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Stakeholder Growth Platforms for the Development of Food Sector Small to Medium Enterprises (SMEs): A case study experience from Wales, United Kingdom

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Received July 2023, accepted November 2023, available online January 2024

ABSTRACT

Project HELIX 2016-2020 was developed and implemented in Wales, to improve technical and safety/science knowledge; and sustainable innovation in food manufacturing small to medium enterprises (SMEs). The paper aims to place Project HELIX within the wider context of regional and food sector development and then examine the project's rationale and delivery methods relative to this. It reflects on the effectiveness of the project (or otherwise) in constructing regional advantage from knowledge transfer and knowledge spillovers. Finally, the paper identifies areas of further research both in terms of the firm level and in relation to other food sector initiatives more generally.

Keywords: Growth platforms; triple helix; constructing regional advantage; food sector; food manufacturing.

1 Introduction and Background

The triple helix model (Etzkowitz, 2008) was determined as a tool for Regional Innovation Systems (RIS) (Asheim *et al.*, 2019; Cooke 1992; Asheim and Isaksen 1997; Tödtling and Kaufman, 1999), with RISs being projected to continue as a strategic role for a region's innovation and competitiveness (Asheim *et al.*, 2019). However, as a result of increased globalisation and technological advancement, RISs were determined as needing to be strengthened and integrated into a platform philosophy for regional development, as part of the tripartite platform theory of constructed regional advantage (CRA). This was deemed as being more flexible in relevance to the dynamics of policy and public sector support than the narrow definitions of pure RISs within a globalised economy (Cooke, 2007). The concept of platforms for developing a constructed regional advantage (CRA) was proposed by Cooke (2007) as being a stakeholder platform of a triple helix formation of university, government and industry for knowledge transfer, an industry platform for related variety among differing sectors for knowledge spillovers, and a policy platform for vertical and lateral knowledge spillovers. Such a stakeholder platform, Project HELIX (HELIX) 2016-2020, was initiated as a food sector intervention for food and drink manufacturing and processing (FDMP) small to medium enterprises (SMEs). It was funded by the Welsh Government from the European Agricultural Fund for Rural Development (EARDF) Rural Communities – Rural Development Programme 2014-2020 (Senedd Wales, 2015) and led by the ZERO2Five Food Industry Centre, being specifically developed and designed to improve technical, food science/safety skills and innovation. This case study will determine the extent to which the HELIX intervention, as a strategic stakeholder growth platform, acted effectively within the CRA paradigm, (Figure 1) from an analysis of its practical activities.

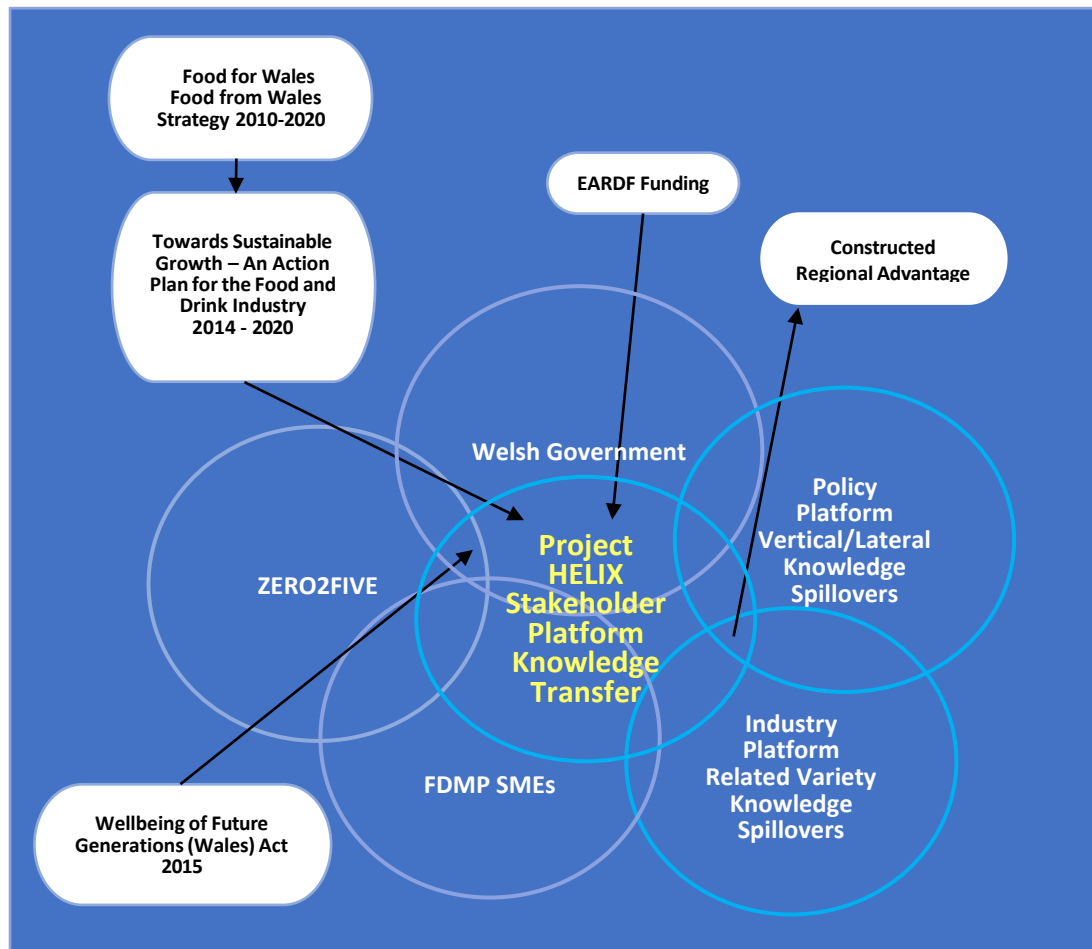


Figure 1. Project HELIX 2008 to 2020, as a strategic stakeholder platform within CRA.
(Source: Own Elaboration)

The rest of the manuscript has the following formation. The next two sections detail the study area and its food manufacturing and processing background. It progresses to the subject literature, identifying the strategic use of platforms to obtain business growth; in particular, the platform development being externally stakeholder driven

rather than internally SME driven; leading to its usage for regional development. It continues with the approach used to obtain data, analysis methods are then presented, followed by the results and discussion of the findings. Lastly, the conclusions detail the policy implications of strategic stakeholder platforms for the food sector, and an outline for further research suggestions are provided.

2 The study area

The study area, Wales, a devolved nation of the United Kingdom (UK), maintains an interesting yet disparate economy set against a backdrop of a territorial topology that consists of; rural lowland and upland areas with sparser populations, spatial businesses and higher education institutions (HEIs); coupled with urban old heavy industrial areas with dense populations and close, diverse businesses located in near proximity to HEIs. This topological mix and differing regional economic history determined the available resources, options and probable outcomes of policy actions for CRA (Asheim *et al.*, 2011; Lambooy and Boschma, 2001) designed for economic growth.

In determining economic performance, the Gross Added Value (GVA¹) (£) per head for Wales had consistently lagged behind the three other nations that made up the UK. Whilst it made an incremental year-on-year growth from 2010 onwards, the overall performance was lower than its UK counterparts, see Figure 2.

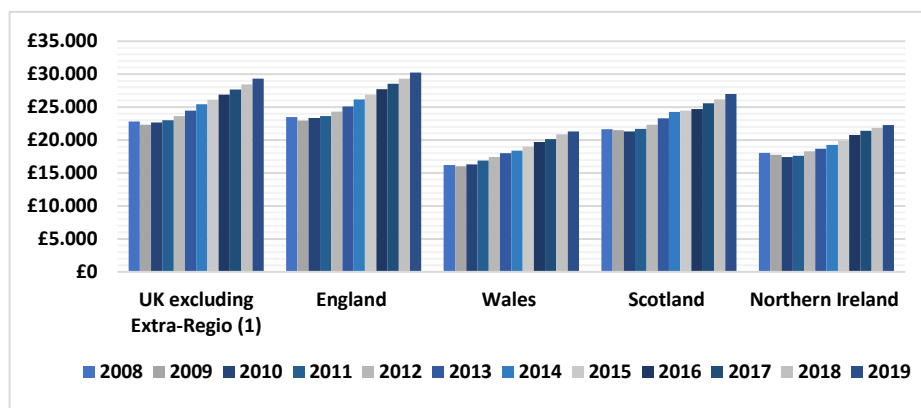


Figure 2. UK National Gross Value Added (£ per head) by UK nation and year, 2008 – 2019.
(Source: Office for National Statistics, 2022a)

Within Wales, the sub-regional GVA (£ per head) also exhibited an unequal delineation. The more affluent city regions of Swansea, Monmouthshire and Newport, Cardiff and the Vale of Glamorgan consistently performed higher than the old industrial urban areas of the southern Valleys and rural regions such as Powys and the Isle of Anglesey, see Figure 3.

In 2014, the Welsh Government detailed that Wales faced a variety of economic, social and environmental challenges including rising costs and increased competition impacting businesses, with increasing demands on public sector resources and energy security. Their policy was to increment business competitiveness, develop employment and create new delivery solutions via the catalyst of greater levels of innovation to include social innovation as a move from the traditional technology-based approach (Innovation Wales, 2014). This was pertinent at the time when between 2013 and 2014, Wales had the highest unemployment rates in the UK, (Office for National Statistic, 2022c), a ‘persistent gap in prosperity’, and challenging socioeconomic circumstances (Mayho *et al.*, 2023b; Henderson, 2019; Jones *et al.*, 2020).

Whilst the old urban industrial areas had traditionally contributed to the economy from their coal and steel products, more recently, the service industry superseded this (Mayho *et al.*, 2003b; Henderson, 2019). In terms of the rural regions, Wales’s geographical climate restricted food production outputs in parts to being mainly dairy, beef and lamb products, forming the primary food exports; with all food exports being £550m in 2019, equating to 4.1% of total exports (Food and Drink Wales, 2020). Imports strongly correlate with current contemporary consumer tastes and diets. The European Commission, of which the UK was a member state between 1973 and 2020, (European Union, 2023) identified Europe as being competitively disadvantaged in its value of food exports when benchmarked against countries such as Canada, Brazil, Australia and the United States of America, despite it being the largest volume exporter of food than the same countries. Europe had a slower growth in value added to products and export volumes, partly because 50% of its food sector consisted of SMEs (European Commission, 2007; Mayho *et al.*, 2023a).

¹ GVA is defined as “the difference between the value of goods and services produced and the cost of raw materials and other inputs which are used up in production” (Stokes, 2008).

As for Wales, 14.3% of the food and farming sector businesses were currently defined as SMEs (employing fewer than 250 people) with a further 85.4% categorised as micro businesses (employing fewer than 10 people) (Food and Drink Economic Appraisal, 2020).

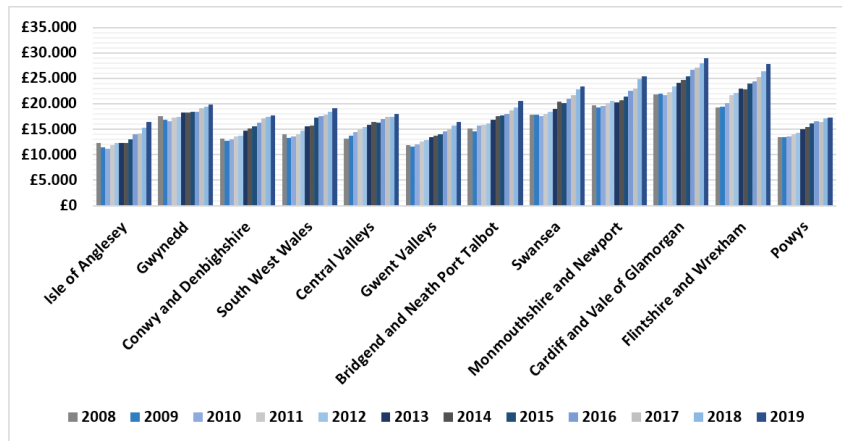


Figure 3. Wales Regional Gross Value Added (£ per head) by area and year, 2008 – 2019
(Source: Office for National Statistics, 2022b)

2.1 Background to food manufacturing and processing in Wales

The Welsh Government's 2006 Economic Research Advisory Panel recorded the nation's food manufacturing as experiencing a growth trend where cumulatively, the Welsh food and drink sector was reported as starting to make a "significant contribution to the Welsh economy" with food manufacturing contributing £679 million to the labour productivity GVA (Welsh Government, 2008). Yet, at the same time, Welsh FDMP SMEs' gross profit margins averaged only 3% (Bradley and Hill, 2016). In 2007 the Welsh Government pledged business development and active support to encourage small and medium enterprises (SMEs) to thrive in a positive climate (Welsh Government, 2007). However, Finance Wales, the Welsh Government's appointed body to deliver SME debt finance to boost business growth, reported problems with SMEs raising debt finance, citing increased costs and overdraft/loan finance being refused in the aftermath of the Global Financial Crisis (GFC) and the collapse of Lehman Brothers in September 2008 (Harrison and Baldock, 2015). The resulting economic recession also saw trade implications for SMEs, already vulnerable to financial constraints with shortages to finance being perceived as barriers to SME growth, even in the small firms that had the objective to grow (Jones-Evans, 2015; Harrison and Baldock, 2015). Additional constraints were identified in the form of skills shortages, coupled with a reluctance of SMEs to employ costly graduates and a lack of management time (ACOST, 1990; DTI, 1991; Smallbourne *et al.*, 1995; O'Gorman 2001; Collinson and Quinn; 2002). Mather (2005) also recognised the further financial challenges that FDMP SMEs specifically faced from the power of leading retailers putting competitive pressure on proffered food suppliers competing for valuable shelf space and their move towards traceable systems of quality and food safety. Meeting international safety and quality standards, such as Hazard Analysis Critical Control Points (HACCP) (HACCP, 2017) and Brand Reputation through Compliance Global Standards (BRCGS) (BRCGS, 2007), involved significant investment for FDMP SMEs, with additional expenses of employing technically proficient staff that required new resources and strategies (Mather, 2005). Without these critical technical skills, Welsh FDMP SMEs had limited ability to meet the increasing demands of large retail chains with their intensifying stringent requirements for volume, quality and food safety that reportedly impinged on the 'growth trajectory' of food sector SMEs (Mather, 2005). The key food quality and technical/safety skills landscape was continually evolving against a backdrop of drivers as seen in Figure 4.

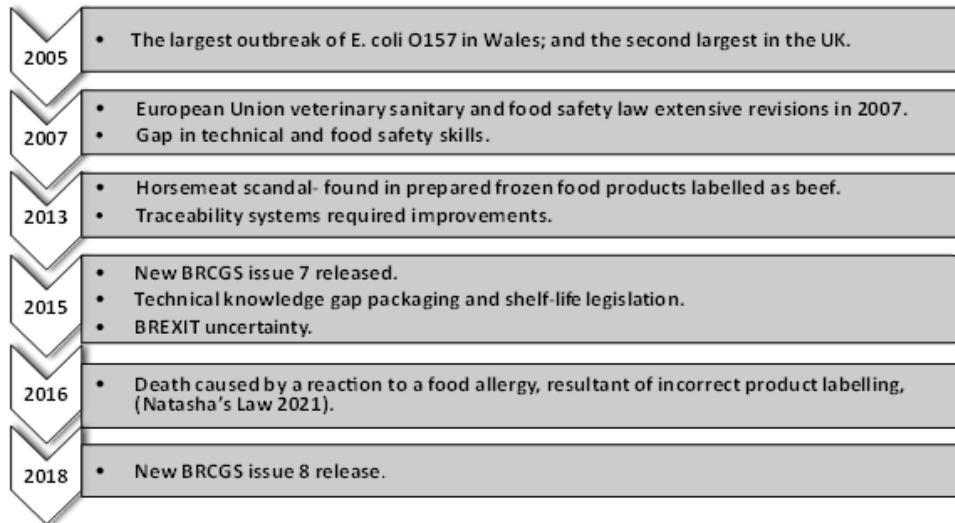


Figure 4. Predominant technical skills drivers (Source: Own elaboration)

A significant implication for the food industry was the 2007 revisions to the European Union veterinary sanitary and food safety law (Bondoc, 2016). However, more drivers were on the horizon, such as the BRCGS 7 quality standard and a further skills gap in food packaging and safety. The looming uncertainty around BREXIT was also dominant for FDMP SMEs (Ellis *et al.* 2017), particularly regarding exports which had increased by £147m between 1999 and 2013, by when 92% of these exports were supplied to the European Union (EU). By 2014, the food and drink sector played a key part in the economy of Wales, amassing a £16.8 billion turnover, and generating £264m in exports for the year (Warren-Thomas and Henderson, 2017). BREXIT uncertainty also affected employment numbers where between 2014 and 2017 the food supply chain had realised a >9% reduction in employment numbers i.e., circa 19,540 people (Food and Drink Economic Appraisal, 2020). Moreover, as the food and drink sector had links to other manufacturing and service sectors, any negative impacts will have a direct and indirect GVA% multiplier effect, associated with FDMP inputs and outputs. Multiplier effects were determined by Domański and Krzysztof (2010) as where increases or decreases in one type of economic activity in a given place or region induce an increase or decrease in demand for goods and services, in the same place or region. Thus, this study aimed to identify where HELIX was effective (or lesser so) as a strategic stakeholder triple helix platform food sector intervention for growth, innovation and competitiveness. It will use lessons learnt from the findings to determine how such a strategy is influential for CRA and where it, as a development approach, can be improved for future policy.

3.0 Growth platforms

In determining the theoretical constructs for growth platforms, the literature suggests that there are multiple ways for firms to obtain growth. Firstly, acquisition from buyouts is a strategy employed by many organisations, however, it is a concept rejected by Laurie *et al.* (2006) as an inhibitor of “external growth” from “squeezed out” funds and that “65% of acquisitions have destroyed more value than they create”. Another method is strategic diversification into new or niche markets to avoid product obsolescence (Ansoff, 1958; Di Stefano *et al.*, 2012; Verhoeven and Johnson, 2017). Alternatively, organisations can employ the use of platform strategies for growth, where the platform is defined as the mobilisation of a network to expand into and operate in a given market (Parker and Van Alstyne, 2016). Moreover, Laurie *et al.* (2006) proposed that an organisation able to provide new products and capabilities to new domains, via its own new growth platform (NGP), would achieve growth and that NGPS arise when ‘chance’ occurs such as social pressures or regulatory environments, likened to those experienced by Welsh FDMP SMEs, whereby in 2012, 83% were still only supplying the general public rather than leading retailers (Welsh Government, 2013). Yet, Meyer and Mugg (2001) commented that financial growth was gained from current as well as new markets and a company creating a new growth platform for new markets, whilst increasing profitability and growth, would nevertheless incur an expense. FDMP SMEs with the inability to raise finance, such as those reported by Finance Wales (Harrison and Baldock, 2015) would find the lack of resources to invest in NGPs an inhibitor to company growth. However, Laurie *et al.* (2006) suggested that all companies grew by creating new growth platforms (NGPS) on which they could build a family of products services and businesses and extend their capabilities into multiple new domains and that platforms gave a framework to identify specific capabilities and market knowledge requirements.

In reference to the work of Teece, 2010, Verhoeven and Johnson (2017) suggested that a growth platform was a form of a business model that helped an organisation to create, deliver and capture value, helping the organisation to

strategically move into areas that were not only operable but also the right fit. Moreover, Yun *et al.* (2017) identified that growth platforms created value across an organisation's chain of activities by combining internal and external innovations. Svensson (2003) documented that this tying together of core activities in the value chain produced an internal infrastructure capable of gaining a competitive advantage in the marketplace. For FDMP SMEs that had the financial infrastructure and knowledge capability to create NGPs for such an advantage, the company growth would be depended on their organisational strategy. The differing strategic business models (frameworks) selected by differing businesses achieved differing outcomes, each with a different economic impact thereby realising divergent economic growth (Chesbrough, 2010; Verhoeven and Johnson, 2017).

Parker and Van Alstyne (2014) proposed that a platform strategy required third-party governance and networks for success. A platform for product development no longer equated to a single firm's product base and that it was key to open the platform to three main types of external players; consumers, developers and the platform provider (Meyer and Lehnerd, 1997; Chesbrough, 2010; Van Alstyne *et al.*, 2016; Pellizzoni *et al.*, 2018). Platforms also matched buyers with suppliers, directly transacting with each other, using system resources (Parker and Van Alstyne, 2014; Hagiu, 2006; Hagiu and Wright, 2011). Moreover, Laurie *et al.* (2006) reported that the capabilities required for NGPs came from external relationships such as strategic partnerships requiring an NGP unit of three or four senior executives in an empowered team that were entrepreneurial; understood the product markets; had the experience of building new business and who could develop a pipeline of new growth platforms over time, forming strategic partnerships for sustainable growth that extended the ability of the business. Such a 'pipeline' in the form of stakeholder triple helix platforms, was developed by the Welsh Government, in recognition of the need for a strategic partnership for FDMP SMEs without the knowledge or financial ability to develop their own NGPs for existing or new products and markets; in the form of an intervention for food sector growth and innovation (Welsh Government, 2010). Cusumano and Gawer (2002) deemed such a platform strategy as the mobilization of a networked business platform to expand into and operate in a given market, for example, FDMP SMEs supplying the multinational retail sector to achieve food and drink sector growth. Furthermore, Eisenmann *et al.* (2011) described a platform strategy as an infrastructure that can facilitate interactions among the network of users, with Parker and Van Alstyne (2014) documenting that it was a form of a published standard, together with a governance model, that can facilitate third-party participation.

As for the theoretical constructs of integrated platform strategies for regional development, that combined new and existing knowledge, it was perceived as an innovation policy model (Asheim *et al.*, 2006; Asheim *et al.*, 2011) that provided economically profitable products and processes for sustainable competitive advantage as these strategies were strongly bound to a region, based on past trajectories of regional strengths and had the potential to produce competitive advantage (Harmaakorpi, 2006). The notion of CRA success is that there were three platforms; industry, policy and stakeholder, working in alignment with each other to generate a regionally constructed advantage (Cooke, 2007).

4.0 Materials and Methods

To achieve the aims of the study, a quantitative and qualitative triangulated case study mixed-method approach (Collis and Hussey, 2009; Yin, 2009), was utilised, where the adoption of this approach strengthens the reliability of the assessment (Table 1).

The study was initiated with a comprehensive examination of peer-reviewed academic publications to identify the theoretical constructs of the use of stakeholder growth platforms, firstly for organisations and secondly for its applicability as a conduit for enacting sector strategies to positively impact CRA. Regional and innovation policies for Wales were then assessed to identify the rationale for the ensuing strategic food sector development. This led to a review of the EU, UK and Welsh Government reports and strategies to identify food sector development objectives. EU/Welsh Government regional development plans, funding, bids, tenders and contracts applicable to HELIX provided the funder's aims, objectives and project targets, which were reviewed. Qualitative data in the form of government advisory reports provided explanations for FDMP SMEs' business requirements for knowledge transfer to increment their product and processing innovation to add value for competitive advantage; as were FDMP SME letters to the UK Food and Farming minister detailing business support needs, available media and case studies testimonials, and manuscripts from in-house all staff consultation sessions. The identified qualitative data was then analysed using a content analysis approach according to the identified FDMP technical, food safety and science knowledge requirement components.

Table 1.
Platforms and Data Sources

Platform	Quantitative	Qualitative
<ul style="list-style-type: none"> Stakeholder. Knowledge transfer. 	<ul style="list-style-type: none"> Project database (n=1). Funder claims reports (n=22). Completed delivery work packages (n=283). 	<ul style="list-style-type: none"> Project highlight reports (n=22). Tender bid and contract (n=2). Media/press releases (n=33). Case studies (n=11). EARDF Regional development plan (n=1). Operational consultation session manuscripts (n=2).
<ul style="list-style-type: none"> Industry. Related variety. Knowledge spillovers. 	<ul style="list-style-type: none"> Website analytics (n=6). Work package database (n=1). Technologist delivery database (n=1). 	<ul style="list-style-type: none"> Media/press releases (n=33). FDMP Letters to Food and Farming Minister (n=3).
<ul style="list-style-type: none"> Policy. Vertical/Lateral. Knowledge Spillovers. 	<ul style="list-style-type: none"> National and International statistics (n=3). Economic appraisals (n=4). 	<ul style="list-style-type: none"> Regional and innovation policies and strategies (n=9). Regional Government reports (n=11). Food sector policies and strategies (n=6). Advisory reports (n=2). Media/press releases (n=33).

To obtain quantitative data, the relevant Welsh Government's annual economic appraisals were then examined to identify food sector employment numbers giving a background to the sector, and then national statistics were obtained to compare GVA (£) per head with UK counterparts and the same for Welsh localities to form an additional background to the rationale of regional policies and strategies for food sector development. The same method was used to identify the 'gap in prosperity' and where it predominated in locations. To assess the main geographical locations where SMEs required support and to form any correlations between them and the areas identified with a 'gap in prosperity' the HELIX project's operational database and corresponding work packages were analysed. Similarly, to identify numbers, types of company engagements and food production categories. Technologists' databases containing details of their employment history, work package assignments and funder highlight reports were examined to identify their levels of ability to act as a proxy for knowledge transfer. To assess if the project targets were achieved, the funder's claims reports and the final project closure report were used to determine and contrast HELIX's outputs and associated outcomes. This was finally followed by examining Food Innovation Wales's website analytics relating to hosting the Welsh food and drink ingredients and supplier directory created in 2018 by HELIX's operational support teams. From the information available a database containing counties, cities, countries and continents with their associated access metrics was created and analysed to identify continued knowledge spillovers post-project between 2020 and 2022.

5.0 Findings and Discussion

The predominant design of HELIX mirrored the forerunning KITE 2008 – 2015 programme with its use of a university graduate/affiliate placement (Mayho *et al.*, 2023a) but expanded on the previous KITE project support offered to Welsh FDMPs by providing eighteen knowledge transfer activities ternary grouped as 'Food Strategy', 'Food Efficiency' and 'Food Innovation', see Figure 5. It was further developed to increase opportunities for knowledge spillovers in the food sector.

5.1 Knowledge transfer

The three ternary groups' delivery support offerings were designed over three product variables. Product 1, a two-day diagnostic intervention was 100% funded; Product 2, a two to twenty-four-day mid-term delivery intervention with 100% funding for micro businesses, 80% for SMEs with the longer-term Product 3, a long-term programme with an affiliate placement, having a set £10,000 per annum contribution to costs rate. A progression route through the support products was available, or a repetition of a product category as each delivery support intervention was individually tailored to meet FDMP SME-specified business needs.

There was a cumulative total of 283 individual knowledge transfer activities supported across the three ternary groups, with prime SME engagements requested for product efficiency, development and reformulation, process controls, packaging, legislation, quality management systems and certification, technical information and industry intelligence (Figure 5). Interventions were designed to support more than one activity, again determined by SME-specified business needs.

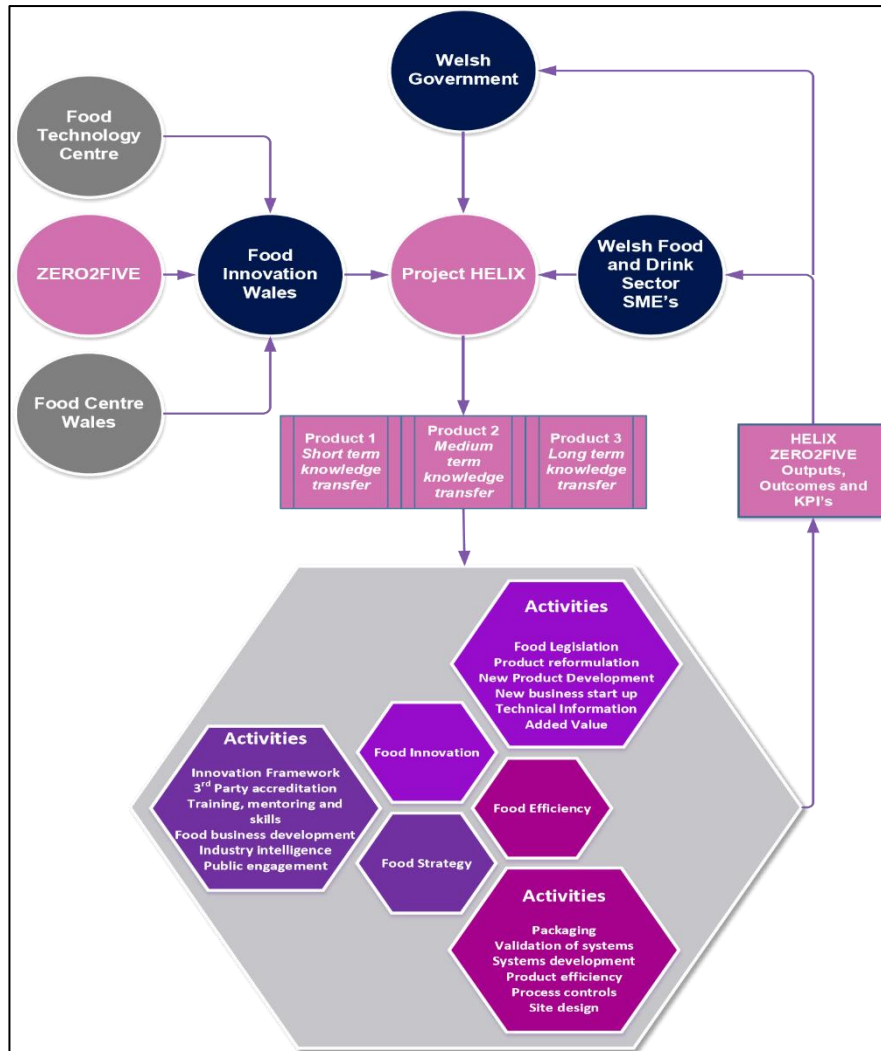


Figure 5. Essential Features of Project HELIX (Source: Mayho et.al, 2023b)

Across the three ternary groups, HELIX engaged in delivery interventions in 151 FDMP SME businesses, the most popular being the 100% funded variable option Product 1 which included 151² delivery interventions in 117 businesses, see Figure 6, of which 64 were new start-up businesses (Figure 6).

Findings highlighted that Bakery at 16%, was the most predominant sub-sector that required technical, food safety/science and skills interventions, followed by a 14% uptake for the Dairy/liquid egg category and 12% for Ready meals/sandwiches and desserts, see Figure 7. These three food categories strongly correlated to industry needs in respect of legislative challenges, such as the forthcoming Natasha's Law 2021, where the UK Food Standards Agency documented 14 different corresponding allergen awareness types (FSA, 2022).

² These 151 delivery interventions should not be in anyway confused as being the same as the 151 FDMP SME businesses, the concept differs in that multiple interventions could occur across any of the Product types, and the figures being the same value was verified as being coincidental.

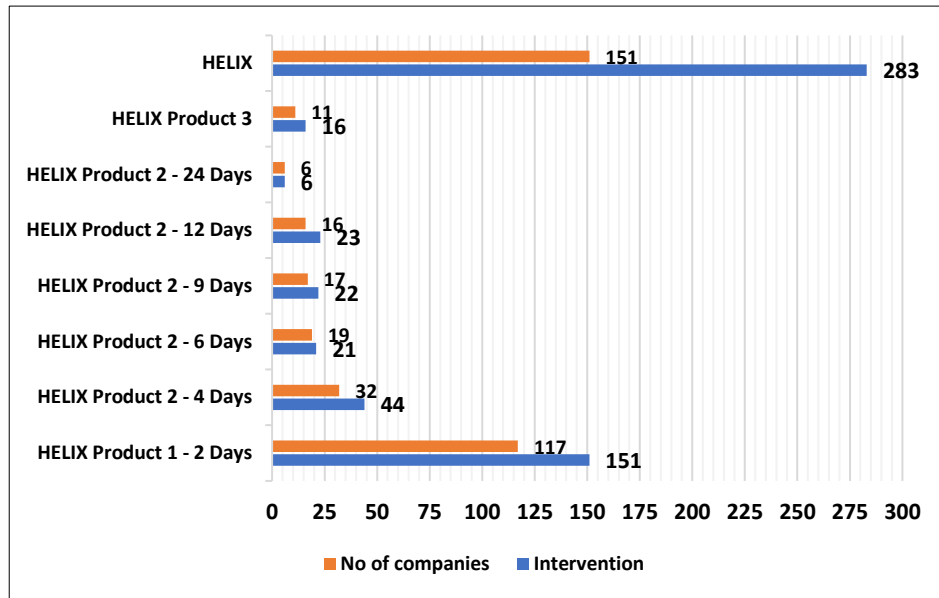


Figure 6. HELIX Product Engagement 2016-2020

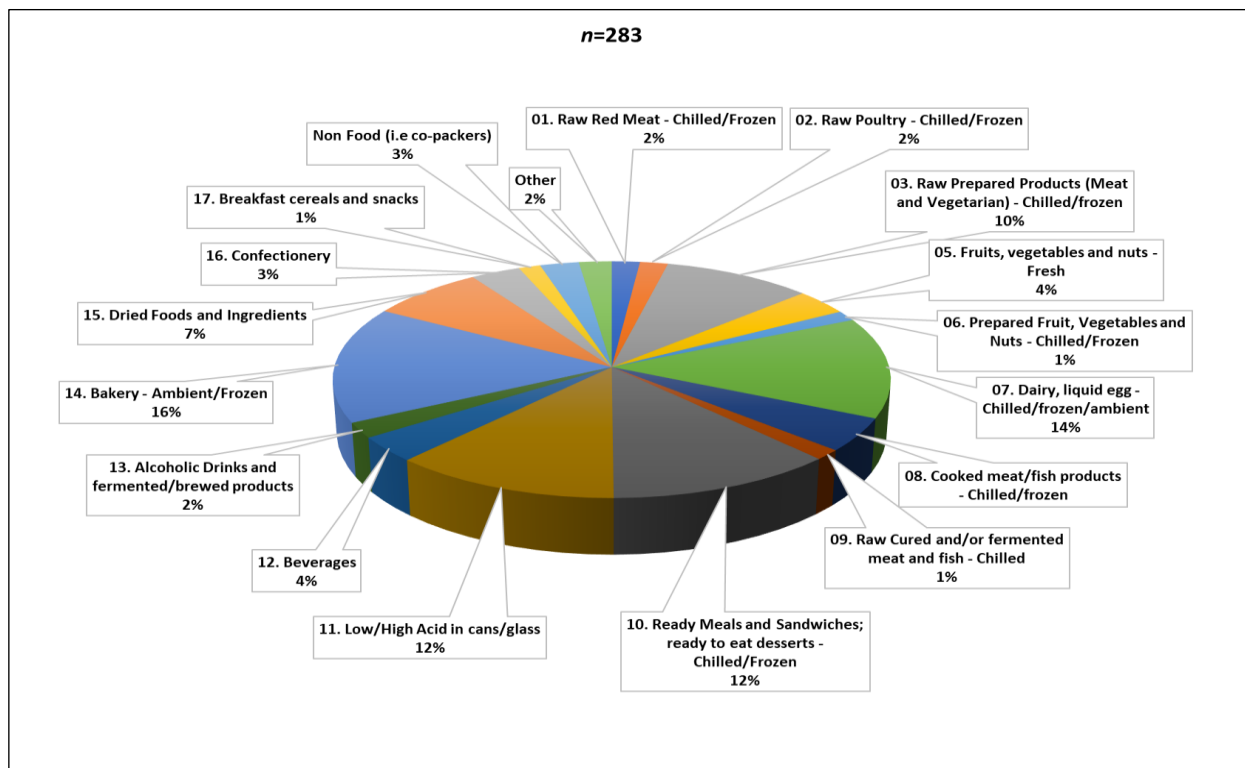


Figure 7. HELIX BRCGS category intervention %

Supported interventions were identified as being predominantly clustered in the old industrial areas of South/Southeast Wales regions (see Figure 8), areas of diverse food manufacturing with production support requiring tailored delivery.

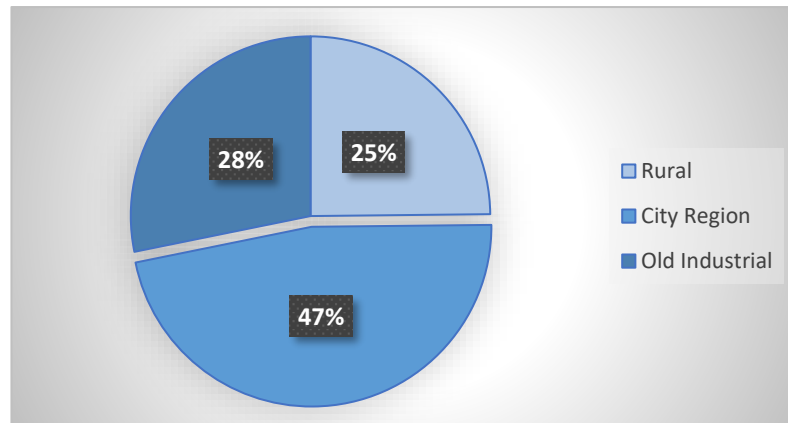


Figure 8. HELIX SME partner locations in Wales by regional categories

4.2 Knowledge Spillovers

The findings also indicated that knowledge spillover opportunities for related variety were incremented during the period as the project's delivery technologists moved from company to company taking their tacit knowledge from site to site across the mixed food and drink micro category sectors such as those identified in Figure 8. A correlation was observed between delivery technologists who had completed eight years or more employment with Zero2Five, three of whom had been originally employed as graduate affiliates on KITE, the previous programme (Mayho *et al.*, 2023a), and the highest volume of company engagements such as TD3, 6, 8, 9, 10 and 12, see Figure 9. The exception is TD7 who held a senior management role and was only engaged for the most complex food safety issues. The remaining TDs, 1, 2, 4, 5, 13, 14, 15 and 16, had been employed at different stages throughout the HELIX period and no particular correlations were identified. However, TDs 11 and 17 each had over 15 years of prior industrial experience before being employed by HELIX. Such differentiated experiential knowledge had the ability to act as a catalyst for knowledge flows to encourage related variety. Examples included supply chain linkages and sustainable local procurement.

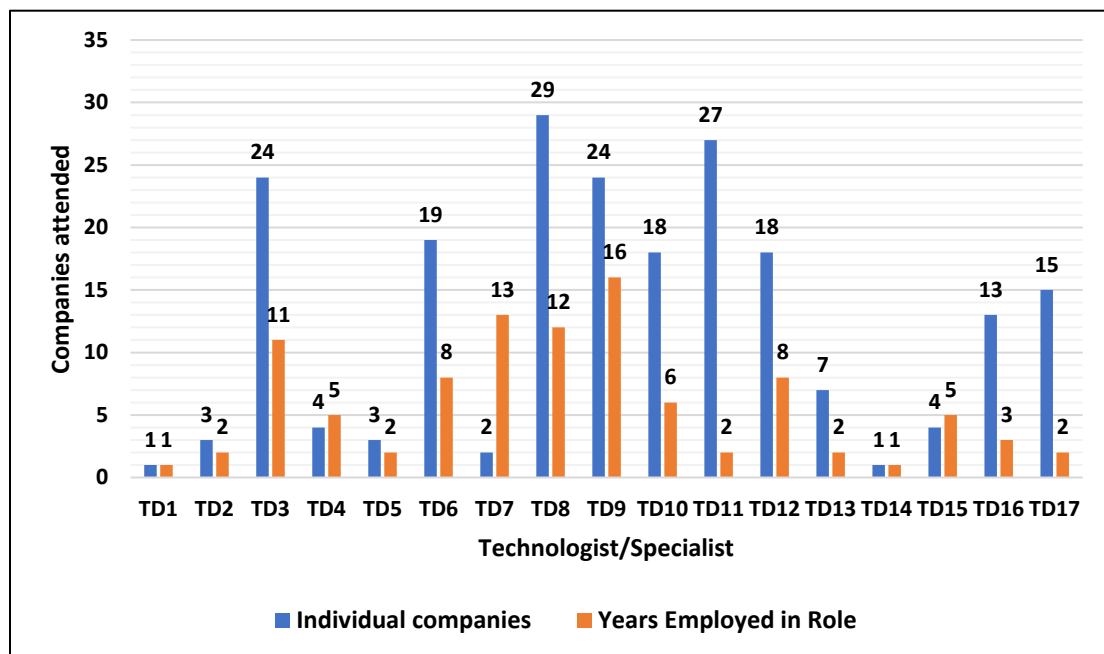


Figure 9. HELIX Technologists and Specialists SME business engagements

Over three-quarters of SMEs' (78%) support was addressed by one assigned technologist (124 businesses, of which 64 were start-ups) who could provide the required knowledge transfer support, see Figure 10. A further 24 SMEs (16%) had engaged with two technologists where different knowledge transfer specialisms were required, for example, product reformulation or quality management systems. Knowledge spillovers were observed in 22% of SMEs when 3 or more technologists and specialists engaged with a company and liaised together to bring a product to the

marketplace. Interestingly, a single company required six technologists with differing innovation specialisms and supply chain knowledge to take a product from concept through marketing analysis and intelligence, legislation, new product development, packaging, branding, and food safety certification to the end product having leading retailer shelf space; evidencing knowledge spillovers from the different bases; analytical (science-based), synthetic (engineering-based) and symbolic (arts-based) (Asheim *et al.*, 2011).

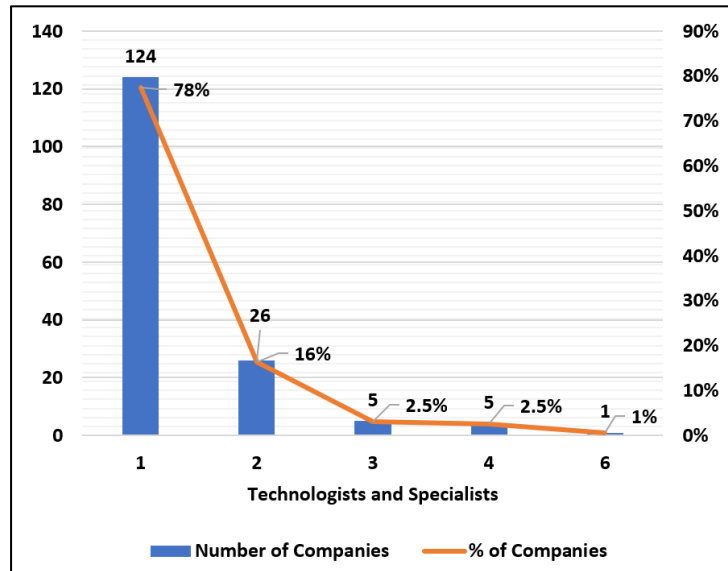


Figure 10. HELIX Partner SMEs receive multiple technologist and specialist support.

In addition to the food sector receiving technical delivery support, the wider HELIX support team engaged in other activities to increment related variety from knowledge spillovers from the 2018 development of the online self-registering Welsh Food and Drink Producer and Ingredients Directory. Based on consultations with SMEs it was developed with searchable functions to identify manufacturers of products, ingredients, packaging and by products, suitable supply chain partners, manufacturers with private label production capacity, and companies offering co-packing services. To date, it lists >510 contactable companies that manufacture food and drink products in Wales and is listed on the Food Innovation Wales website. Whilst findings showed that the directory had been accessed >74k times since 2020, the analytics were not sophisticated enough to determine the actual profiles of users. However, the website analytics show that the majority of users were in Europe (80.6%) of which 73.8% were UK based. Within the UK, 19.1% of the main users were located in London, Birmingham, Liverpool and Manchester, city areas with a high proportion of food and drink manufacturers. Of local users in Wales, 21.54% were identified as being predominantly based in the urban areas of Cardiff and the Vale, and the old industrial southern Valleys, promoting sustainable supply chains within areas of diverse food sector outputs, see Table 2. The importance of these analytics should not be underestimated as the development of the directory contributed to extra-regional knowledge and provided an opportunity for trade flows and knowledge spillovers between related and non-related sectors (Asheim *et al.*, 2011) predominantly nationally and internationally, with a nominal effect for global regions.

5.3 Project Outputs

The key impact metrics used by the Welsh Government to determine sustained economic growth were jobs created and increased business turnover which was reflected in the output targets to be achieved. HELIX's achieved outputs included increased/sustained jobs reported for the sector with 214 jobs created and 1,120 safeguarded (Table 3). However, in respect of HELIX's ex-post evaluation still pending at the time of the study, and no observations being found for a methodological provision for causality and additionality, it is assumed that outputs and outcomes followed a strategic top-down development approach and therefore are assumed as gross (UK Government, 2014). Nevertheless, the reported figures still bore relevance to combating the aftermath of the 2008 to 2010 recession (Harrison and Baldrick, 2015) where overall employment in Wales had seen greater relative falls than the UK, falling 3% over the first two years compared with 1% for the UK as a whole. Similarly, less relative employment growth between 2010 and 2017 was reported, 6% over the seven years compared with 10% for the UK (Welsh Government, 2018). By 2019, there had been an increase of 18,960k personnel working in its food supply chain to a total of 239,320k, (Food and Drink Economic Appraisal, 2020).

Table 2.
Website users 2020-2022

Continents	n=16,723	Global Countries >100 users	n=16,765	Global Cities and Towns >100 users	n=17,576
Europe	13,494	United Kingdom	12,382	London	2,313
Asia	1,485	United States	945	Cardiff	1,866
Americas	1,293	India	502	Birmingham	239
Africa	345	Netherlands	153	Llanelli	239
Oceania	62	France	143	Bristol	224
Not set	44	China	127	Ashburn	214
		Canada	126	Liverpool	193
		Germany	124	Bridgend	188
				Manchester	184
				Carmarthen	167
				Bengaluru	166
				Neath	164
				Newport	163
				Pontypridd	146
				Wrexham	144
				Caerphilly	133
				Bangor	130
				Cwmbran	124
				Barry	116
				Swansea	103
				Haverfordwest	102

Table 3.
Project HELIX Outputs and Activities 2016-2020

Project Outputs	Targets Achieved	Target Outputs
Financial Impact	£96.5 m	£75.0m
Enterprise Assisted	121	123
New Jobs Created	214	225
Training Days with;	150	155
Participants	234	275
New Markets Accessed	129	90
Activities Achieved	18	18
New Products Created	305	228
Food Sector Jobs Safeguarded	1,120	1,141
New Businesses Supported	92	10

Most Frequent Activities	KPI's
Quality Systems Development	89
Provision of Technical Information	85
Training/Mentoring and Skills	42
Validation of Systems	42

By the close of the project, key outputs also reported a £96.5m financial impact reported by FDMP SMEs which surpassed the £75m target and was a positive economic contribution to GVA (£ per head) for the food sector, where the city region benefited the most at >£45.5m impact, seconded by the rural region at >£44.9m, with the old industrial region equating >£4.2m (an actual total of £>96.5m, see Table 3). Overall, it was reported that the FDMP sector experienced growth from £4.8b in 2013 to £5.2b by 2019 (Food and Drink Wales, 2020).

The objective to improve the competitive position to boost GDP from new markets accessed was contributed to by the key performance indicators (KPIs) which were 85 provisions of technical information, 42 systems validations and 42 instances of training/mentoring skills development across 150 training days with 234 participants receiving skills development. From the latest available figures, technical skills in the food sector were identified as incrementing from 15% in 2013 to 19% by 2017 where such skills were deemed essential for meeting legal compliance such as food safety management and labelling legislation (Ellis *et al.*, 2023). Knowledge transfer for new product development (305 new products) and quality systems developments (89 instances) increased FDMP's technical and food science/safety ability to engage in food safety schemes, such as BRCGS and Safe and Local Supplier Approved (SALSA) (SALSA, 2013) compliance allowing product supply to leading retailers and the export market (Evans *et al.*, 2020). FDMP SMEs reported 129 new markets accessed, contributing to the total value of food and drink exports for the nation, which increased to £539m in 2018, from £399m as of 2013, with a 77.27% value exported to the European Community and major increases to the North-East and Middle Africa (Food and Drink Wales, 2020).

6.0 Conclusion

Regional development platforms were described by Yun (2017) as a tool for regional innovation and policy. As such, the Welsh Government/EU developed regional strategic growth platforms as tools for the nation's food and drink sector to gain a competitive advantage by adding value to Agri products via innovation, processing, efficiency and marketing; and boosting jobs and growth. This paper emphasised the need to conduct a study to determine the effectiveness of strategic stakeholder growth platforms as food sector interventions for CRA. In the case of HELIX the study findings corroborated that Welsh Government developments successfully aligned with the Collinson and Quinn (2002) concept that small firms could generate their own wealth and employment, by working in a networked partnership approach that linked small firms with academia and government assistance for knowledge and skills acquisition as a strategy for growth; in a planned way to overcome economic crises impacting the food sector and the difficulties SMEs had in obtaining finance for growth. At the firm level, as a triple helix initiative, Project HELIX's outputs confirmed its effectiveness in supporting SMEs to successfully navigate the change drivers associated with the food industry to ultimately produce safe and legally compliant products destined for local supply, leading retailers and the export markets. Without this support, financially constrained SMEs had a reduced competitive advantage ultimately resulting in regional-level job losses and a backward regression from economic contribution to GVA (£ per head).

From a policy perspective and as a strategic stakeholder growth platform, HELIX effectively contributed to CRA at the intersection of the industry platform and the policy platform from the following observations. The stakeholder platform was significantly interrelated with the industry platform in its support interventions and development activities being indicative of where vertical policies supported networks for codified and tacit knowledge transfer and spillovers. This was exemplified by engagement activities such as new product development, technical support, training, mentoring and quality systems, and the technical mobility between companies. Interrelation with the policy platform was observed in the operational support activities exemplified by the online supplier and ingredients directory to increase domestic, national and global related variety which positively correlated with strategies for high-growth localities and regions (Boschma, 2005; Cooke, 2007). The finding also suggested that HELIX had a varied effect on CRA at the individual regional level, where it was observed that the majority of SME engagements in the old industrial areas of South/Southeast Wales with the lowest GVA £ per head and the widest 'persistent gap in prosperity', reported the least economic impact. As such, if strategically developed triple helices for the food sector are required for CRA, then the helices need to be designed as a stakeholder growth platform that also incorporates large FDMPs with a high growth potential in localities with lower GVA £ per head, rather than engage with new start-ups in these areas. Developing start-ups can be addressed via other initiatives.

The research recognises that as a case study sample, it has limitations primarily as it represents only one stakeholder platform initiative for Welsh food sector development. Secondly, after considering potential marginal losses, acknowledgement needed to be given to the fact that the true impacts of the growth platform can be wider ranging than its recorded outputs. Such impacts include the multiplier effect across the food sector supply chains and their associated industries. This can be extended to the localities of SMEs with their inherent local economies. Conversely, it needs recognition that an evaluation of the key components of additionality had not knowingly been undertaken, with the Welsh Government's evaluation of HELIX pending at the time of writing, leading to the assumption that recorded outputs are the gross rather than the net (UK Government, 2014).

Further research at the firm level is recommended to determine what elements of the technical/food safety and science product and process knowledge transfer and industry knowledge spillovers had the most direct impact on business growth and indirect impacts on food sector supply chains. Secondly, results from the study concerning the majority of support interventions required for the Bakery sector suggest a further study to determine if this is a specific sector requirement for more technical and food safety/science support as opposed to natural phenomena. There is also scope to conduct a parallel food sector intervention assessment at an international level, as the lessons learnt from this unique enquiry suggest that when using the theoretical notion of a tripartite platform model of stakeholder, industry and policy constructs for growth; the paradigm will only be successful for CRA in practice if policy interventions are designed to fit within the capabilities of their regions. Findings from this study will be further developed to inform key strategic policy and industry stakeholders of which FDMP support activities increase knowledge transfer and knowledge spillovers.

Acknowledgements

The authors would like to thank the Welsh Government/European Union for providing financial support for developing and implementing Project HELIX. They would also like to acknowledge, the ZERO2FIVE Technical and all Operational teams for the delivery of the projects.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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