparation, hygiene, health care visits, and the time needed to shop, cook, and supervise eating. Occupational diversification can help by increasing income, but it can also hurt if it sharply reduces the time caregivers have available. This trade-off is especially relevant for women because new work is often added without reducing unpaid domestic labor. A mother who spends more hours trading or laboring may bring home more cash but have less time for preparing diverse meals or feeding young children. In this sense, time is a hidden nutrient pathway. Good diversification strategies either protect care time or provide substitutes, such as shared domestic work, school meals, prepared foods of acceptable quality, or community child care. Without such supports, income gains may not translate fully into better nutrition.

Health, water, and sanitation form a sixth mechanism. More diversified livelihoods may improve nutrition if the income they generate is used for clean water, soap, toilets, transport to clinics, medicine, or preventive health services. These expenditures can improve nutrient absorption and reduce disease burdens that undermine the nutritional value of food. This is one reason anthropometric outcomes are often more weakly linked to occupational diversification

than diet diversity is. A child may consume somewhat better foods but continue to face repeated infection or poor sanitation. The nutrition effect of diversification is therefore often mediated by non-food spending. In simple terms, earnings can help households buy food, but they can also help create the health conditions needed for the body to use that food well. This broader use of income is often overlooked when livelihood strategies are discussed only in terms of calories.

Stability across seasons and shocks is a seventh mechanism. Households that depend only on one crop or one labor source often experience sharp swings in food intake across the year. Diversification can reduce these swings by creating multiple entry points for cash or food. Remittances may arrive when harvest stocks are low. Petty trade may continue after a climate shock that damaged crops. Wage work may smooth food purchases when prices rise. This stabilizing role matters for nutrition because irregular diets are especially harmful for young children, pregnant women, and people already in poor health. Matsuura-Kannari and colleagues found that diversification in Bangladesh improved food expenditure under weather shocks, though gains were smaller for poorer households. The result underlines a broader point: nutrition security requires not just improvement on average, but protection against seasonal and climatic interruption (Matsuura-Kannari et al.).

Finally, diversification can affect nutrition through the local food environment, and this pathway can run in both directions. More cash and stronger market integration can widen access to fresh foods, animal-source foods, and convenience foods that save time. But they can also increase exposure to heavily processed products that are cheap, heavily marketed, and nutritionally weak. HLPE and other food systems analyses caution that income growth does not automatically create healthy diets. The content of local markets matters. A diversified livelihood that raises income in a village served mainly by refined grains, sweet drinks, and fried snacks may increase calories without much improvement in micronutrients. In more advanced stages of market transition, it can even contribute to overweight and diet-related disease. The nutrition effect of occupational diversification therefore depends not only on how much households earn, but on the nutritional quality, price, and convenience of the foods available for purchase (HLPE, 2017; FAO et al.).

Table 2. Main pathways from occupational diversification to nutrition and food security

Pathway	How nutrition may improve	Main trade-off or caution
Higher income	More regular purchase of diverse and nutrient-rich foods	Benefits weaken if earnings are low or unstable
Farm investment	Supports more productive or nutrition-sensitive farming	May not help if investment displaces needed food purchases
Market access	Expands food choice and lowers transaction costs	Local markets may still be dominated by poor-quality foods
Women's agency	Can improve spending on food, health, and child needs	Work without control over income may have limited effect
Time use and care	Income can support feeding and care if time is protected	Heavy workloads can reduce meal preparation and child care

Pathway	How nutrition may improve	Main trade-off or caution
Health and sanitation spending	Income can finance water, medicine, transport, and clinic visits	Health gains depend on service availability
Stability across seasons	Reduces lean-season hunger and diet interruption	Systemic shocks can still overwhelm multiple activities
Food environment	Market integration can improve access to fresh foods	It can also increase consumption of cheap processed foods

5. Evidence on Diets, Food Expenditure, and Nutrient Intake

Some of the clearest evidence on nutrition-related effects of diversification comes from studies of diet diversity. Jones, Shrinivas, and Bezner Kerr found in Malawi that farm production diversity was positively associated with household dietary diversity, especially for legumes, vegetables, and fruits. The study was important because it used nationally representative data and showed that more diverse production can matter for diets. Yet even this positive result came with nuance. The strength of the relationship differed across households and was stronger in some social groups than others. This reminds us that diversification on the farm is helpful but not universal in its effects. It interacts with wealth, market access, and social position. Production diversity may increase the foods directly available for consumption, but it does not by itself guarantee that households will obtain all the nutrient-rich foods they need (Jones et al., 2014).

Sibhatu, Krishna, and Qaim widened the evidence base by examining smallholder households in Indonesia, Kenya, Ethiopia, and Malawi. They found that production diversity was positively associated with dietary diversity in some situations, but not in all. In households that already had relatively high production diversity, adding still more crop or livestock species often did not improve diets and could even involve opportunity costs if it reduced gains from specialization and market exchange. This is a crucial lesson for occupational diversification more broadly. Nutrition does not always improve by maximizing variety in every activity. Sometimes households do better by keeping a workable degree of production diversity while using non-farm income and market purchases to fill nutritional gaps. In other words, the best diet strategy may be a smart balance between what is produced and what is bought (Sibhatu et al., 2015).

The later meta-analysis by Sibhatu and Qaim sharpened this point. Reviewing studies from 26 countries, they found that the average marginal effect of production diversity on dietary diversity was positive but small. Their conclusion was not that production diversity is irrelevant, but that it is not a universally powerful tool for improving nutrition in all settings. This finding has direct implications for occupational diversification. If farm diversity alone often has limited average effects, then non-farm income, market participation, and other livelihood channels become even more important for understanding nutrition outcomes. The meta-analysis also highlights the danger of simple policy messages. Encouraging households to add ever more production activities without improving roads, markets, and purchasing power may yield weak nutritional returns. Nutrition-sensitive livelihood policy must therefore look beyond the farm gate (Sibhatu and Qaim, 2018).

Malawi again provides useful evidence on the role of markets. Koppmair, Kassie, and Qaim found that access to markets for buying food and selling farm produce was more important for household, maternal, and child dietary diversity than farm production diversity alone. This result is highly relevant for occupational diversification because many diversified activities

improve precisely those forms of access. Transport, trade, wage labor in market towns, and enterprise earnings all strengthen a household's capacity to engage with markets. Where roads are poor or food markets are thin, households may rely more heavily on own production and thus face narrow diets. Where income and access improve together, households can obtain a broader range of foods. The implication is that occupational diversification often works for nutrition not because it replaces agriculture, but because it lowers the practical barriers between the household and a more diverse food basket (Koppmair et al., 2017).

Evidence from Ethiopia points in a similar direction, especially for children. Hirvonen and Hoddinott found that greater agricultural production diversity in rural Ethiopia was associated with more diverse diets for young children, but they also showed that this non-separability between production and consumption weakens when households have better access to food markets. This is an important reminder that nutritional pathways change with market conditions. In more isolated settings, what households grow may strongly shape what children eat. In better-connected settings, income and market access may matter more than on-farm diversity. Occupational diversification interacts with this pattern because it often changes the degree of market connectedness. A household with members engaged in transport or town-based work may face a very different nutrition opportunity set from an otherwise similar household that remains spatially isolated (Hirvonen and Hoddinott, 2017).

Commercialization studies offer another perspective. Ogutu, Godecke, and Qaim, using data from Kenya, found that stronger commercialization significantly improved household food security and dietary quality in terms of calories, zinc, and iron, although effects for vitamin A were not significant. Their analysis suggests that higher incomes from market-oriented farming increased nutrients from purchased foods without reducing nutrients from own-produced foods. This is an important result because it shows that market-based livelihood change can support nutrition if the income effect is strong and if purchased foods complement rather than displace useful home foods. Occupational diversification and commercialization are not identical, but they often overlap in practice. Many households diversify into transport, input supply, processing, and trade precisely because agriculture is becoming more market linked. The Kenyan evidence therefore speaks directly to how diversified and commercial rural livelihoods can affect nutrient intake (Ogutu et al.).

The Nigeria evidence from Babatunde and Qaim adds further support for the positive role of outside earnings. Their study showed that off-farm income improved food security and nutrition, indicating that even where production remains important, non-farm work can influence what households eat. This matters because many food security debates still assume that food outcomes are primarily determined by staple crop harvests. In reality, households use non-farm earnings to buy protein-rich foods, condiments, prepared items, and foods for special needs such as young children or sick adults. They may also use those earnings to stabilize consumption when prices rise or harvests fail. The value of diversification for nutrition therefore lies not only in average income growth, but in the flexibility it gives households to respond to shortfalls and changing needs in real time (Babatunde and Qaim, 2010).

Broader reviews of agriculture and nutrition help make sense of these empirical findings. Jones's 2017 critical review concluded that agricultural biodiversity often has a positive association with diet quality, but the strength of that association varies and evidence on anthropometric outcomes is far more mixed. Ruel, Quisumbing, and Balagamwala likewise argued that while agriculture can influence nutrition through several pathways, empirical evidence remains uneven and strongly dependent on context. Together these reviews point to a balanced interpretation: diversified livelihoods are most likely to improve food expenditure, food security, and dietary diversity in the short and medium term, while stronger nutrition effects require supportive conditions in care, health, sanitation, and empowerment. This helps explain why nutrition-sensitive livelihood policy must be multi-sectoral. Income is necessary, but it is rarely sufficient by itself (Jones, 2017; Ruel et al., 2018).

Table 3. Selected evidence from developing regions

Study and setting	Main finding	Main implication
Jones et al. (2014), Malawi	Farm production diversity was positively associated with household dietary diversity	Own-production diversity can matter, especially where diets are narrow
Sibhatu et al. (2015), four-country study	Production diversity improved diets in some contexts but not all	Diversification works differently across household and market settings
Koppmair et al. (2017), Malawi	Market access mattered more for dietary diversity than production diversity alone	Income and connectivity are often crucial for diet quality
Ogutu et al., Kenya	Commercialisation improved calories, zinc, and iron intake	Market-oriented income can raise nutrient intake if food purchases improve
Babatunde and Qaim (2010), Nigeria	Off-farm income improved food security and nutrition	Non-farm earnings can support better food access
Sraboni et al. (2014; 2018), Bangladesh	Women's empowerment was linked to stronger calorie availability, dietary diversity, and diet quality	Agency within the household shapes nutrition outcomes
Hirvonen and Hoddinott (2017), Ethiopia	Production diversity mattered more where food markets were weak	The nutrition role of diversification depends on market conditions

6. Evidence on Child, Maternal, and Adult Nutrition Outcomes

When the outcome shifts from diets and food expenditure to child growth or adult nutritional status, the evidence becomes more mixed. This is not surprising. Anthropometric outcomes reflect cumulative and interacting influences that include infection, prenatal health, sanitation, maternal nutrition, feeding practices, and repeated shocks. A diversified livelihood may improve food access without immediately changing a child's height-for-age or weight-for-height. This does not mean the livelihood change is unimportant; it means the pathway is longer and more fragile. Nutrition researchers have repeatedly warned against expecting quick anthropometric gains from income or agriculture interventions alone. Occupational diversification should therefore be evaluated with realistic expectations. It can strengthen the conditions for better nutrition, but it rarely acts as a stand-alone cure for undernutrition (Ruel et al., 2018; UNICEF, WHO, and World Bank).

Bangladesh offers some of the best evidence on how diversification-related pathways operate through women's empowerment. Sraboni, Malapit, Quisumbing, and Ahmed found that increases in women's empowerment in agriculture were positively associated with household calorie availability and dietary diversity. Later work on dietary quality across the life course found that women's empowerment was associated with better diets for adults and some positive links for young children, though the strength of the relationships varied by age and sex. These findings are important for occupational diversification because they show that the nutritional

effect of work and income depends on who gains power within the household. When women have stronger control over productive decisions and income, food security and diet quality often improve. Yet the same research also shows that improvements are not uniform for every household member, which underlines the need to consider intra-household allocation rather than treating the family as a single unit (Sraboni et al., 2014; Sraboni et al., 2018).

The Bangladesh evidence also illustrates a broader life-course issue. Young children, adolescents, adult women, and adult men do not all benefit from livelihood change in the same way. Some indicators respond more to maternal education or health services than to household income alone. Others respond strongly to women's bargaining power. This means that occupational diversification may improve the household food budget while leaving certain members relatively underserved. For nutrition policy, the implication is important. Programs that support diversified livelihoods should not assume that gains trickle down equally to all. Complementary measures such as nutrition counseling, school meals, maternal health services, and targeted support for young children remain essential if broader household income gains are to translate into equitable nutrition improvements.

Evidence from Timor-Leste points to similar complexities. Bonis-Profumo, Stacey, and Brimblecombe examined women's empowerment in agriculture, food production, and child and maternal dietary diversity. Their findings highlight that empowerment, production, and dietary outcomes are linked, but not in a simple linear way. Household food production and women's agency can matter for the diets of mothers and children, yet these relationships remain shaped by context, including food availability, social norms, and the details of what women are able to control. This reinforces a wider lesson from the diversification literature: activities that raise income or production do not automatically improve maternal or child nutrition unless they also improve agency, access, and daily feeding conditions. Nutrition outcomes sit at the intersection of livelihoods and care, not on one side alone (Bonis-Profumo et al.).

There is also a growing recognition that market-oriented livelihood change can produce nutritional downsides if food environments shift in unhealthy directions. Stronger commercialization or non-farm income may increase the consumption of refined cereals, fried snacks, sweet drinks, and other low-cost convenience foods. Such foods can reduce time pressure and satisfy energy needs, but they may not improve micronutrient adequacy and can contribute to rising overweight in some contexts. HLPE's food systems perspective is useful here because it reminds us that nutrition outcomes depend on the kinds of foods that markets make cheap, visible, and convenient. Occupational diversification can therefore support better nutrition or accelerate poor diet transitions depending on the local retail environment. This dual possibility is especially relevant in peri-urban zones and rapidly transforming rural regions where processed food markets expand faster than nutrition education and regulation (HLPE, 2017).

Another reason anthropometric effects are mixed is that households often use new income first to stabilize staples, repay debt, or meet urgent non-food costs rather than to buy the most nutrient-dense foods. From a household perspective, this is rational. School fees, medicine, rent, and transport are unavoidable. Nutritional improvement may therefore come slowly even after livelihood diversification starts to pay off. It may also appear first in meal regularity or reduced hunger before it shows up in diet diversity or child growth. Researchers and policymakers should be careful not to interpret this slow pattern as failure. Rather, it suggests that nutritional gains from diversification often follow stages: first protection against sharp food insecurity, then gradual improvement in diet composition, and only later possible changes in biological outcomes. Programs that support diversified livelihoods can accelerate this sequence if they also reduce non-food pressures through health coverage, sanitation, and social assistance.

Overall, the evidence on child, maternal, and adult nutrition outcomes points to a realistic middle ground. Occupational diversification does matter, but it tends to matter most clearly for

the determinants of nutrition rather than for every final outcome at once. It can improve food access, reduce lean-season hunger, increase purchase of micronutrient-rich foods, and strengthen women's agency. These are meaningful achievements. But persistent stunting, wasting, anemia, and rising overweight also reflect structural problems in health systems, sanitation, education, and food environments. The nutritional effect of diversification is therefore significant but partial. It works best when embedded in a wider package of services and rights that allow households to turn improved livelihoods into sustained human well-being.

7. Regional Patterns and Heterogeneity

Sub-Saharan Africa accounts for much of the published household-level evidence on diversification, diet diversity, and market access. This region includes many rural households with small landholdings, limited irrigation, heavy reliance on rain-fed production, and rapidly growing connections to small towns. In such settings, diversified livelihoods often make the difference between seasonal subsistence and cash-based food access. Studies from Malawi, Nigeria, Kenya, Ethiopia, and cross-country African datasets suggest that diversification can improve dietary diversity and food security, but the magnitude depends heavily on infrastructure, enterprise conditions, and the quality of local markets. The African evidence also shows that many households are not leaving agriculture entirely; rather, they are combining it with labor, trade, and small enterprise. Nutrition outcomes therefore emerge from mixed rural economies rather than from isolated farm systems (Davis et al., 2017; Koppmair et al., 2017; Ogutu et al.).

South Asia presents a somewhat different pattern. Land fragmentation, dense populations, circular migration, and strong social hierarchies often shape livelihood diversification. Agriculture remains vital, but wage labor, migration, public employment, services, and small trade play a major role in supporting household consumption. The region also continues to face high levels of child undernutrition despite economic growth, which has led researchers to emphasize pathways beyond food supply alone. Kadiyala and colleagues, in mapping evidence from India, showed that nutrition depends on a wide set of routes involving income, women's status, maternal health, care, and sanitation. In this context, occupational diversification can improve diets and food security, but its benefits depend strongly on who migrates, who controls earnings, and whether women gain or lose time and agency. The South Asian case therefore highlights the centrality of social relations in translating livelihoods into nutrition (Kadiyala et al., 2014; IFAD,).

A third pattern concerns market integration. In more isolated regions, own production and local ecological diversity can strongly influence diets because markets are thin, transport is weak, and food choice is narrow. In better-connected regions, the relationship changes. Households can specialize more and still maintain diverse diets if they have income and access to food markets. This is why production diversity appears strongly linked to diets in some studies and only weakly linked in others. The difference often lies in the surrounding food system rather than in the household alone. Occupational diversification is part of this story because it often reflects and accelerates integration into markets. A household engaged in transport or town-based wage work is differently positioned from a household reliant almost entirely on local exchange. The nutritional consequences of diversification must therefore be interpreted in relation to market access, not in abstraction from it (Hirvonen and Hoddinott, 2017; Jones, 2017; Sibhatu and Qaim, 2018).

Gender differences also produce strong heterogeneity across regions. In some settings, women gain from diversification through trading, processing, or salaried work that increases agency and spending on food. In others, the same activities increase workloads while leaving control over income largely unchanged. Life-course patterns matter as well. Adults may benefit first from diversified earnings, while young children depend more on feeding practices and sanitation. Adolescents may be affected by bias in intra-household food allocation. These

differences help explain why household dietary diversity can improve while child nutrition moves only slowly. Averages at household level often hide these internal variations. Nutrition-sensitive diversification policy must therefore be attentive to who benefits, who works more, and who still lacks voice in food decisions (Sraboni et al., 2018; Quisumbing et al.).

There is also heterogeneity by wealth and asset position. Better-off households often diversify from a platform of land, education, savings, and social connections. They are more able to enter high-return enterprise, safer migration, or formal employment. Poorer households may diversify into irregular labor and low-margin trade. The result is that similar diversification rates can correspond to very different nutritional outcomes. A household with a productive farm and a stable teaching salary may experience strong improvements in diet quality, while a land-poor household relying on intermittent wage labor may see only small changes in food intake. This distinction is especially important for interpreting cross-sectional studies. Diversification is not self-explanatory. The nutritional meaning of diversification depends on whether it is linked to accumulation, coping, or crisis survival (Barrett et al., 2001; Loison, 2015).

Taken together, regional differences do not undermine the basic argument of this article. They refine it. Occupational diversification tends to improve food security and often supports better diets, but its nutritional effect is mediated by infrastructure, market development, women's agency, social stratification, and the prevalence of disease and poor sanitation. The same livelihood strategy can therefore deliver different outcomes in Malawi, Bangladesh, Ethiopia, or Timor-Leste. Recognizing this heterogeneity is not a weakness. It is a condition for serious policy design. Nutrition gains will remain modest if programs copy a diversification model from one place to another without asking how local food systems, labor markets, and household power relations differ.

8. When Diversification Improves Nutrition, and When It Does Not

Occupational diversification is most likely to improve nutrition when the added activity provides earnings that are regular enough to influence daily and weekly food choices. A one-time windfall may cover debts, but steady earnings are what allow households to buy eggs, vegetables, milk, fruit, pulses, and school meals consistently. Stability matters more than headline income alone because nutrition depends on repeated purchase and regular meal patterns. This is one reason why small but predictable enterprise income can sometimes support nutrition more effectively than larger but uncertain seasonal returns. It also explains why social protection and wage reliability are so important for nutrition-sensitive livelihoods. They make income usable for feeding decisions rather than reserving it only for emergencies.

Diversification also tends to help when it is combined with reasonable market access and a healthy food environment. If households can reach markets where diverse foods are available at affordable prices, extra income can quickly translate into more varied diets. If the local market mainly offers refined staples, sweet drinks, and cheap fried snacks, the nutritional return to extra income will be weaker and may even turn negative in the long term. This means that nutrition-sensitive livelihood policy must pay attention to both sides of the market: household purchasing power and the quality of what is for sale. Support for storage, cold chains, local retail of fresh foods, and food safety can therefore be as important as support for household earnings themselves.

Women's agency is another condition that strongly shapes whether diversification helps. When women can decide how income is used, dietary gains are often stronger. When they cannot, additional earnings may be diverted to non-food uses or distributed unequally across household members. At the same time, increasing women's paid work without reducing unpaid labor can create time poverty, which limits meal preparation, breastfeeding, and care. The practical lesson is that diversification helps nutrition most when it is accompanied by changes in labor allocation, child care arrangements, labor-saving technologies, and social norms around

decision-making. In other words, good nutrition outcomes require both income and the household conditions needed to use that income well.

Diversification is less likely to improve nutrition when households enter low-paid, unstable, or hazardous activities. In such cases, extra work may simply compensate for failing farm incomes without generating a meaningful surplus for better diets. Unsafe migration, debt-financed enterprise, or irregular casual labor can even worsen stress and reduce food security if expected income does not materialize. Similarly, if diversification pulls labor away from own-food production without generating adequate replacement income, households may become more dependent on food purchases they cannot sustain. These risks are especially high for poorer households that diversify under pressure. The nutrition effect of diversification is therefore closely tied to the quality of available jobs and the terms on which households enter them.

Another failure point appears when the benefits of diversification are highly unequal within the household. Adult earners may improve their own diets while young children, adolescent girls, or older relatives benefit little. Such patterns can occur when food allocation is biased, when time for child feeding declines, or when new income is controlled by one decision maker. Studies on women's empowerment and dietary quality across the life course show clearly that nutrition gains can differ by age and sex. This means that household-level food security indicators should be interpreted carefully. They may show improvement even when nutritionally vulnerable individuals remain at risk. Better monitoring therefore requires a more disaggregated view of outcomes.

Finally, diversification may fail to deliver strong nutrition outcomes when it is expected to compensate for absent public services. Income can buy food, but it cannot fully substitute for clean water, sanitation, primary health care, maternal services, and effective nutrition counseling. Where these services are weak, households may improve their diets somewhat while still suffering from infection, poor absorption, and repeated nutritional setbacks. The strongest conclusion from the literature is therefore not that diversification is overrated, but that it works best in combination with other supports. Nutrition is produced through linked systems. Livelihood change is one piece of the answer, not the whole answer.

An additional factor is sequencing. Households often use new income first to secure staple foods and reduce immediate hunger before they invest in more diverse and often more expensive foods. From a nutritional perspective, this means that an intervention may succeed in its first stage even when the menu does not yet look ideal. Protecting calorie intake during lean periods or during inflation is itself an important achievement. Over time, as income becomes more reliable and debts fall, households may shift spending toward animal-source foods, fruits, vegetables, and better-quality staples. Evaluations that look too early can therefore underestimate the full nutritional value of diversification. They may observe small diet changes and conclude that livelihoods do not matter, when in fact households are moving through a realistic sequence from crisis management to gradual dietary improvement.

Secondary towns deserve more attention in this sequence. Many diversified rural livelihoods are connected not to large cities but to nearby towns where food is traded, processed, stored, and sold. These towns create demand for transport, milling, retail, packaging, catering, and casual services. They also shape what foods circulate back into villages. If secondary towns develop strong markets for nutritious foods, rural households may benefit both as sellers and as consumers. If they become dominated by shelf-stable processed products, nutrition gains may be weaker. Occupational diversification is therefore linked not just to household behavior but to territorial change. A nutrition-sensitive strategy should see villages and small towns as one connected food and labor system rather than as separate spaces.

Adolescent and maternal nutrition also deserve more focused treatment than they often receive. Diversified livelihoods can improve household food security while still leaving adolescent girls with restricted diets or pregnant women with heavy workloads and inadequate rest. These gaps matter because adolescence and pregnancy are critical periods with long-term effects on health

and child development. Income alone may not protect these groups if social norms favor adult men in food allocation or if women continue to combine paid work with physically demanding domestic labor. Nutrition-sensitive diversification must therefore include targeted services such as iron supplementation, maternal care, school feeding, reproductive health support, and social norm change. Without these measures, some of the household members most in need of nutritional improvement may benefit the least.

Food price inflation adds a final layer of complexity. Even where households diversify successfully, rapid increases in the price of eggs, milk, vegetables, pulses, and transport can erase much of the purchasing power gained from new work. Recent global reporting has emphasized how inflation has undermined access to healthy diets, especially for low-income populations. This means that the nutritional value of diversification depends partly on the broader price environment. A household may be more diversified in than it was in and still struggle to buy the same quality of food if inflation is high. Nutrition-sensitive policy must therefore combine livelihood support with measures that stabilize food markets, reduce transport costs, and protect poor consumers from price shocks (FAO et al.).

9. Policy Framework for Nutrition-Sensitive Diversification

A useful policy framework begins with a simple principle: support diversified livelihoods in ways that explicitly improve diets, care, and health rather than assuming these gains will appear automatically. This means linking rural employment and enterprise policy with nutrition goals from the start. Agricultural extension can promote not only productivity but also nutrient-sensitive production choices. Rural enterprise support can prioritize food processing, storage, cold chains, transport, local retail, and services that expand the availability of diverse foods. Public employment programs can be timed to lean seasons and linked to nutrition messaging or local food procurement. The point is to design diversification so that it strengthens the food system around poor households, not merely their cash earnings in isolation (HLPE, 2017; IFAD).

Infrastructure remains central. Roads, electricity, mobile connectivity, irrigation, and market facilities influence both livelihoods and diets. Good roads reduce the cost of moving perishable foods and widen labor options. Electricity supports refrigeration, food processing, and safer retail. Digital connectivity can improve access to prices, employment information, cash transfers, and nutrition information. Without these public goods, households often diversify into low-return activities and face thin food markets. With them, the same households can connect to more dynamic value chains and purchase more diverse foods at lower transaction cost. Infrastructure is therefore a nutrition intervention in an indirect but powerful sense: it reshapes the opportunity structure through which occupational diversification affects food security.

A second pillar is gender-responsive support. Programs should expand women's access to land documentation, savings groups, credit, training, safe transport, and producer organizations. Equally important, they should reduce time poverty through labor-saving technologies, clean energy, water access, and child care support. Nutrition gains are more likely when women can participate in remunerative activities without sacrificing care and when they can retain control over part of the resulting income. Nutrition counseling and social behavior change efforts should involve men as well, because redistribution of domestic work and decision-making is often necessary if diversified livelihoods are to benefit children and women nutritionally. Gender-responsive diversification is therefore not a niche add-on; it is central to whether nutrition outcomes improve (Sraboni et al., 2014; Quisumbing et al.).

A third pillar is social protection and health system support. Cash transfers, school feeding, maternal nutrition services, community health workers, crop and livestock insurance, and shock-responsive safety nets can all strengthen the nutritional impact of occupational diversification. They reduce the need for households to use all additional income for emergency

stabilization and allow some of it to support better diets. They also protect vulnerable household members during periods when diversification income falls. Health and sanitation services are especially important because they improve the body's ability to use food. In policy terms, this means that livelihood support and nutrition services should not sit in separate silos. They are complementary investments that work far better together than apart.

Finally, governments and development agencies need better data systems for nutrition-sensitive livelihood planning. Monitoring should move beyond household income and ask whether diets are becoming more diverse, whether women and children benefit, whether lean-season gaps are closing, and whether food environments are improving or becoming more processed and unequal. This calls for combining employment and enterprise surveys with diet indicators, food price data, women's empowerment measures, and seasonal tracking. Better data would help distinguish forms of diversification that support good nutrition from those that only increase workload or dependence on poor-quality foods. Good policy is not simply about encouraging households to diversify. It is about guiding diversification toward pathways that make healthy diets more affordable, more regular, and more equitable.

10. Future Research and Conclusion

Future research should do three things better. First, it should follow households over time so that changes in livelihoods can be linked to seasonal food security, diet quality, and longer-term nutrition outcomes. Second, it should use more individual-level nutrition indicators, because household-level averages can hide important differences by age and gender. Third, it should pay more attention to job quality, care time, migration conditions, and the nutritional content of local food environments. These factors are often treated as side issues, yet they are central to whether occupational diversification improves nutrition or merely shifts households from one vulnerability to another. Better evidence is also needed from under-studied regions, especially fragile and conflict-affected areas, where diversification may be both more necessary and more difficult.

The evidence reviewed in this article supports a clear conclusion: occupational diversification can improve food security and can contribute meaningfully to better nutrition outcomes in developing regions. It tends to do so first through higher and more stable income, better market access, and stronger ability to purchase diverse foods. It can also improve nutrition through farm investment, reduced seasonal gaps, and enhanced women's agency. These are important pathways, and the empirical literature on diet diversity, food expenditure, and nutrient intake provides substantial support for them.

At the same time, the nutritional effects of diversification are neither automatic nor uniform. Diet diversity may improve without large short-term changes in child growth. More income may coexist with poor sanitation or with rising purchases of unhealthy processed foods. Women may earn more while carrying heavier time burdens. Poor households may diversify into activities too fragile to support lasting nutritional gains. These mixed outcomes do not weaken the relevance of diversification. They show that nutrition is shaped by a chain of conditions, and livelihood change is only one part of that chain.

The policy implication is therefore straightforward. Occupational diversification should be supported, but it should be supported in a nutrition-sensitive way. That means pairing livelihood opportunities with healthy food environments, women's agency, health and sanitation services, social protection, and better public infrastructure. When these conditions are in place, diversification can do more than raise cash incomes. It can help households secure safer, more stable, and more nutritious diets over time. In developing regions where rural and peri-rural households must manage multiple risks at once, that combination of resilience and nutritional improvement is one of the most important development goals of all.

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