Situation of Innovation and Technology Application in Central Highlands Enterprises

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Abstract: An effective framework for innovation and technology application is a significant priority in every country's science, technology, and innovation strategy. Innovation is critical for the economic growth of countries, regions, communities, and enterprises, particularly in the context of digital and knowledge economies. According to the report of the Ministry of Planning and Investment (2020), Central Highlands region has a relatively low level of business development compared to the whole country. The Central Highlands is also the region having the lowest economic growth rate of Vietnam; Its economic growth model in the recent period has mainly been based on breadth, low quality of human resources, and high poverty rate. In the context of Industry 4.0, science and technology has become a key driver of economic growth. To contribute to the successful transformation of the economic growth model, the implementation of innovation and technology application in enterprises is of key significance. Based on the results of a survey on enterprises in the Central Highlands, this paper focuses on reviewing the situation of innovation and technology application in the enterprises, the investment in research and development, and several limitations in innovation and technology application in the Central Highlands enterprises.

Keywords: Innovation, technology, enterprises, Central Highlands.

Subject classification: Public policy

1. Introduction

Scientific discoveries are the basis of applying new technologies today. The exponential rise of discoveries and inventions in recent years has reduced the technology life cycle and the application of new technology based on such discoveries and inventions. *Technology transfer* and *diffusion* are two approaches for corporate technology adoption. The paper concentrates on corporate innovation through technology transfer and application.

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According to the Law on Technology Transfer (2017): *Technology transfer is the transfer of technological knowledge, data, design drawings, inventions, know-how, equipment, production and operation processes, management skills from one organisation to another*. Technology transfer may extend beyond a country's borders, with the participation of numerous entities such as businesses, universities, research institutes, laboratories, and technology incubation enterprises, to effectively transfer technologies from places with advanced levels to less-developed areas, thereby satisfying stakeholders' needs. Technology transfer mechanisms are diverse, and they are always evolving and being perfected, along with socio-economic progress. Purchasing patents, copyrights, research and deployment; training and coaching; technology transfer through programmes and projects; technology transfer through the formation of joint ventures or associations; and technology transfer through experts or advisors, are examples of prominent methods of technology transfer (Ha Huy Ngoc, 2019). In the context of the Fourth Industrial Revolution (4IR) and digital transformation, it is vital to provide policies to encourage corporate innovation, exploration, transfer, and adoption of technology to boost production and performance efficiency and corporate competitiveness. It is more relevant given Vietnam's efforts in restructuring its economy associated with shifting the growth model in towards increasing growth quality and the urgent need to promote business development in general, and innovation in the Central Highlands enterprises to narrow the development gaps among regions.

2. Overview and research methodology

Vietnam's enterprises have been comparatively slow to embrace science, technology, and innovation compared to the rest of the globe. Local studies on enterprise innovation have been based in general principle on the works of foreign notable scholars, as well as the works of Nguyen Manh Quan (2006), Hoang Van Tuyen, Nguyen Thi Minh Nga (2006), and the National Institute for Science and Technology Policy and Strategy Studies (2008). The phrase “national innovation system” was not referred to in official documents of Vietnam’s legislature and executive branches for a long period of time. Policy researchers also used other words to express the meaning of this phrase, for example “science and technology national innovation system”, “national innovation system by science and technology”, or “research and deployment system”. However, such interpretations are not really appropriate. These concepts are not interchangeable as each embodies its own meaning. The primary explanation is most likely a confusion between political and economic innovation through science and technology (S&T). The document issued by the Communist Party of Vietnam's 11th Party Congress, which detailed a strategy of developing an innovation system, helped to clear up the uncertainty. The components of Vietnam's national innovation system are already in place, and several

S&T initiatives have been recognised as innovation milestones. However, the system has not yet been constituted, and the policies have not yet been in effect. This problem is raised repeatedly in some S&T policy studies (Dao Thanh Truong, 2017).

In this study, the authors have used Vu Cao Dam's (2007) approach to the innovation system, and consequently, enterprises' S&T are identified as follows: (i) innovation system indicates the purpose of the system to be "innovation"; (ii) S&T system relates to means of innovation as S&T; (iii) research and development (R&D) system refers to the core innovation method as R&D; and (iv) innovation system generally is a system with holistic innovation purposes, with S&T and R&D being the means and key method. Vietnam's innovation and S&T system is comprised of four essential components: the government, enterprises, research institutes and universities, and S&T intermediaries. It used to be that research institutes were commonly viewed as the heart of innovation. Given the critical influence of the Fourth Industrial Revolution on many aspects of socio-economic life, S&T is becoming increasingly essential in the promotion of labour productivity, growth quality, and economic competitiveness, and companies are becoming the centre of innovation (National Assembly Committee on Science, Technology and Environment, 2019).

Nearly 35 years after *Đổi mới* (Renovation), the Central Highlands' economic development rate remains the slowest in the country, the quality of human resources is low, while the poverty rate is the highest. Specifically, throughout the preceding period, the area's economic growth was extensive and mostly dependent on capital, cheap labour, exploitation of natural resources, forests, and hydropower, while the contribution of total factor productivity (TFP) components, such as technology or institutions, remained modest (Ha Dinh Thanh, 2020). Agriculture was the most important economic sector, but productivity was more dependent on natural factors (land, weather, climate, water supplies) than on investment in intensive farming and the use of S&T. The region has paid a high price for its "trade-offs for growth" strategy, including the loss of natural, watershed, and primeval forests, which has resulted in increased flooding, drought, and desertification. Surface and groundwater levels have plummeted and are on the verge of depletion as a result of the massive planting of industrial crops. Rapid migration and urbanisation have eroded the cultural value of the local area. Environmental problems and disputes have arisen, particularly at bauxite mining and hydropower projects (Ha Huy Ngoc et al., 2020).

S&T has emerged as a key driver of economic growth in the context of the Fourth Industrial Revolution. The implementation of innovation and technology application in the enterprises is of great significance to the successful transformation of the economic growth model in the Central Highlands in the 2021 to 2030 period as they are at the heart of the region's science, technology and innovation. According to Ministry of Planning and Investment (2020) assessment, the Central Highlands' degree of business development is relatively low when compared to other areas in the country. As of December 2018, this locality had approximately 15,000 domestic private firms,

accounting for about 3% of all enterprises in the country. The Central Highlands has an average of 25 firms per 10,000 inhabitants, or 400 persons per enterprise. The total capital of firms operating in the region was the lowest when compared to other regions, accounting for just VND 373 trillion, or 1% of the total. As of December 2018, there were 144 active foreign direct investment (FDI) projects with a total registered capital of USD 900 million, accounting for 1% of total project number and 0.3% of total FDI capital (Ha Dinh Thanh, 2020).

The Central Highlands retains a modest position in the Vietnam's overall picture of enterprise growth. Only 14,406 of the 504,738 newly-established firms countrywide between 2011 and 2018 came from this region, accounting for 2.85%. During the same time period, the area reported VND 122,333 billion in newly registered capital and 140,003 registered workers, representing 3.62% and 2.72% of the national total respectively. In comparison to other sectors of the country, the numbers revealed fairly limited business development (Agency for Business Registration, 2019).

The random stratified sampling method with purposeful sampling has been applied in the paper on 200 enterprises[4] in five Central Highlands provinces, namely Lam Dong, Gia Lai, Kon Tum, Dak Lak, and Dak Nong. Start-ups, S&T firms, advanced business models and high-tech agricultural manufacturing companies, pharmaceutical companies, tourism agencies, and regional key product manufacturing companies were among those surveyed, which included 40 state-owned one-member limited liability companies and 160 private enterprises. This survey's purposes were to explore the production situation, the impacts of related policies and mechanisms, the difficulties encountered in doing business, as well as make recommendations for improvement. Quantitative information from this survey was processed by the SPSS 18.0 with statistical value in producing tabular and graphical statistics on various aspects of the state of innovation and technology enterprises.

The survey results showed an overview of the awareness and current status of innovation, technology advancement, R&D investment, and the impacts of innovation and technology application on business productivity in the Central Highlands during the 2011 to 2019 period. At the same time, it also provided some policy implications for the policymakers, authorities, and enterprise managers in the Central Highlands.

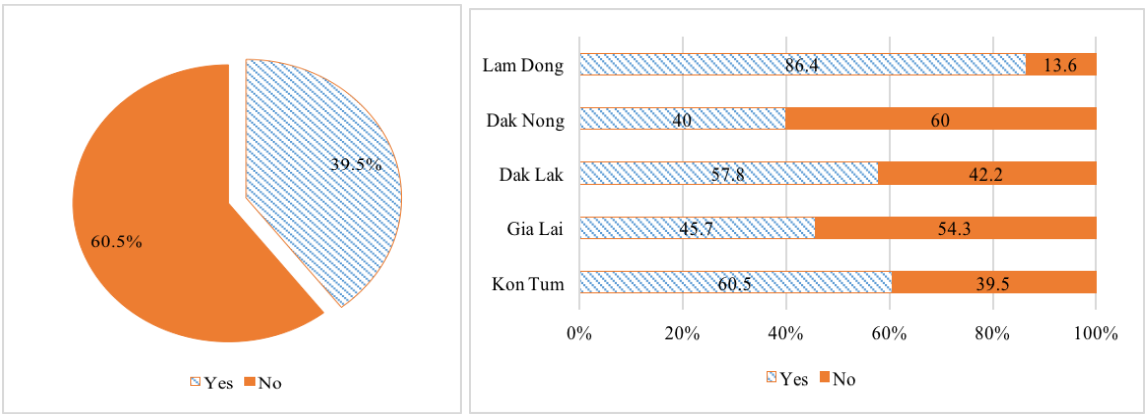
[4] Enterprises survey results of science and technology topic at the State-level on the "*Solutions for Supporting Policies for Innovation and Application of New Technology in Central Highlands in New Context*", under the Central Highlands programme for the 2016-2020 period "*Science and Technology for Socio-economic Development of Central Highlands in Regional Linkage and International Integration*", code KH&CN-TN/16-20, chaired by Assoc. Prof., Dr. Ha Dinh Thanh and the Institute of Regional Sustainable Development as the lead agency.

3. Research findings

3.1. Status of innovation in enterprises

The survey results showed that more than 60% of enterprises in the region have engaged in innovation-related activities. In particular, Lam Dong is the province with the highest rate of enterprises carrying out such activity (nearly 90%), followed by Kon Tum, and Dak Lak. This is understandable as the three provinces have more favourable socio-economic conditions than the two other provinces, namely Gia Lai and Dak Nong.

Figure 1: Status of Enterprises Engaged in Innovation in Central Highlands

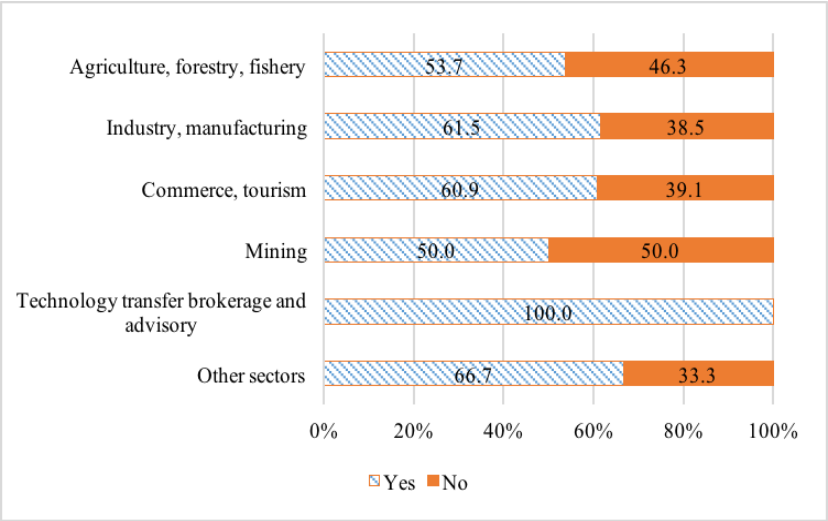


Source: Ha Dinh Thanh, 2020.

The survey results also showed that while 100% of companies in the technology transfer brokerage and advisory sector conducted innovation activities, a pretty high percentage, at above 60%, of companies in the fields of industry, manufacturing, commercial and tourism also engaged in these activities. In addition, the agriculture, forestry, fishery and mining sectors also carried out these activities quite well, accounting for half of the survey respondents.

It is worth noting in the cause for innovation activities that they are mainly driven by business requirements, rather than other external factors such as state incentives. Given the consumer expectations and pressure from competitors, this action is crucial to a company's survival. Only 4.9% of enterprises participated in innovation as a consequence of governmental incentives, whereas 5.8% engaged as a result of importing nations' needs. It is understandable given that companies have yet to benefit from the state's innovation programmes and the number of exporting companies account for only a small proportion of those surveyed.

Figure 2: Status of Enterprises Conducting Innovation by Field



Source: Ha Dinh Thanh, 2020.

However, current innovation efforts by the Central Highlands firms have not reached a high level, as most of them go no further than improvement activities; only 26.3% of enterprises generate new products. Product improvement initiatives are typically seen as "sustaining innovation" and are granted utility solution patents. Meanwhile, "disruptive innovation" that generates new items will be granted invention patents with validity lengths double that of utility solution patents. Besides, renovation was not effectively encouraged when just 23.2% of companies improved product design, 10.7% renovated product characteristics, 15.2% advanced the functions, and 18.3% improved eco-friendly goods. Furthermore, only about 40% of companies improved their production processes, mainly using system software. Some enterprises produce new technology to reduce production and distribution costs. This represents the broader corporate trend in the framework of the 4.0 technological revolution (Industry 4.0), which is to apply technology to production and business. Most businesses do not innovate their marketing and sales processes. While enterprises are primarily concerned with promoting their products to increase sales, just 15.2% are interested in product distribution innovation. This is also noteworthy since distribution plays a significant role in lowering costs and increasing product value, especially given the Central Highlands' terrain which is unsuitable for the circulation of goods. Only a few companies are interested in improving their organisation and management system, fewer than 30% use slimmed-down management approaches to simplify the administrative apparatus and less than 15% carry out initiatives to enhance knowledge management and an innovative organisational culture. The most prevalent reason given by businesses for not innovating was a lack of financial resources, followed

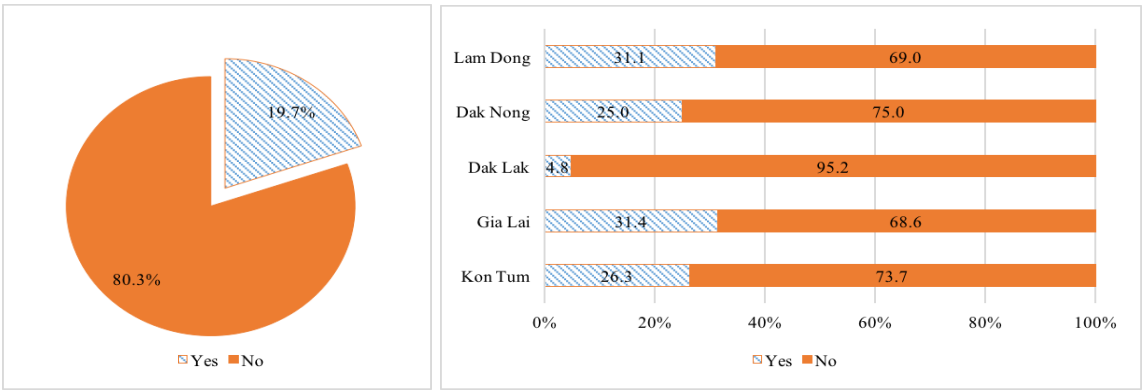
by the excuse of insufficient human resources and manufacturing infrastructure for innovation. Besides, 6.7% of enterprises reported yet accessible central and local innovation policies, while 3.1% claimed a lack of state information on innovation. In addition, enterprises also believed that the lack of management capacity and information on innovation in general also prevented them from carrying out this activity. It demonstrated that corporate innovation propaganda and awareness-raising initiatives were not sufficiently encouraged. Enterprises are clearly in need of funding, human resources, and information technology to carry out innovative activities.

3.2. Technology innovation in enterprises

Over the last five years, more than 80% of the surveyed enterprises have not adopted technological innovation. Survey results also showed that a higher percentage of companies in Gia Lai, Lam Dong, Kon Tum provinces are applying technological innovation than Dak Lak and Dak Nong provinces.

More than two-thirds of Central Highlands firms have adopted technological innovation, mostly in the fields of industry and manufacturing, agriculture, forestry, fishing, commerce, tourism, and other sectors. Notably, out of the responding enterprises no mining, brokerage, or technology transfer consulting firms have engaged in technological innovation.

Figure 3: Percentage of Enterprises Engaged in Technology Innovation within the Past Five Years



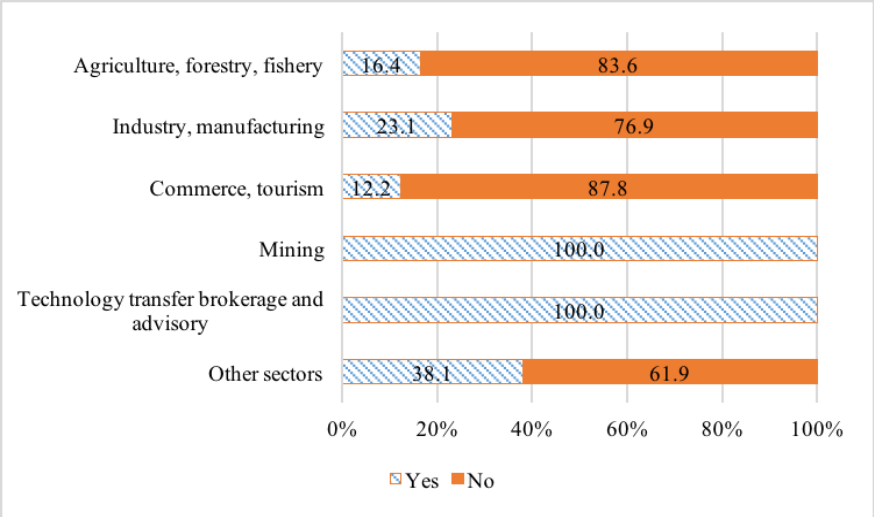
Source: Ha Dinh Thanh, 2020.

The majority of organisations which had explored the application of new technologies in the previous five years have produced the first generation of new technology. The three years of 2014, 2015, and 2016 were filled with significant accomplishments as corporations

embraced several new technologies, particularly the second and third-generation new technologies. There have been no improvements in the creation of new technology during the subsequent three years, from 2017 to 2019, and no business has embraced second or third-generation technology.

Furthermore, just 17.2% of businesses engaged in technology transfer. The activity is most apparent in Kon Tum, followed by Lam Dong and Gia Lai, while only 5% of companies in Dak Nong implemented technology transfer.

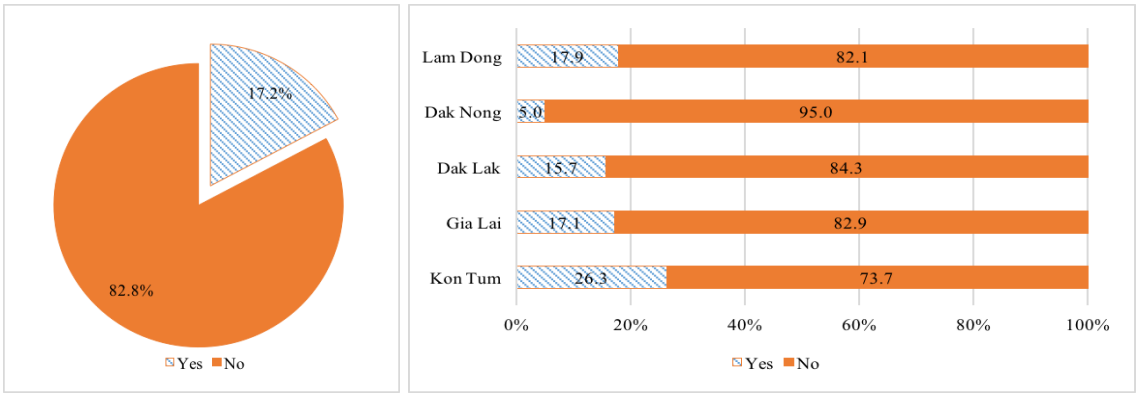
Figure 4: Percentage of Enterprises with Technological Innovation Application by Field



Source: Ha Dinh Thanh, 2020.

The same situation of new technology application was repeated for enterprises receiving the new technology transfer. For the 2018 to 2019 period, none of the surveyed companies received a second or third technology transfer. The highest percentage of companies obtaining the first new technology transfer were in 2015 and 2018, with 36.4% for each year. Agriculture, forestry, fisheries, industry, manufacturing, commerce, and tourism were the primary areas for technology transfer. Meanwhile, none of the companies in the mining industry engaged in this activity. The majority of transferred technologies were not protected by intellectual property rights. Only 21.4% of enterprises in the fields of agriculture, forestry and fishery have transferred technology protected by intellectual property rights while 22.2% came from different fields to the main sectors. Kon Tum and Lam Dong were the two provinces to enforce intellectual property rights the best, with over 30% of enterprises having transferred technology with intellectual property rights protection. In other provinces, there are cases of new technology transfer without intellectual property protection.

Figure 5: Enterprises Engaged in Technology Transfer

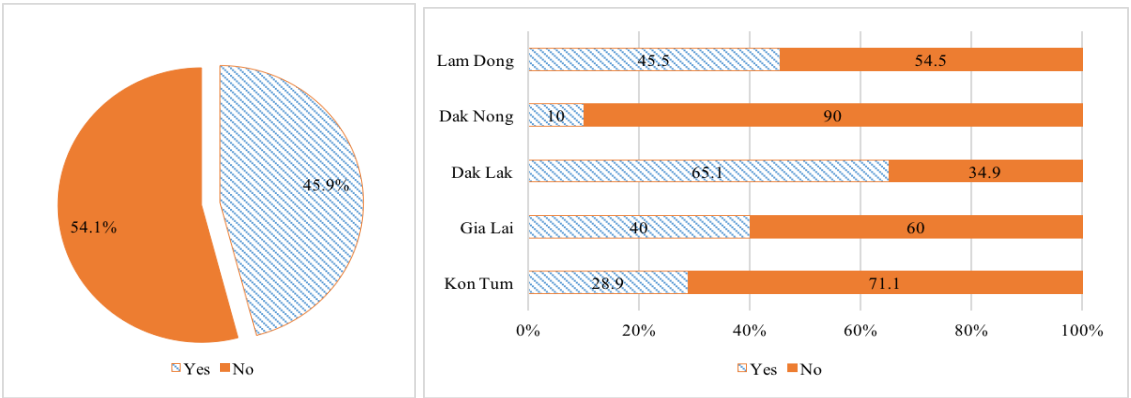


Source: Ha Dinh Thanh, 2020.

3.3. Corporate investment in research and development

The survey results showed that 54.1% of enterprises in the area have divisions or departments tasked with R&D activities to enhance innovation and application of new technologies. Out of the provinces referred to in the survey, Dak Lak has the highest percentage of enterprises with R&D departments (65.1%), followed by Lam Dong and Gia Lai with 40%, while Dak Nong, on the other hand, is the least with only 10%.

Figure 6: Enterprises Having R&D Department

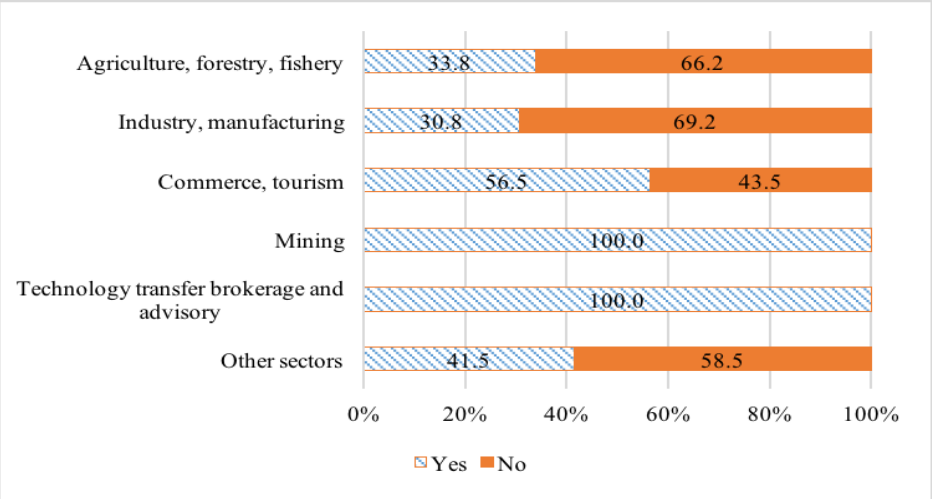


Source: Ha Dinh Thanh, 2020.

It is worth mentioning, however, that 100% of companies in the fields of mining, technology transfer consulting, and brokerage have R&D departments tasked with

enhancing innovation and new technology applications. Meanwhile, only approximately 30% of companies in sectors such as agriculture, forestry, fisheries, commerce, and tourism have R&D divisions.

Figure 7: Enterprises with R&D Department (by Sector)



Source: Ha Dinh Thanh, 2020.

Most of the surveyed enterprises believed that having an R&D department is critical to their production and business. Only 3.8% of enterprises that are in the fields of commerce and tourism considered it “unimportant”. However, this can be explained by the fact that R&D is not a necessity for services companies. Enterprises in the industrial and manufacturing sectors place a high value on the role of an R&D department, with 66.7% rating it as "very important" and 33.3% rating it as "important". Enterprises in Lam Dong and Gia Lai place a greater emphasis on the relevance of R&D to their business operation. However, businesses in the Dak Lak region are among the minority believing this department is "unimportant".

Local companies' R&D departments encountered several problems during the process of innovation and technology application. The biggest challenge for this department is a lack of qualified human resources, claimed by 32.6% of enterprises. The next issue is the difficulty in obtaining S&T information and transferring technology. A few companies’ R&D departments encounter challenges due to not enough staff, a lack of attention from business executives, and inadequate infrastructure. Thus, improving S&T information and quality of teams in R&D departments is a must for corporate innovation and technology application.

Most companies believed that the R&D department benefited their production and business performance. However, the proportion of enterprises that rated the department as

"very efficient" remained low, with less than 15% across all sectors. In the mining sector, 100% of enterprises have an R&D department, and all agreed this department is beneficial to their business performance. A few enterprises (4.8%) in the field of agriculture, forestry and fisheries regarded this department as inefficient, while 33% of enterprises in the industry and manufacturing sectors found the R&D department to be not very efficient.

According to the survey results, enterprises in Lam Dong, Dak Lak, and Kon Tum operate more efficient R&D departments than the other provinces in the survey. In these three provinces, the majority of R&D departments are classified as efficient or highly efficient. Companies in Dak Nong Province have probably not yet acknowledged the effectiveness of this department in their operations; they all assessed “efficiency” as "normal". A few businesses in Lam Dong and Gia Lai Provinces rated their R&D departments as "inefficient" or "not very efficient”.

4. Several assessments on innovation and technology application in Central Highlands enterprises

4.1. Several assessments and comments

Some overall findings on the status of innovation and technology application drawn from the survey results of enterprises in five Central Highlands provinces in the region are as follows:

Firstly, the proportion of Central Highlands firms that have carried out innovation activities and used new technology in recent years demonstrates that attention and investment in innovation and application of new technology are still low. Enterprises recognise the importance of innovation and technical innovation in the context of the 4IR, but they are still unprepared for innovation activities, failing to actively seek and benefit from governmental and local assistance programmes and policies. There is also a concern about administrative processes when accessing support programmes. Financing, S&T personnel resource, and stakeholder connections are common issues for regions in developing nations like Vietnam. However, the survey results revealed that Central Highlands businesses are likely to be uninterested in identifying problems and presenting solutions to the government to overcome these difficulties.

Secondly, there are gaps in the innovation and new technologies application activities among the regional provinces and the main manufacturing and business sectors.

Enterprises in Lam Dong, Gia Lai, and Kon Tum are more interested and active in innovation activities than those in the rest of the region. However, current innovation efforts in Central Highlands businesses have not reached a high level since most of them go no further than improvement activities. Most firms do not engage in creative marketing and sales activities. Only a few engage in product distribution innovation. This is also worth highlighting since distribution plays a vital role in lowering costs and increasing

product value, especially noteworthy given the Central Highlands' terrain which is unfavourable in the transportation of goods.

Technical renovation is mostly applied by companies in the fields of industry and manufacturing, agriculture, forestry, fishing, commerce, tourism, and a few other sectors. Notably, there were no mining and brokerage, or technology transfer consulting companies to have applied technological innovation and a limited number of enterprises were engaged in technology transfer. Therefore, many enterprises desired an enhancement of connections and collaboration with research institutes, universities and support in consulting and brokerage of technology transfer in the area.

Thirdly, the awareness of society, particularly businesses, about the role of S&T, and the innovation and application of new technologies to socio-economic development in the context of the knowledge economy and the 4IR, is still very limited. Science, technology, and innovation communication have yet to play their full roles in this area. Information on programmes and policies to encourage innovation and the use of new technologies, as well as instructions on procedures, administrative processes, and access to financing, have not yet reached enterprises and entities, which limits policy effectiveness.

Fourthly, financial limitation is a significant reason hindering companies from engaging in technological innovation, technical developments, and technology transfer. Few businesses received local assistance in the process of innovation and technology implementation. Local government help for business innovation and technology application takes the form of streamlined company licensing, registration, and administrative procedures. There is little support in terms of capital, interest rates, organisation of industry fairs and exhibitions, commercialisation of research results, technology development or land tax exemption, production expansion, consulting support, and technology brokerage. Investment in the Central Highlands in science, technology, and renovation is limited and primarily funded by the state budget and commercial banks; financial support for businesses engaged in research and technology transfer is still modest and unattractive. Many firms, on the other hand, do not submit applications for incentive programmes or support policies because they do not meet the criteria. Thus, it is still crucial for the Central Highlands to have suitable financial policies in place, enhance the efficiency of S&T development funds, increase the scale, and broaden the audience and incentives.

Fifthly, intellectual property protection is not a top priority for local firms. Most transferred technologies are not protected by intellectual property rights, and very few businesses expect local assistance in intellectual property protection.

Sixthly, the Central Highlands' system of innovation and application of new technologies lags far behind that of Vietnam as a whole and the rest of the globe. Some features are as follows:

- Scientific studies have few links to education or business. Local universities have not paid sufficient attention to their science research functions, and regional institutes under the Academic Institute have not integrated research with training and commercialisation of

research discoveries for enterprises. Some local universities have now formed research institutes, but the rules to accommodate them are not yet in place.

- Enterprise production is also separate from research. Most businesses operating in the Central Highlands buy, sell and use old technologies and are not interested in technological innovation.

- There is little collaboration in research among scientific centres, institutes and colleges, and inter-sector studies are very limited.

Lastly, regional S&T and infrastructure investment is modest.

- Provincial investment in S&T in the Central Highlands is inadequate with low efficiency. There is a lack of appropriate mechanisms to attract social resources and businesses to invest in S&T. Currently, the Central Highlands has the lowest state budget allocation for scientific research, with just 0.76% being allocated between 2015 and 2019, rated only higher than the Northern Midlands and Mountainous area (Ha Dinh Thanh, 2020).

- Despite quantitative growth in S&T potential and qualifications, and the supply of human resources in the Central Highlands, they have yet to meet the qualitative requirements.

- Technical facilities and research equipment in the Central Highlands are still insufficient and inconsistent.

- The administration of S&T operations has yet to establish appropriate priorities, strategies, and solutions to achieve breakthroughs in those areas where the Central Highlands enjoys advantages.

- Expenditure norms and procedures for the settlement of S&T tasks and technology application and transfer projects practically have many shortcomings. There is also a lack of a reliable and synchronous regional statistical database on innovation and start-ups.

4.2. Causes of limitations

The causes for the limitations are mainly as follows:

Firstly, relevant supporting policies for innovation and application of new technologies are stated in various specialised legal documents. As a result, a matrix of intertwined policies and the situation of "abundant overlapping but lack coordination" make enforcement problematic (Ha Dinh Thanh, 2020).

Secondly, the Central Highlands has unfavourable conditions in terms of infrastructure, human resource qualifications, education and training, and budget revenue; consequently, it is challenging to implement policies and regulations due to a lack of necessary resources, and human resources as both a bottleneck and a major problem.

Thirdly, due to the inadequate awareness about the significance of science, technology and innovation, the efforts to overcome limitations in the organisation and implementation of research and applications of scientific and technological achievements are limited and passive, primarily reporting to the higher levels and waiting for solutions from the central government. There is little effort to adapt or change systems and policies at the local level,

and there is minimal advocacy for changes at national level that would better serve the local level requirements.

Fourthly, there are few exceptional initiatives and strategies to stimulate the invention and use of new technologies in conjunction with the specific advantages the Central Highlands is blessed with due to a lack of high-quality resources and mechanisms to promote the innovation spirit. Innovation must use an innovative and creative approach while avoiding stereotypes and administrative problems (Ha Dinh Thanh, 2020).

Fifthly, since the Central Highlands encompasses a sensitive political security area, it maintains a relatively closed policy to the outside world, particularly to FDI enterprises. Meanwhile, businesses are mainly small scale and concentrated in the fields of purchasing and preliminary processing of agricultural products, and the construction industry, which limits their technological competencies. The enterprises also have few opportunities to gain good experience from those areas or sectors with a greater capacity and more advanced technology and innovation. The spread of advanced knowledge and management skills is also limited in forming a modern industrialisation mindset based on science, technology, and innovation, particularly in the context of 4IR and digital transformation.

5. Conclusion and policy recommendations

The Central Highlands has made remarkable achievements in socio-economic development and poverty reduction during the 2011 to 2019 period. The economic structure has shifted from agriculture and forestry to an economy concentrating more on the industry and service sectors. In recent years, to support the improvement of the environment for innovation and application of new technologies, the government has made efforts to perfect both the mechanisms and implementation methods to enhance research capacity, transfer and application of S&T, and innovation of the whole country and the Central Highlands in particular. Innovation and new technology application achievements have demonstrate the importance attached to S&T. However, the Central Highlands is struggling to compete with other areas since the provincial business climate and competitiveness index have remained around the bottom of the rankings given the poor economic growth and slow S&T advancement. The level of science, technology, and innovation of the Central Highlands lags considerably behind the rest of the country. For the period 2021 to 2030, the following policy recommendations might be explored for science, technology, and innovation to become a significant driving force in renovating the development model associated with economic restructuring in the Central Highlands:

Firstly, the government, ministries and sectors provide special policies for innovation and the application of S&T to leverage the unique advantages of the Central Highlands. The policies should be developed based on the exploitation of the specific regional advantages, taking into account the implementation of new-generation free trade agreements and commitments in international economic cooperation agreements/treaties, particularly

policies to attract inter-regional investment; policies for the development of regional, inter-regional markets; mechanisms for the allocation of central resources to regional projects/programmes; establishment of a regional development fund and a regional governance model; mechanisms to encourage large companies to invest in the exploitation of the region's specific advantages; coordination mechanisms for short-, medium-, and long-term planning, and regional/local strategies.

Secondly, provinces in the Central Highlands must fully understand and promote the awareness of the role of science, technology, and innovation activities, as well as develop action plans to attract investment, particularly corporate funding, for science, technology, and innovation. There should be measures in place to ensure that the policies set by the provincial governments are smoothly executed in practice.

Thirdly, recommendations for the Central Highlands enterprises. Enterprises should implement strategies for investment in the research and development of technological-based businesses, including expanding R&D funds, linking and developing the S&T market to connect supply and demand of S&T products, establishing and promoting links between businesses and research institutes and universities in the Central Highlands in order for Vietnamese brands to produce high-quality products, and participate in the global value chain. Researchers also need to pay attention to looking at the needs of businesses so that research products can be marketable.

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